Exploration of Reform and Development Countermeasures of Music Education in the Context of Big Data Education Culture

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Abstract: Practicality is the focus and difficulty of the current school teaching reform. The practical teaching reform of music education in universities has lasted for more than ten years, and the effect is obvious, but there are also some problems. Based on the environment of big data, the article expounds the problems encountered in music education, solutions and strategies. Specifically, the author conducts research by introducing three typical big data processing methods. For the reform of music education, practical teaching is an indispensable and important part. The prediction results show that the prediction performance based on the elite particle immune algorithm is the best, and it can be recommended as the main research method in the later stage to be applied in the process of music teaching reform in China.

Keywords: Big Data Environment; Musical Education; Development Strategy; Practical Teaching Mode

1. INTRODUCTION

Music education (Lukács & Honbolygó, 2019; Nieuwmeijer et al., 2019) is an important component of college education and the main embodiment of quality education. With the comprehensive development of my country's economy, culture, technology, etc., it is the general trend and imperative to cultivate compound high-quality music talents that meet the needs of social development. Music teachers should not only scientifically change teaching concepts and constantly innovate teaching methods, but also actively develop and apply scientific music teaching resources, so as to ensure that the reform of music education in universities keeps pace with the times. Based on this, this paper analyzes the specific points of the music education reform in universities in the new era, and focuses on the feasible reform methods, so as to provide a guarantee for promoting the sustainable development of the music education reform in universities. The goal of music education reform in universities is to promote the all-round development of college students, improve their professional skills and

comprehensive quality, and help college students grow into the compound talents needed by the development of the current era (Freeman & Glushko, 2019; Poblete et al., 2019). College students continue to accumulate music knowledge in college music courses, improve their aesthetic ability, and form a healthy learning mentality, which is not only the needs of college students themselves, but also the fundamental task of college music education. Based on this, it is an inevitable trend for the development of higher education to attach importance to the reform of music education in universities, and it is also an inevitable path to help college students improve their personality and will. However, a closer look at the current situation of music education in universities shows that there are many problems in music education in most universities. One of the reasons is that in the previous education stage, college students, teachers, and parents did not pay attention to music education, and the basic level of college students' music was uneven. Second, because trend music has a great influence on college students, many college students tend to express superficial music, and they are unwilling to actively learn and master classical music and folk music, which directly interferes with the promotion of music education reform in universities. At present, the teaching equipment and facilities of music education in most universities in my country are relatively backward (Burak, 2019; Mawang et al., 2019), not updated in time, and no longer meet the music learning needs of contemporary college students. For example, in college music classes, although music teachers often use multimedia equipment and various audio-visual equipment to play music teaching materials for college students to help college students broaden their music learning horizons and effectively broaden their music learning knowledge. However, to ensure that the modern teaching equipment used by teachers is scientific and efficient, the facilities and equipment themselves are required to be advanced and complete. The reality is precisely not. The enrollment plan of art students in most universities in China is constantly expanding, but the corresponding educational resources are not matched with it, and the teaching situation is increasingly "contradictory", which is reflected in the teaching equipment and facilities of music education. That is, both the quality and quantity of teaching equipment and facilities required for music education are relatively lacking. In the long run, the music education curriculum is different from other departments and majors, and it cannot make college students truly feel the charm of music learning. The overall efficiency of systematic music education is reduced, and the development of music teaching is difficult. Professional music teachers are the basic

premise of music education in universities (Krupp-Schleußner & Lehmann-Wermser, 2018; Ruiz, 2018). If music teachers cannot play a key role in music teaching courses, then the development of music education in universities will inevitably be ineffective. But at present, the professional music teacher resources in most universities in my country are very scarce, which leads to a surge of teaching pressure on existing music teachers. That is, bound by traditional educational concepts, some university leaders have not really implemented the educational concept of "cultivating morality and cultivating people", resulting in a shortage of professional music teachers in schools. In the actual music teaching, the phenomenon of "part-time teaching" generally exists. For example, some music teachers in universities are not only responsible for the teaching of professional courses for students majoring in music, but also for hundreds of undergraduates in other majors in basic theory-based open music courses. Even though the curriculum at the university level is relatively easy compared to the previous stage, the teaching energy of music teachers is limited after all. Too many curriculum settings will only make music teachers tired, which will affect the teaching of music majors, and is not conducive to the improvement and innovation of music education. At the same time, with the continuous progress of the social economy and the continuous improvement of the teaching level, universities strive to vigorously promote the teaching reform, and put forward more and higher requirements for the professional growth practice of music teachers. But music teaching is different from other courses. It has certain abstraction and particularity. Teachers and college students must go through a long period of "quantitative" change in teaching and learning to produce "qualitative" change. Therefore, there is a certain one-sidedness in the regular assessment of music teachers, resulting in increased pressure on music teachers. Overall, the quality of college students has declined. As the name implies, it means that even if contemporary college students are admitted to the major of music and art, they are not very interested in learning music knowledge, and they are more like a kind of coping with learning. In other words, college students lack understanding and perception of music knowledge, and the internal factors of learning are very insufficient. On the one hand, under the background of the new curriculum reform, many universities have liberalized the enrollment ratio of art students, and the enrollment scale of music majors has continued to expand. However, with the continuous increase in the number of students enrolled, the actual quality of college students recruited is uneven, and the development of music teaching activities has been affected, and the overall

quality of college students has gradually declined. As a result, the development of music education in some universities is affected by the traditional teaching mode, and college students cannot realize the importance and necessity of music learning for their lifelong learning and development. Therefore, their participation in music theory learning and music practice "becomes optional", which directly increases the teaching burden of music teachers. If the music teacher fails to establish an effective and harmonious communication relationship with the college students when carrying out music teaching activities, the music teacher's music teaching will be more than enough (Nan et al., 2018; Ruddock, 2018). Over time, music teachers are unable to devote more time and energy to the college students they lead, which seriously hinders the progress of teaching. In the process of continuous advancement of the new curriculum reform, music education in universities must also make corresponding innovations in order to effectively ensure the sustainable development of music education (Agaronnik, 2018; Howard, 2018). However, from a closer look at the specific music course teaching situation, it can be found that the scope of music teaching for some music teachers is still dominated by music teaching materials, and it is precisely the flexible construction of music teaching materials that is the weakest link in the reform of music education in universities at this stage. Therefore, it is difficult to achieve the teaching goal of music education reform in universities. In other words, in the traditional teaching mode, most universities choose course materials for professional music schools. In the traditional teaching mode, most music teachers will incorporate some novel teaching methods when carrying out music teaching activities (Isbell & Stanley, 2018; Petersen, 2018). However, due to the problems of music teachers' own teaching level and teaching experience, some music teachers have insufficient application of advanced teaching methods. For example, some young music teachers in universities do not have the ability to control the rhythm of classroom teaching, and they lack the use of information-based teaching methods and game-based teaching methods, resulting in poor innovation in music teaching methods and poor student learning. In addition, there is clearly a teaching problem in most young music teachers' classrooms. Because they have just joined the education work, the age gap between them and the students they bring is not too big. If the distance between themselves and students is not properly grasped at the beginning of teaching, students will have a casual and sloppy learning attitude when they formally take music lessons, and lack the sense of reverence for music teachers. To sum up, we can attribute the problems encountered in the current music education

reform to the following points. They are the slightly backward facilities and equipment of music education, the relative lack of professional music teachers, the decline in the quality of college students as a whole, and the lack of scientific and systematic construction of music teaching materials. The specific problem distribution is shown in Figure 1. As shown in Figure 1, the problems of the current music education reform are mainly reflected in various aspects such as the low quality of students, the lack of teaching equipment, and the lack of teaching resources.



Figure 1: Various Problems Encountered in Music Education Reform

Under the background of quality education, universities should actively strengthen the application of new media in music education and teaching, break the shackles of traditional teaching concepts and models, create a platform for students to show their individuality and display their fully mobilize students' subjective initiative. specialties, and Bv communicating with students, we will provide targeted guidance to students, deepen students' understanding of music knowledge and emotions, cultivate students' music perception and aesthetic ability, improve students' artistic accomplishment, and achieve comprehensive development of students' comprehensive quality. Constrained by outdated teaching concepts and the teaching ability of music teachers in universities, the integration of quality education and music education is not deep enough. Teachers and students lack emotional communication, and teachers do not reveal the essence of music education to students. Both theoretical teaching and practical training are far from meeting the requirements of music education, which has a negative impact on the individual development of students. The organic integration of quality education and music education is an important direction of teaching reform. We should transform from traditional mechanical teaching to organizing flexible and diverse teaching activities, carefully designing teaching content, and guiding students to learn to analyze the connotation and emotion of musical works. In addition, students should be encouraged to express their thoughts bravely, carry out innovative practice boldly, stimulate students' enthusiasm for learning, and enhance students' musical perception and creativity. Only such students are in line with the basic positioning of talents in the industry market in the new era, and their future development prospects are limitless. Among them, the big data method (Kim & Wang, 2019; Salloum et al., 2019), as a new type of application technology, has been applied and developed to a certain extent in the reform of music education. In order to allow readers to grasp the context of the article more clearly, the author expresses the writing trajectory of the manuscript as follows. In the second section of the article, the author introduces effective ways to reform Chinese music. The third section introduces several commonly used big data processing methods. Finally, a specific example of music teaching practice is expounded.

2. EFFECTIVE WAYS AND METHODS FOR THE REFORM AND DEVELOPMENT OF MUSIC EDUCATION

Combining the above analysis and clarifying the problems existing in the reform of music education in universities at this stage, the reform of music education in universities in the new era must follow the "student-based" principle, meet the needs of students in music learning, and integrate the content of music knowledge that students are interested in. Based on the specific requirements of music teaching reform in universities, universities should fully tap the practical advantages of integrating scientific music education content and teaching resources, and improve teaching quality in a step-by-step manner. The purpose of education reform is to cultivate the comprehensive quality of music learning of college students and to continuously improve the overall level of music education in universities. The reform of music education in universities under the background of quality education reform in the new era should pay attention to one point: scientific attention to the construction of music teaching materials (Gorbunova & Mikhutkina, 2020). At present, the main teaching content of music education in universities is the teaching of music theory knowledge, and the theory and practice are not organically integrated. Under the guidance of such music teaching materials, it is very unfavorable for students to improve their music literacy and comprehensive level. Therefore, schools and music teachers must pay attention to and attach importance to the construction of music teaching materials, and start with the optimization of teaching materials to provide a guarantee for the reform of music education. The application of the MOOC model in music teaching in universities can promote the sharing of teaching resources and allow students to come into contact with more excellent music works and feel the emotion of music. This educational model can immerse students in the artistic conception of music, thus plucking the heartstrings of students, turning passive into active, and improving students' musical literacy. Music knowledge is relatively abstract and involves a lot of theoretical content, which is not very attractive to students, and few students are willing to spend a long time on learning. The lack of musical knowledge reserves will affect students' mastery of the inherent characteristics and aesthetic concepts of different musical styles in the future, and students' understanding of musical works will be deviated accordingly. In this regard, college music teachers need to simplify theoretical knowledge, introduce vivid and vivid cases, integrate teaching content with modern information technology, enrich teaching courseware elements, and strengthen the visual effect of teaching courseware. The teaching content can be published on the online teaching platform, allowing students to freely arrange study time according to their own needs and formulate personalized study plans. Music knowledge will be effectively imparted to the majority of students. Compared with indoctrination teaching, the application effect of MOOC teaching mode is undoubtedly better. Because students have more channels and platforms to contact music works, their ability to discriminate between elegant and vulgar works is poor. Therefore, music teachers in universities should give full play to their guiding role and publish more music works with mature styles, unique styles, healthy aesthetic tastes, and positive thoughts on the MOOC platform. Teachers should let students know which musical works are worthy of admiration and which ones should be resisted, so as to cultivate students to form a scientific and sound view, and stimulate students' infinite passion for study and life. The MOOC platform has become a new frontier for college students to learn music courses. Complicated and cumbersome music knowledge is compressed into short videos, allowing students to selectively study according to their own interests and literacy. This teaching mode can thoroughly consolidate the

theoretical foundation of music, correctly interpret the connotation of music works, and enhance the professionalism and interaction of music teaching. Using the MOOC platform to implement music teaching remotely can completely record the students' learning information. Teachers have a clear understanding of the students' music learning status, constantly optimize the teaching content and teaching form, and are committed to creating an intelligent and open music classroom to escort the cultivation of students' music subject quality. Figure 2 shows the application of the MOOC platform by undergraduates, postgraduates and doctoral students in a music university in China. As shown in Figure 2, the proportions corresponding to different educational backgrounds are different. Among them, the proportion of undergraduate students is 30%, while the proportion of doctoral and master students is 35%.



Figure 2: The Application of MOOC Platform by Students of Various Degrees

The flipped classroom, as its name implies, subverts the original classroom teaching mode, closely links pre-class preview, in-class learning, and after-class reflection, and builds a complete music education and teaching system. It breaks through the problems of low efficiency of music teaching in universities and students' lack of enthusiasm for learning. The scientific design of the flipped classroom teaching process focuses on strengthening the connection of each link and monitoring the students' learning throughout the process. As shown in Figure 3, the flipped classroom teaching and after-class reflection. As shown in Figure 3, the process of music education reform mainly includes three stages: before class, during class and after class. Among them, the pre-class preview is the object that should be paid attention to in the education reform.



Figure 3: The Important Components of the Flipped Classroom

In the course of classroom teaching, teachers should analyze the feedback from students in detail, summarize the questions submitted by students, and determine the focus of this music lesson. In addition, teachers should also arrange students with common questions into a group, adopt a hierarchical teaching model, guide students to discuss in the group, and guide students patiently. The use of this teaching mode is committed to promoting students to learn to analyze and solve problems, and broaden their knowledge of music. In the after-class reflection session, music teachers in universities should evaluate students' mastery of music knowledge, remind students to check and fill in omissions in time, and strengthen autonomous learning, so that students' music knowledge reserves will become more and more abundant, and their knowledge application ability will be improved accordingly. First of all, students should be organized to conduct self-evaluation and self-reflection, sort out their own gains and shortcomings, and analyze why the learning efficiency is low. Secondly, teachers should organize students to carry out mutual evaluation, so that students can achieve the purpose of common progress and improvement in the process of mutual evaluation. Finally, based on the performance of the students in the music classroom, teachers find the existing shortcomings of the teaching process, improve and optimize the music teaching process, highlight the key points of teaching, and prevent the recurrence of similar bad situations, so as to truly play the role of flipped classroom in improving the quality of music teaching. In addition, the practical teaching of music is an essential part of the curriculum experience. The learning of music knowledge is ultimately applied to music practice activities. That is, we should use the knowledge we have learned to analyze musical works, sing songs, and play musical instruments, so as to improve students' core literacy of music disciplines. The key to achieving

this goal is to organize a variety of music practice activities, increase students' rational understanding of theoretical knowledge, and make students' music theoretical foundation more solid, so that they can really apply what they have learned. In music teaching, teachers can play relevant videos and use group discussions to guide students to express their feelings. Through a variety of innovative models, students can deepen their experience of musical emotions and ignite their enthusiasm for learning. In the long run, students' thinking ability, expression ability, comprehension ability and core literacy of music discipline will be significantly improved. As a popular processing method in recent years, big data technology has been widely used in the research process of natural science and social science. Therefore, the innovation and development of education reform can also be studied with the help of the processing mode of big data. However, it is inevitable that the application of big data processing methods first needs to determine a clear prediction target, in order to achieve the ultimate goal of quantitative research. This paper takes the three important indicators of the practical curriculum setting of music education majors in some universities in North China as the research objectives, and deeply studies the importance of professional teaching courses under the background of music education in China through the method of big data processing. These indicators mainly include the "practice", "situation" and "diversity" of the practical curriculum. Through the above analysis, this paper mainly studies the relevant content of China's music education reform. Specifically, we are committed to finding new ideas and methods for music teaching reform. To accomplish this goal, the manuscript mainly conducts related research content by introducing several typical big data technologies.

3. TYPICAL BIG DATA PROCESSING METHODS

3.1. Improved KPCA Method (Kolajo et al., 2019; Liu et al., 2019)

This paper adopts an improved KPCA method based on Fisher feature selection. KPCA refers to kernel principal component analysis method based on fisher feature improved selection. Firstly, the features that are most conducive to classification are screened based on Fisher-Score, and then KPCA is used to reduce the dimensionality of the features to realize the feature extraction of the data. The Fisher-Score is introduced into KPCA, and the category information of the feature is calculated according to the two indicators of the intra-class and inter-class vergence, and the nonlinear information in the feature and category space is extracted. And the features with a large contribution to the classification are selected to establish a new Kernel principal component analysis was performed on a subset of the data.

We can calculate the Fisher-Score for each feature.

$$F_{k} = \frac{F_{h}^{k}}{F_{s}^{k}} = \frac{\left(l_{i} / L\right) \sum_{i=1}^{e} \left(m_{i}^{k} - m^{k}\right)^{2}}{(1 / L) \sum_{i=1}^{e} \sum_{x \in \omega_{i}} \left(x^{k} - m_{i}^{k}\right)^{2}}$$
(1)

We can select the features with large inter-class distance and small intraclass distance to establish feature subsets, sort the features according to F k from large to small, and select the first multiple features to create a new dataset U $_{\rm LxM}$.

First, we should input a new dataset U $_{LxM}$; then, according to the kernel function K(xi,xj), the kernel function matrix K can be calculated:

$$\boldsymbol{K} = \left[K_{i,j} \right]_{L \times L} = K\left(x_i, x_j\right) = \phi(x_i), \phi(x_j) = \frac{1}{L} \sum_{j=1}^{L} \sum_{i=1}^{L} \phi(x_i) \phi^{\mathrm{T}}\left(x_j\right)$$
(2)

We can calculate the centering kernel matrix K.

$$\overline{K} = K - KI - IK + IKI \tag{3}$$

In the formula, \overline{K} represents the average matrix calculated by the core matrix linear algebra. This matrix represents the ensemble of prediction effects in the prediction calculation.

We can calculate the eigenvalue λ and eigenvector α of the center matrix. $\overline{K}\alpha = \lambda \alpha$ (4)

We arrange λ in descending order and calculate the cumulative contribution rate, and select the first m nonlinear principal components that satisfy Eq. (1):

$$\left(\sum_{j=1}^{m} \lambda_j / \sum_{i=1}^{L} \lambda_i\right) \geqslant 90\%$$
(5)

Equation (5) mainly expresses the possession of the predictor variables. That is, when the percentage of the basic proportion in the linear algebra operation is greater than 90%, the next step of the calculation process can be entered.

By calculating the nonlinear principal component Y of the sample data, we can achieve dimensionality reduction of industrial data.

$$Y = \overline{\mathbf{K}}^{\mathrm{T}} \cdot \left[\frac{1}{\sqrt{\lambda_1}} \, \boldsymbol{\alpha}_1 \, \frac{1}{\sqrt{\lambda_2}} \, \boldsymbol{\alpha}_2 \quad \cdots \quad \frac{1}{\sqrt{\lambda_m}} \, \boldsymbol{\alpha}_m \right] \tag{6}$$

The above formula is actually a problem about normalization in linear algebra. That is, the normalized variables are formed into a column vector and then the prediction operation is performed.

3.2. Adaptive Layer Immune Particle Swarm Optimization (Chang et al., 2012; Zhang et al., 2018)

The adaptive layer population P sa (t) is located in the middle layer of the model, and the number of particles in the population is the same as that of the sub-population in the lower layer. The population of this layer adjusts the flight direction and speed adaptively based on the global speed and fitness information (Bharati & Chaudhury, 2019; Lin et al., 2018). The particle velocity is updated as

$$W_{id}^{sa}(t+1) = \delta_1 V_{id}^{sa}(t) + \delta_2 B t$$
⁽⁷⁾

As shown in equation (7), the velocity and position of elite particles in each prediction calculation process can be updated by this equation. where B represents the weighting factor of the particle velocity. That is, each instance can be updated to the next changed state through the corresponding update mode. Each particle in the elite layer is regarded as an antibody, and it is sorted according to the affinity of each antibody and subjected to immunocloning operation to generate a temporary population. The clone fold Nc is related to the affinity of the antibody.

$$N_c = \partial D \frac{f_i}{\sum_{i=1}^D f_i}, \quad i = 1, 2, \cdots, D$$
(8)

In the formula, NC represents the partial differential value to be obtained by calculation. fi represents the function parameter corresponding to each partial differential value. This formula is to illustrate the proportion of the quantity corresponding to each function parameter. A variable-scale high-frequency mutation operation is performed on the amplified temporary population to achieve local fine-tuning while maintaining the diversity of solutions. The mutation operator can be expressed as follows.

$$\rho(t) = 1 - r^{[1 - (t/T)]^2} \tag{9}$$

The number of groups of different elite particle swarms is an important factor affecting the overall algorithm, and the calculation effect of the algorithm corresponding to different numbers of groups is shown in Figure 4. Figure 4 shows that as the number of computational populations increases, the accuracy of the immune algorithm of elite particles also varies to varying degrees. This is because there is always a suitable calculation point such that the best population size corresponds to the best prediction effect.



Figure 4: The Relationship between the Number of Elite Population and the Calculation Effect

To illustrate the problem, the BP neural network (Chen et al., 2019; Wang & Zha, 2019) optimized by genetic algorithm (Ding et al., 2019; Tao et al., 2019) is also used in forecasting research.

4. APPLICATION OF BIG DATA TECHNOLOGY IN MUSIC TEACHING REFORM AND DEVELOPMENT STRATEGY

As mentioned above, practical teaching is an indispensable teaching link in music education (Wang et al., 2021; Wei et al., 2019), and it is also one of the good countermeasures for the development of music education. Over the years, the major of music education in universities has basically been carried out in the way that teachers are responsible for teaching and students are passively learning. Teachers are in the leading position in teaching activities, while students are in passive and subordinate positions. Practical teaching requires making up for the shortcoming of students' subjectivity. Teachers must respect students' opinions and students' subjectivity. That is, both teachers and students are the main body, and there is no one who depends on the other. The two sides have independent personalities, and their roles are independent and complementary. This educational model emphasizes the interaction between teachers and students in the teaching process, and the atmosphere is democratic. More importantly, it can activate students' subjective initiative, allowing them to voluntarily and actively participate in the teaching activities of teacherstudent interaction. The effectiveness of teaching activities is the organic unity of constantly optimized teachers' teaching activities and constantly improved students' learning activities. Only by giving full play to the main role of both teachers and students, the subjective initiative can be well mobilized. Practical education raises the standards for admission to music skills. Judging from the more than 20 years of music art examinations, due to various reasons, a considerable number of high school students are not good at music, let alone because they like music (Maz-Machado et al., 2019; Nusseck et al., 2019). Because the "threshold" of cultural classes is relatively high, I switched to assault music.

This fundamentally affects the smooth implementation of practical teaching in schools, and ultimately affects the effectiveness of practical teaching. The author believes that the source of the problem lies in the low threshold of music majors. The music education major in universities is first and foremost the "music" major, so the admissions admissions should take the music professional level as the most important criterion. At the same time, it is also an "education" major, which is a content that should be cultivated simultaneously in the four years of college. There has been some debate over the years as to whether literacy should be an indicator of equal or even greater importance than music majors. If the professional standards are greatly improved in the admission selection process, the truly talented students will be recruited into the music school. At least to a large extent, it can be determined that the student has strong learning ability and strong comprehension ability. Through the study and comprehension of music, students can understand all aspects of social life by analogy. Figure 5 shows the relationship between student quality and time factor. As shown in Figure 5, with the change of the time factor, the student quality factor also has a certain change law. Specifically, with the change of the time factor, the student quality factor showed a trend of first increasing and then decreasing.



Figure 5: The Relationship between Student Quality and Time Factor

In addition to social functions such as aesthetics, entertainment, and cognition, music also has social functions of education. Music education also undertakes the historical mission of inheriting the excellent culture of the Chinese nation and the core values of socialism. In particular, students majoring in music education in universities will stand on the podium of primary and secondary schools in the future, directly teaching music knowledge to students and guiding value concepts. Therefore, in this sense, the major responsibility of music education in universities is very important. Figure 6 is a typical vibration signal in music teaching. It partly represents the vibrating melody in music (Zhao et al., 2021).



Figure 6: Typical Signals in Music Teaching

Practical curriculum setting must first focus on "practicality". Music itself is practical, and the music curriculum should also fully reflect the practical characteristics. Second, both music and music instruction should be "situational". Practical courses are flexible rather than fixed. Therefore, practical music courses more respect the characteristics of music and protect students' individuality. The setting of the situational curriculum should be eclectic, creative and sparkling everywhere. For example, the local courses, museum courses, study tour courses and camp courses implemented by some schools are all good explorations of situational courses. Practical courses should reflect "diversity". Practical educational philosophy holds that music and teaching are diverse human practices. Practical music courses guide students to understand music from multiple perspectives and levels, cultivate students' more effective learning ability, and cultivate students' independent thinking ability. The practical curriculum should reflect normalization, diversification and contextuality. For these three important indicators involved in the practical course, we conduct certain prediction research through typical big data technology. Figure 7 shows us the three-dimensional relationship scatter plot of three of the feature indicators. Figure 7 shows that the relationship between the different three variables can be characterized by a three-dimensional cloud map. It can be found that there are certain oscillations and irregular changes in the three-dimensional cloud image. That is to say, the functional relationship between different variables cannot be easily obtained through the prediction algorithm of big data processing.



Figure 7: The Relationship between the three Predicted Values Calculated by Big Data

We use the above three typical big data processing methods to conduct multiple prediction studies on the three important indicators involved in music education. To compare the prediction results of different methods, we use the concepts of coefficient of determination (Lavesson, 2010) and sum of squares of errors for discrimination (Hu et al., 2019).



Figure 8: Prediction Effect of Typical Big Data Processing Methods It should be pointed out that I represent s for Improved KPCA method,

II represent s for Adaptive Layer Immune Particle Swarm Optimization, and III represent s for the BP neural network optimized by genetic algorithm. As shown in Figure 8, the prediction performance index corresponding to the second big data processing method is the best. Therefore, the second method of big data can be recommended in the application of music teaching reform.

5. CONCLUSION

In the reform of music education in universities, it is an inevitable trend of the reform and development of music education in universities to attach importance to the penetration of diverse music cultures. Practical teaching is the direction of the teaching reform of music education, and it is also the focus and difficulty of the reform. By introducing three typical big data processing methods, this paper makes a prediction study on the important indicators in the practical courses involved in music education. The research results show that practical teaching plays an important role in the current music education reform, whether it is diversity or situational.

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