Research Article

Mobile Platform for MOCC Music Hybrid Teaching Based on Convolutional Neural Network

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With the wide application of Internet mobile devices in many industries, the hybrid teaching mode of online and offline has also become a research hotspot in the field of education. In the process of constructing the music online teaching platform based on mobile platform MOOC, the distribution of samples will affect the data recognition results of the system. Therefore, this paper uses convolutional neural network as the backbone network to extract data features and improve the resolution. At the same time, in the process of data compression, this paper realizes the global average pool and unified parameters by improving the attention mechanism, so that all parameters interact with their K adjacent parameter characteristics, so as to reduce the overdependence between channels and reduce the complexity of the overall calculation. For the analysis of complexity, this paper detects the time required for serial training and parallel training, intercepts the average value of the parameters of all nodes, and obtains the optimal number of nodes of this model. Finally, combined with the characteristics of music teaching, this paper designs a mobile MOOC music teaching platform based on convolutional neural network. The platform includes modules such as basic information management and music course resource construction and applies it to the actual music course teaching process. The performance of the algorithm and the feasibility of the system are verified by classroom activity test, hoping to provide some reference for the research in the field of music mixed education.

1. Introduction

Since the popularization of Internet and mobile communication technology, it has been more and more widely used in many fields, including the education industry [1]. Affected by the COVID-19, the pace of reform in the education industry has gradually accelerated. One of the innovations is MOOC online teaching with the help of Internet and mobile platform technology [2]. The traditional teaching mode can not meet the requirements of home-based learning during the epidemic. At the same time, there are some defects, such as single teaching mode and fixed teaching methods. With the development and application of intelligent teaching software based on mobile terminals, the emergence of online teaching system has added new learning means for students, which truly realized the acquisition of new knowledge at home and anywhere [3]. Students can also freely choose appropriate educational resources according to their preferences, which is conducive to the cultivation of personality [4]. However, there are still many deficiencies in the current online teaching system. Due to the lack of face-to-face communication between teachers and students, they cannot detect the actual learning situation of students in time and can not explain students’ questions in detail. Therefore, relying solely on the online teaching system can not achieve better teaching results. The mixed teaching mode of “Online + offline” has solved these problems to a certain extent and has gradually attracted extensive attention in the field of education [5].

MOOC not only makes it convenient for students to carry mobile devices to the classroom, but also ensures the actual learning effect with the help of mobile devices [6]. The online teaching platform represented by MOOC also has the teaching activities of offline classroom, including new course teaching, classroom tasks, teacher-student interaction, after-school homework, and learning notice. At the same time, it
also has the functions that offline classroom cannot realize in class, such as learning record, real-time test, and teaching feedback [7]. In addition, combined with the practicality and professionalism of music teaching, the online teaching system needs to realize stronger functions such as voice interaction, voice recognition, audio and video production and recording, and multimedia playback, which requires the online teaching system to realize these functions with the help of a variety of computer technologies [8]. The application of convolutional neural network can improve the recognition accuracy of massive training data, solve the problem of difficult model training, and realize the recognition task of large-scale samples [9]. The application in the design of online music teaching system on mobile platform can improve the operation efficiency of the system and improve the speed of model training [10]. Therefore, after analyzing the background of music mixed teaching, this paper puts forward the application and design of mobile platform MOOC teaching system based on convolutional neural network.

2. Related Work

The concept of mixed teaching is defined in the literature as follows: combining the advantages of traditional learning methods with the advantages of network learning, we should give full play to the guiding role of teachers as knowledge instructors and control the whole teaching process. We should also take students as the center and give full play to students’ subjective initiative as the main body of the classroom. Mixed teaching realizes the characteristics of the two teaching methods. The literature interprets MOOC as "online large-scale open courses," that is, a new teaching method with the characteristics of openness, large-scale, and online [11]. The literature mentioned that MOOC not only is a simple online video course, but also covers a variety of teaching resources, learning communities, student management systems, comprehensive evaluation systems, and other teaching means [12]. It is a digital form of offline courses. The literature emphasizes that MOOC is different from the general teaching method and adopts the form of networking and informatization [13]. Therefore, in the course design, we need to consider the characteristics of the network platform, and the user’s computer operation ability is also one of its influencing factors. According to the literature, in addition to providing free online teaching resources, MOOC also has the function of managing large-scale learning users [14]. It can realize thousands of people’s online learning, examination, test, and interactive communication at the same time, which can not be realized in the traditional classroom. At the same time, it is also the biggest feature that MOOC is different from the general classroom. The importance of MOOC is explained in the literature. It is believed that the online teaching platform with MOOC as the main form has realized remote teaching, created a new teaching mode, and truly promoted the dissemination of knowledge. Many scholars have questioned this teaching method. For example, the literature believes that online teaching systems should be carefully selected and used, especially for the courses of primary and secondary school students. The literature suggests that we should rationally treat online teaching methods such as MOOC, not blindly follow, let alone try to replace offline teaching methods [15]. We should combine the two and carry out mixed teaching. Through the research on MOOC and microcourses in the literature, it is considered that, at this stage, online teaching can only be used as an auxiliary way of professional teaching, and offline teaching should still be the main teaching method. Especially with regard to the practical application of online teaching platform, the literature believes that the development of computer and Internet technology at this stage can not meet the needs of large-scale online teaching, so the hybrid teaching mode of online and offline combination is particularly important [16].

In order to further improve the reliability of online teaching platform, the literature studies the effectiveness of students’ evaluation function of online teaching platform by collecting the data of multiple MOOC platforms and using data analysis software. Experiments show that the online teaching platform can effectively grasp students’ learning situation, and the function of students’ mutual evaluation can also reflect students’ learning achievements to a certain extent [17]. The operation of online teaching platform is inseparable from the development of computer technology. For example, the literature introduces the advantages of convolutional neural network and other algorithms in system target recognition, especially with the continuous improvement of the accuracy and real-time of convolutional neural network target detection algorithm, which greatly promotes its application in many fields [18]. Combined with the characteristics of music teaching, there are high requirements for the recognition of voice and video resources. It is mentioned in the literature that, compared with other computer algorithms, the speech recognition technology based on deep learning can extract features through the training of a large amount of data. In contrast, this method can improve the accuracy and accuracy of recognition. At the same time, it is also relatively simple and feasible in model construction. The literature shows that the convolutional neural network under the deep learning framework has strong network weight sharing characteristics, which can reduce the weight parameters required by the network in the system, so as to improve the performance of the whole network system and improve the accuracy of speech and image recognition. This is very important for music teaching system. In addition, in the research of music teaching, the literature mentioned that the existing music education in colleges and universities has different degrees of disadvantages, such as insufficient informatization, relatively closed teaching environment, and single teaching equipment. These problems can be solved through the Internet and computer technology, especially the application of online teaching methods such as MOOC. This is also one of the research focuses of this paper.
3. Research on Convolutional Neural Target Recognition for Mobile Terminals

3.1. Basis of Convolutional Neural Network. Compared with the traditional recognition methods, convolution neural network algorithm can distinguish the target faster in many training data and extract the data features of the image, mainly including convolution layer, pooling layer, activation layer, full connection layer, and batch normalization layer.

3.1.1. Convolution Layer. Suppose that the coordinates of the recognition target channel are \((i, j)\), the size of the convolution kernel is \(m \times n\), and the weight of the convolution kernel is \(\omega\). Image brightness is \(v\). The forward propagation process of the image through the convolution layer is shown in

\[
\text{Output}_{x,y} = \sum_{i} \omega_{i} v_{i},
\]

where

\[
\text{Output} = \frac{(\text{map}_{\text{size}} - \text{kerner}_{\text{size}} + 2 \times \text{padding})}{\text{stride}} + 1.
\]

3.1.2. Pool Layer. In order to ensure that the edge information of the sample can be fully utilized, the filling operation will be used to roll up the layer. The output result is shown in

\[
\text{Output} = \frac{(\text{map}_{\text{size}} - \text{kerner}_{\text{size}} + 2 \times \text{padding})}{\text{stride}} + 1.
\]

3.1.3. Active Layer. The activation layer is to activate the function to ensure the nonlinearity of the network and make the detection target more accurate and specific. Among them, the neural network can use sigmoid as the activation function, and the output expression is as shown in

\[
\sigma(x) = \frac{1}{1 + e^{-x}}.
\]

Meanwhile, the output expression of tanh is

\[
tanh(x) = \frac{1 - e^{-2x}}{1 + e^{-2x}}.
\]

The common feature of sigmoid and tanh is that when the input is large or small, the gradient is almost 0. In order to avoid this situation and improve the network speed, this paper adopts the commonly used activation function relu, and its output expression is

\[
\text{ReLU}(x) = \max(0, x).
\]

3.1.4. Full Connection Layer. The full connection layer is mainly to provide different detailed feature recognition results for the convolution layer and reduce the error caused by feature position offset to feature classification. In fact, the full connection layer can also be said to be a data classifier.

3.1.5. Batch Normalization Layer. The batch normalization layer is usually used after the convolution layer. Firstly, learnable parameters are introduced \(y\) and \(\beta\). Define the batch input data and calculate its mean value, as shown in

\[
\mu_{B} = \frac{1}{m} \sum_{i=1}^{m} x_{i}.
\]

The variance of the data is

\[
\sigma_{B}^{2} = \frac{1}{m} \sum_{i=1}^{m} (x_{i} - \mu_{B})^{2}.
\]

Then standardize this part of data, and the result is shown in

\[
\hat{x}_{i} = \frac{(x_{i} - \mu_{B})}{\sqrt{\sigma_{B}^{2} + \varepsilon}}.
\]

With learnable parameters \(y\) and \(\beta\), and normalized output, the final result is

\[
y_{i} = y \hat{x}_{i} + \beta.
\]

3.2. Improved Attention Mechanism. As mentioned earlier, in order to ensure that the edge information of the sample can be fully utilized, the filling operation will be used to roll up the layer. At the same time, the method of global average pooling will be adopted in the process of data compression; that is, the global spatial information compresses the nonlocal information. Its expression is as follows:

\[
Z_{C} = F_{sq}(u_{c}) \frac{1}{H \times W} \sum_{i=1}^{H} \sum_{j=1}^{W} u_{c}(i, j).
\]

Next, in order to obtain the correlation between different channels, the method of expanding channels is adopted, as shown in

\[
S = F_{ex}(z, W) = S(g(z, W)) = S(W_{z}d(W_{z}z)).
\]

In the local communication module, the expression method of channel weight is shown in

\[
\omega = s\left(f_{[w]}g(c)\right).
\]

Let \(W\) be the width of the model feature, \(H\) be the height, and the channel parameter set \(G(x)\) be

\[
g(x) = \frac{1}{wh} \sum_{i=1, j=1}^{w, h} x_{i, j}.
\]

The features after regularization are

\[
f_{[w]} = \text{ReLU}(wx).
\]

Formula (14) shows that this linear model is predictable. Therefore, the characteristic information of a parameter \(Y_{i}\) and \(K\) adjacent parameters are interacted, and the result is shown in


\[ w_i = s \left( \sum_{j=1}^{k} w_i^j y_j^i \right). \]  

(15)  

In order to unify the parameters, all parameters are interacted with the characteristic information of \( K \) adjacent parameters:

\[ \omega_i = \sigma \left( \sum_{j=1}^{k} \omega_i^j j^j \right). \]  

(16)  

Although the improved attention mechanism increases the complexity of part of the time, on the whole, the spatial complexity is greatly reduced because of the interaction of \( K \) channel feature information, which improves the overall performance of the system.

3.3. Time Complexity Analysis of Serial Training and Parallel Training. For the analysis of complexity, this paper detects the time required for serial training and parallel training and interprets the average value of local parameters of all nodes, that is,

\[ \left( W_{\text{out}}^{\text{d}}, b_{\text{out}}^{\text{d}} \right) = \left( W_{2,\text{out}}^{\text{d}}, b_{2,\text{out}}^{\text{d}} \right) + \cdots + \left( W_{n-1,\text{out}}^{\text{d}}, b_{n-1,\text{out}}^{\text{d}} \right) / (N-2). \]  

(17)  

BP neural algorithm is divided into three stages: forward propagation, backpropagation, and parameter update. Suppose the total number of training samples is \( a \), the number of training is \( B \), and the hidden layer 1 contains three layers of neural networks, \( n_1, n_2, \) and \( n_3 \), respectively. The time used for point multiplication is \( T_m \) the time used for addition is \( Ta \), and the time used for activation value is \( T_{ac} \). The forward propagation time of a sample is

\[ t_1 = (n_1 n_2 t_m + n_2 t_a) + (n_2 n_3 t_m + n_2 t_a + n_3 t_{ac}) = n_2 (n_1 + n_2) T_a + t_{ac} (n_2 + n_3). \]  

(18)  

Of that,  

\[ T_a = (t_m + t_a). \]  

(19)  

The time required for backpropagation is about

\[ t_a = n_2 n_3 T_{ac}. \]  

(20)  

The time required to update the parameter matrix between the three-layer neural networks is about

\[ t_3 = n_2 (n_1 + n_3) T_{ac}. \]  

(21)  

The duration of serial training is

\[ T_{ser} = AB(2 n_1 + 3 n_3 + n_2 + n_3) t_{ac}. \]  

(22)  

Set  

\[ \beta = 2 n_1 + 3 n_3 + a. \]  

(23)  

Then,

\[ T_{ser} = AB(\beta n_2 + a n_3) T_a. \]  

(24)  

Assuming that there are \( n \) data nodes and each node is equally divided into \( N/A \) samples, the training duration of each single node is

\[ t_{par,\text{d}} = A/n (t_1 + t_2 + t_3) = A/n (\beta n_2 + a n_3) T_a. \]  

(25)  

The algebraic sum of training time is

\[ T_{par,\text{d}} = A/n B(t_1 + t_2 + t_3) = AB/n (\beta n_2 + a n_3) T_a. \]  

(26)  

Finally, the time result of parallel training batch BP algorithm is as follows:

\[ T_{par} = T_{par,\text{d}} + n T_{com} = AB/n (\beta n_2 + a n_3) T_a + n T_{com}. \]  

(27)

4. Design and Implementation of the Music Teaching System Based on Mobile Platform MOCC

4.1. Overall System Architecture. This system adopts Java EE framework structure and Android client. The system is divided into three layers, including function presentation layer, business logic layer, and data layer. The system architecture is shown in Figure 1.

The functional expression layer of the system covers the core functions, mainly including basic information management, online classroom management, and so on. The business logic layer includes the basic permission setting, query setting, and system configuration of the system. The data layer is mainly the database management of the system, which is an important part of the system. The functions of each server are independent and interconnected to jointly maintain the integrity and scalability of the system.

Combined with the characteristics of music teaching, the online intelligent teaching system designed in this paper focuses on the mobile platform technology, covers all links of offline teaching, and adds intelligent lesson preparation and teaching reflection links. The overall function of music teaching platform is shown in Figure 2.

The music teaching mode of mobile platform is the same as offline teaching, including three links before, during, and after class. Among them, teachers are assisted in intelligent lesson preparation by means of intelligent push of teaching resources before class. The links in the course include using the online teaching platform for real-time interaction, monitoring the teaching process, recording students’ learning data, and timely learning situation analysis. The after-school link mainly aims at students’ learning situation, provides personalized guidance for students, and carries out intelligent reflection teaching. The realization of the whole teaching process needs the technical support of mobile platform and the provision of adaptive resources to ensure the stable operation environment of the system.
4.2. Design of the System Database Table. The design of database table is an important part of system physical design. In the construction of mobile platform music teaching system, the database table design of this paper mainly includes student information table, course information table, music resource information table, consultation information table, daily notice information table, and attachment information table. This chapter selects some tables to describe the main fields.

4.2.1. Student Information Form. The student information table is mainly used to store the basic information of students, such as name, student number, gender, and other information. The specific field description is shown in Table 1.

4.2.2. Course Information Sheet. The course information table is mainly used for students’ course related information, such as semester, course name, major, teacher, and other information. The specific field description is shown in Table 2.

4.2.3. Music Resource Information Table. Music resource information table is mainly used to store the information of music video, audio, and other resources on the course.
system, such as the name, type, upload time, uploader, and other information of music. The specific field description is shown in Table 3.

4.2.4. Music Information Table. The information table is mainly used to store the music related information released in the teaching system and assist teachers in teaching, such as information category, release time, specific content, number of visitors, and other information. The specific field description is shown in Table 4.

4.2.5. Daily Notice Information Form. The daily notice information table is mainly used to store the relevant notice information released by teachers in music online courses, including the arrangement of various teaching links. The database table mainly describes the notice title, notice content, release time, publisher, and other information. The specific field description is shown in Table 5.

4.2.6. Annex Information Sheet. The attachment information table is used to store the attachment information of documents related to students’ works, including course assignments and works. The database table mainly describes the name, style, upload time, and other information of works. The specific field description is shown in Table 6.

4.3. Analysis of Simulation Experiment Results. In this paper, the training time of a single node is calculated by BP neural algorithm, and the data complexity of the system is analyzed. In order to further obtain the optimal number of nodes of the system model, the training efficiency under different number of nodes is calculated, and the results are shown in Figure 3.

As can be seen from Figure 3, there is little difference in the recognition rate when the number of nodes is 4, 6, and 8, and the stable recognition rate can be reached faster than serial training. At the same time, when the number of nodes is 4 and 8, the training time is more than when the number of nodes is 6, which verifies that the optimal number of nodes of the system model is 6. According to the analysis of the actual situation of the system, this result is mainly because the training efficiency of the system can reach the optimal saturation state when the number of nodes is 6. Therefore, in this case, the increase or decrease of the number of nodes will only increase the identification time of the system and reduce the operation efficiency. The optimal number of nodes is determined according to the characteristics of the system model, the amount of data, and the performance of hardware facilities. Therefore, the optimal number of nodes of different systems will also vary greatly.

In addition to the basic system performance, this paper also tests the basic performance of the login and discussion function module of the online music teaching system. The results are shown in Figures 4 and 5.
### Table 3: Music resource information.

<table>
<thead>
<tr>
<th>Field description</th>
<th>Field identification</th>
<th>Field type</th>
<th>Size</th>
<th>Allow to be empty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music resource ID</td>
<td>Id</td>
<td>Long</td>
<td>20</td>
<td>N</td>
<td>Primary key</td>
</tr>
<tr>
<td>Music name</td>
<td>Music</td>
<td>Varchar</td>
<td>32</td>
<td>N</td>
<td>—</td>
</tr>
<tr>
<td>Music</td>
<td>Type</td>
<td>Int</td>
<td>2</td>
<td>N</td>
<td>—</td>
</tr>
<tr>
<td>Belong to the country</td>
<td>Country</td>
<td>Varchar</td>
<td>16</td>
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<td>—</td>
</tr>
<tr>
<td>Profile</td>
<td>Introduction</td>
<td>Varchar</td>
<td>32</td>
<td>Y</td>
<td>—</td>
</tr>
<tr>
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<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Publisher</td>
<td>FBR</td>
<td>Varchar</td>
<td>10</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Information content</td>
<td>ZXNR</td>
<td>Varchar</td>
<td>2000</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Number of viewers</td>
<td>ZLRS</td>
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<td>20</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
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</tr>
<tr>
<td>Remark</td>
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### Table 4: Information table.

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<td>Music information number</td>
<td>YYZXHB</td>
<td>Integer</td>
<td>20</td>
<td>N</td>
<td>Primary key</td>
</tr>
<tr>
<td>Information title</td>
<td>ZXBT</td>
<td>Varchar</td>
<td>50</td>
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</tr>
<tr>
<td>Information category</td>
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<td>—</td>
</tr>
<tr>
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<td>Datetime</td>
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<td>—</td>
<td>—</td>
</tr>
<tr>
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<tr>
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<td>BZ</td>
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### Table 5: Daily notification information.

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</tr>
<tr>
<td>Remark</td>
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### Table 6: Attachment information table.

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</tr>
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</tr>
<tr>
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<td>SFTG</td>
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<td>0-Unparalleled; 1-pass</td>
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<td>BZ</td>
<td>Varchar</td>
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Figure 3: Training efficiency under different number of nodes.

Figure 4: Visits.

Figure 5: Score statistics.
4.3.1. Visits. During the test, the total number of visits to the system was 947, and the overall login success rate could reach 87.8%. Combined with the actual music online course arrangement, the system achieved the expected effect. Figure 4 extracts the statistics of platform visits within 1 minute.

4.3.2. Discussion Activities. In order to further test the effectiveness of the music teaching system, this paper launched a discussion activity on the platform according to the learned knowledge and made statistics on the classroom discussion results. A total of 266 discussion results were submitted by students. Taking 10 points as the statistical standard, it is qualified if it is higher than 6 points. The results are shown in Figure 5. The overall qualified rate reaches 92%, which can prove the learning effect of students’ online classroom and the effectiveness of music teaching system to a certain extent.

5. Research on the Application Strategy of the Music Mixed Teaching Mode under Mobile Platform

5.1. Main Forms of the Mixed Teaching Mode. In the traditional music classroom, the teaching method of “teachers sing and students learn” and “teachers talk and students listen” ignores the subjective initiative of students as the main body of the classroom. In the process of online MOOC teaching, teachers and students have an equal dialogue relationship. Students can raise their own questions in time. Teachers can timely understand students’ learning through the data collected by the online learning system. Therefore, mixed teaching combines the advantages of online and offline teaching methods and makes up for the shortcomings of single teaching mode. For music teaching, the advantage of offline teaching mode is that students can directly follow the rhythm of teachers in class to connect pronunciation and singing. The disadvantage is that they cannot give feedback about the learning results to teachers in time. The advantages and disadvantages of online teaching are just the opposite. Students can submit their own learning results, but they can not communicate face-to-face with teachers for voice practice, etc. Mixed teaching combines the advantages of the two teaching modes. Therefore, it also requires teachers to change their teaching ideas in time, give full play to the advantages of online and offline teaching, and build three teaching stages of organic connection between preclass guidance, in class promotion, and after-school supervision, so as to design a mixed teaching mode that is more conducive to the development of students.

The mixed teaching mode is a combination of online and offline teaching modes, but online teaching is not a rigid copy of the traditional offline teaching mode. There are some commonalities and differences between them. The specific differences are shown in Table 7. Hybrid teaching organically integrates the places, knowledge transfer forms, educational approaches, advantages, evaluation methods, and teaching resources of online and offline teaching methods, realizes the way of face-to-face interaction, and can also timely grasp the students’ learning after class with the help of the data of MOOC system. The online system can still be realized with the help of whiteboard, multiscreen interactive software, multimedia, and other information-based teaching tools. Students can conduct cooperative exploration in the online discussion area of the course and can watch the previous learning resources repeatedly after class.

5.2. Design of the Mixed Teaching Mode in the Mobile Platform Environment. In the context of the normalization of the epidemic, major universities have accelerated the construction of online courses, so many high-quality online course resources have been born. Under the mixed teaching mode, these teaching resources are required to be organically integrated. For example, schools can compile high-quality mixed teaching cases and establish a teaching material library. Teachers can also be organized to develop school-based resources and develop school question bank and teaching resource package according to the requirements of standardization and digitization. At the same time, with the help of the construction of online teaching platform, promote teachers’ microcourse recording and online course construction, and form a school level professional course system with intellectual property rights. In the mixed teaching environment based on MOOC, network curriculum resources are one of the basic guarantees for its smooth implementation. Teaching materials are not the only teaching reference for teachers. The large number and variety of network resources can provide diversified support for the mixed teaching model. It is more conducive to the personalized cultivation of students.

In the process of mixed teaching, the data related to learning can be collected, monitored, and analyzed with the help of computer platform, and a relatively objective and fair evaluation can be obtained. At the same time, the cumulative learning results of students can be continuously recorded with the help of big data platform, including the participation degree of teaching activities, check-in times, test results, and homework completion and finally generate a relatively complete evaluation system according to different proportions. At the same time, teachers and students can become the main body of evaluation and being evaluated. The number of visits to the learning platform, the repeated viewing rate of teaching videos by learners, and the frequency of course interaction can reflect the level of teachers’ curriculum design to a certain extent and can be used as one of the indicators of teachers’ online curriculum evaluation. In addition, the online teaching platform also has the function of students’ mutual evaluation, which can also reflect the learners’ mastery of the knowledge.

5.3. Building an Integrated Intelligent Campus Platform. With the help of Internet and mobile communication technology, we can not only realize the mixed teaching mode, but also build an integrated intelligent campus management platform to realize intelligent management of the whole campus and student groups. The learning results of students’ online courses can be used as one of the
indicators of students’ comprehensive evaluation. Data collection can use a variety of computer technologies, especially big data, cloud computing, and other technologies to achieve more efficient and accurate statistics. At the same time, through the collection of intelligent teaching platform data, we can also understand the teaching situation of teachers and the evaluation results of students, which can assist the school in education and teaching management. The integrated intelligent campus platform is conducive to the organic integration of the whole school resources and can provide convenient and comprehensive campus services for teachers and students.

6. Conclusion

In the context of the Internet, the traditional classroom is gradually undergoing great changes. Especially in recent years, affected by the COVID-19, the reform speed of the education industry is gradually accelerating. The existing teaching model can no longer meet the diverse needs of students. Mixed teaching combines the advantages of the two teaching models. Therefore, the emergence of mixed teaching model has quickly become a research hotspot in the education industry. Based on the existing research on mixed teaching mode, aiming at the problems of low interactivity in traditional music teaching classroom, students’ learning results after class can not be monitored in time, and traditional teaching mode can not meet the requirements of home learning during the epidemic; with single teaching mode and fixed teaching methods, combined with the development background of mobile platform MOOC, this paper constructs a music online teaching platform based on convolutional neural network. It mainly includes modules such as basic information management and music curriculum resource construction, which are applied to the actual music curriculum teaching process. The performance and feasibility of the system algorithm in this paper are verified by auxiliary classroom assessment and other links. Through this research, this paper puts forward the design of mixed teaching mode under the environment of mobile platform, hoping to provide some new ideas and methods for the research in the field of music mixed education.

Data Availability

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

Table 7: Comparison between MOOC music class and traditional music class.

<table>
<thead>
<tr>
<th>Place</th>
<th>Intellectual</th>
<th>Way</th>
<th>Advantage</th>
<th>Evaluation method</th>
<th>Interactive</th>
<th>Education resources</th>
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<tr>
<td>Face</td>
<td>Offline</td>
<td>Web lesson</td>
<td>Hybrid teaching</td>
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<tr>
<td>Online</td>
<td>Flow + integration</td>
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<td>Relatively static</td>
<td>Autonomous learning, online discussion</td>
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</tr>
<tr>
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<td>Abundant resources</td>
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Conflicts of Interest

The author declares no conflicts of interest.

References


