Exploring Neural Network-Based Analysis for Vocal Music Teaching Quality in Virtual Reality Solution

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Abstract. In order to study the analysis algorithm based on neural networks in vocal music teaching quality, this paper discusses the analysis algorithm of vocal music teaching quality. By comparing the education quality, comprehensive performance, and coupling degree of traditional network algorithms, it is statistically significant to see that the application of divine scripture network technology is better than the previous traditional network technology. At the same time, neural network technology is more accurate and clear for the input, output, and identification of various data of vocal music. From the extraction of singing sound signal parameters and subjective standardization, sorting out the current use of network technology, objectively evaluating the mainstream results in singing sound research, and scientifically and objectively evaluating vocal music teaching and state, which is of great significance to the diagnosis of teaching quality; It has positive significance and research value for China's educational development and talent art training.

Keywords: Neural network; Vocal music teaching; Teaching quality; Comprehensive analysis; Quality assessment; Virtual Reality Solution.
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1 INTRODUCTION

With China's economic development, the improvement of living standards and material life have also improved, and people's spiritual lives have also been enriched. Vocal music, as an important art form that enriches people's spiritual culture and cultivates people's sentiments, is becoming more

and more common in an increasingly developed society, and people's demand for vocal music is also increasing. Chen Hao (2022) music, as an important form of artistic expression, has been widely infiltrated into daily life, It can better regulate life and improve the quality of life [2]. Chenmengyun (2020) pointed out that the current vocal music teaching concept and teaching means are not perfect. For the teaching quality of vocal music, teachers' lack of teaching experience and other factors have a great impact on the teaching quality [4]. Jia Jingyu (2021) proposed that the application of teaching innovation in the education system breaks the traditional teaching mode. With the complementary advantages of the old and new modes, improving vocal music teaching improves the renewal of knowledge, and a new learning method improves the all-round development of vocal music [9]. Xu Yue (2017) the particularity of vocal music teaching content and form, the teaching quality of vocal music teaching needs a relatively perfect teaching organization concept and classroom quality monitoring and evaluation system [20]. Li Fang (2017) pointed out that the improvement of the basic quality of vocal music teachers has an impact on improving the quality of teaching, strengthening the basic quality of vocal music teachers and improving the quality of vocal music teaching, so as to improve the problems of vocal music teachers in opening vocal music teaching [12]. He Yue (2018) pointed out that the traditional one-on-one teaching form has been unable to meet the requirements of modern quality education. In order to further stimulate students' interest and learning ability, teachers organize students into one or several groups, arrange teaching content, and cultivate their cooperation and their own learning ability on the basis of students' team cooperation and common completion of learning tasks, so as to improve their singing ability faster, so as to improve the quality of vocal music teaching [8]. Zhou Min (2020) pointed out that with the support of Internet technology and multimedia technology, the characteristics of vocal music teaching are constantly changing, the informatization characteristics are constantly strengthened, the teaching methods are more intuitive, and the teaching effect is stronger, so as to promote the reform of vocal music teaching in China [24]. Li Yongchun (2019) proposed that the vocal music teaching method, based on the content of vocal music teaching, the organizational form of vocal music teaching, the vocal music teaching process, the evaluation of vocal music teaching, the links that should be grasped in vocal music teaching, and the problems that should be paid attention to in vocal music teaching, has made a systematic theoretical summary to improve the teaching quality according to the characteristics and laws of vocal music teaching at all levels and all kinds, combined with the basis of years of practical research [14]. With the continuous reform and development of education, art education has been paid more and more attention by the society, and vocal music class is one of the basic courses of education major. Professional vocal music teaching promotes the development of China's education, plays a great positive role in the cultivation of talents, and also improves the level of education. This requires vocal music teachers to help students establish good aesthetic taste in the process of teaching, and constantly reform teaching methods, In order to make students get better training.

2 BACKGROUND AND SIGNIFICANCE OF VOCAL MUSIC TEACHING

2.1 Vocal Music Background and Vocal Music Teaching

Since the development of human civilization, after the emergence of the concept of society, the development of civilization in the world has been diversified; The unification of the country, the division and collision of the continental plate have developed to this day. In the desolate polar environment and the bustling human settlements, despite the continuous wars and the development contradictions between mankind, there is a voice in the progress of human civilization under the complex historical background that has been running through to this day. Vocal music is a rhythmic, sweet and continuous sound that is mainly produced by human vocal cords, combined with nasal breath, mouth and tongue in the regulation of breath. The emergence of vocal music first began with human labor. In the short cheering sound in daily work, giving extended breath and rhythmic

breathing is the earliest vocal music, which is called "labor chant", which is the origin of music in labor. In the long-standing historical process of our country, the best inheritor of our civilization belongs to national music. The music of the primitive period was the music and dance with the trinity of song, dance and music, which is known as the earliest musical art form. In the ancient primitive music culture, it often includes the strong emotions and desires of people at that time; Before hunting in the mountains and forests, totem sacrifice, crop harvest, and before the war, there will be ceremonies such as song and dance art prayer and performance to pray and bless. This form of song and dance activity ceremony contains a lot of information about the culture of the times and human evolution, and conveys rich national cultural emotions. In primitive society, although vocal music performance is not delicate and beautiful, only simple syllables, it still has certain characteristics in the grasp of rhythm, which is the origin of Chinese vocal music culture and art. With the progress of society and the development of culture, when Chinese civilization entered the ruling class of imperial power and the civilization of slavery, the development of vocal music also changed to a certain extent. Folk music and dance entered the royal court. People who can sing and dance become professional musicians, have a higher level of skills, and are more ornamental. In the spring and Autumn period and the Warring States period, the emergence of the bookofsongs included three parts of "wind", "elegance" and "ode", including folk songs, including works of literati and nobles, personal lyric works, and music and dance of sacrificial temples. It contains a wide variety of song works, diverse and rich singing forms, and singing elements include love, labor, life, irony, etc. After the unification of the Qin Dynasty, a special music institution, Yuefu, was established, forming folk music with the Han nationality as the main body, collecting folk dynamics in various regions to make music into entertainment. Since then, folk music has become more professional. When music developed to the Tang Dynasty, influenced by the prosperous age of the Tang Dynasty, large-scale songs and dances appeared, which were called "Tang Daqu", enriching the form of music. During this period, there were more professional music education institutions, such as pear garden, which played an important role in promoting the development of music art at that time. With the development of Song Dynasty, music inherited the traditional music arts such as Han Yuefu folk songs and Tang Daqu, and further developed in poetry, folk art, zhugongdiao, song zaju, etc. rap music appeared in the construction of cities, and it has richer forms of expression in the performances of song taverns and Washe GouLan. Music developed to the Yuan Dynasty. With the development and prosperity of commercial economy, people's pursuit of art promoted the development of Yuan zaju. The opera music of the Ming and Qing dynasties developed and flourished on the basis of the historical remains of music, and became the artistic mainstream of national vocal music. According to the regional distribution and the accent of the language, a variety of opera forms were formed, such as Peking Opera, Kunqu Opera and other plays. The vocal music art, which has too strict requirements for the combination of rhyme and phonology, has trained a large number of talents in the field of vocal music art. With the development of the times to modern times, since the reform and Reform in 1898, new schools have been established and singing classes have been opened. With the invasion of western culture, the formation of new music singing, school songs came into being, forming lyrics music based on Western tunes. After the May 4th movement, driven by the new culture, early Chinese musicians introduced and absorbed western music culture, and combined it with Chinese folk music to create new art songs and school songs. In addition, after returning to China, many overseas students are no longer satisfied with the general lyrics and single melody in the creation of songs. They actively adopt the creative techniques of harmony and combine the traditional phonology to innovate and improve our songs, forming a modern music with a strong national flavor.

With the development of the times to the modern era, the progress of science and technology and the integration and acceptance of various Western cultures have contributed to an international cultural environment and an artistic environment, and even formed an artistic and cultural ecosystem. Under this environmental background, the training of children and professionals has

been put on the agenda. In China, most of the development teaching of vocal music is still based on Teachers' classroom teaching, and professional music classes are opened for teaching. Under the influence of art in modern society, most parents will invite professional tutors to teach in their spare time. However, collective teaching is not conducive to teachers' mastering personal situations. Too many student groups make teachers weak, and private courses are more expensive. In this case, teaching and training on the network has become a new way of education, which can not only enrich the learning environment and increase the freshness of learning but also contact the science and technology and advanced ideas of the new era. It plays a positive role in all-round development.

2.2 Classification of Vocal Music

With the development of the times and the maturity of music art, the so-called vocal music in modern times can be summarized into three categories They are bel canto, folk singing, and popular singing (pop singing). These three different singing methods and modes also indirectly form different performance styles and performance styles. Bel canto, also known as soft voice singing, requires singers to sing with half strength, and high-pitched performance requires natural and soft vocal methods. It originated in the 17th-century Italian singing style, with soft and beautiful timbre, good at change, large volume plasticity, consistent air and sound, and symmetrical and smooth sound connection. This singing method has a great impact on the world music art. After the May 4th Movement in China, bel canto was introduced into China and has a great role in promoting the field of music art in China. The second kind of folk singing refers to the singing of opera, folk art, folk songs and music creation songs with these three styles, which has the characteristics of the combination of folk singing and Chinese and Western singing in specific singing and vocal performance. Based on the traditional singing method of our country, it has absorbed the western singing methods and singing skills and formed the vocal way of living alone with the national characteristics of our country. Its main timbre is true, bright and front-end. In terms of emotional expression, it needs to achieve both sound and emotion, with a deep breath. It uses more true voice in high pitched singing. Popular singing is also a natural singing method and a popular singing method. It is a method used in singing pop songs. In terms of singing skills, it needs to use air singing method, falsetto singing method and crooning singing method. Its singing style is divided into three types: strong song type, soft beauty type and artistic type. Generally speaking, its singing is mainly light singing, without throat opening, shallow breathing, smooth sound line, attention to emotional expression, and the singing style is more casual.In the development of modern vocal music, there is also a distinction between high and low for the classification of the range, such as soprano, Mezzo Soprano, contralto and tenor, baritone, bass.There are three kinds of female singers, lyric, coloratura and drama, according to their singing timbre, range and skills.Lyric singing is good at integrating inner feelings and strong poetic and pictorial feelings into the lyrics and tunes. The female tenor of coloratura is light and flexible, similar to flute, and tends to sing happily, with strong emotions and ideals. The soprano timbre of the drama is inclined to strength, and has the performance of exciting and complex emotions.

3 DEMAND ANALYSIS OF TEACHING QUALITY

3.1 Teaching Mode

The quality of vocal music teaching mainly reflects the effect of classroom teaching. There are many reasons for the impact, including teachers' professional level, teaching methods, students' learning attitude, etc. However, vocal music teaching, as an art major, is different from other Weihua courses in that it pays more attention to the specialty of teaching courses and the interactive communication between teachers and students, which is very important for art training. Vocal music teachers must be the guides to solve vocal music problems, Guide students how to give full play to their breeding

characteristics and advantages and do a good job. Teachers and students can effectively communicate and study vocal music, tacitly understand and cooperate, so as to achieve the desired effect, make progress in vocal music learning, help the development process of teaching mode. Singing is the embodiment of personal inspiration and movement, and make use of the diversity of teaching mode to make instructors and learners learn and grow from it, In the process of growing up, we continue to practice innovation and reform to promote the development of vocal music teaching. Vocal music teaching adopts the teaching of teaching students according to their aptitude according to the differences of students. In the teaching activities full of personalized art, the principle of teaching students according to their aptitude and people is vividly displayed. For students with low range, general voice conditions, and ordinary receptive ability and savvy, when they are ready, emphasize vocal skills, and let them show more gracefully and easily as possible. Based on the idea of making every student succeed in learning, choose their own way according to their range, color, musical sense, receptive ability, etc, So that every student can learn more and more solid sound skills under their existing basic conditions, to be competent for the future music education and teaching tasks, and to activate literary and artistic life. The continuous practice of vocal music classroom is to innovate and Reform on the basis of combining the traditional vocal music teaching mode, apply it to practice, carry out collective discussion classes, and students discuss with each other the problems encountered in students' vocal music, as well as the basic principles, singing methods, vocal performance, progress of vocal music at home and abroad, music, etc., and make use of modern teaching equipment, such as multimedia, video equipment, radio equipment, etc, New teaching methods can stimulate students' enthusiasm, better understand vocal music knowledge, have clear goals and directions, and master skills. In addition, the individual teaching mode is what we usually call a small class. It is more a one-to-one teaching method. It guides students one by one according to their conditions, vocal music level and vocal characteristics, gives full play to students' expertise, excavates their potential, helps speed up their learning process, mainly uses the occurrence mechanism to find out how to feel how to produce resonance, breath, enunciation and expression and other professional qualities, finds problems in teaching and corrects them in time, Achieve the effect of eliminating the disease with medicine. After learning knowledge, it is time to show that practical courses are also a way to give full play to students' own level, participate in practical activities, campus competitions, festival performances, social welfare performances and personal concerts to maximize their potential, use all resources to improve learning efficiency, find experience in practice, make up for deficiencies, and improve in the accumulation of experience. In short, no matter what, we all have our own teaching mode, and the goal is to constantly strengthen, improve and summarize experience in improvement, reform and innovate in vocal music education, improve teaching level, and finally achieve all-round high-quality talents.

3.2 Systematic Evaluation of Teaching Quality

The teaching quality evaluation system conforms to the statistical analysis of educational measurement indicators and the dynamic monitoring of teaching quality, so as to achieve the purpose of improving teaching quality and teaching level. The school can easily realize the sharing and analysis of teaching data within the scope of teaching, so as to facilitate statistical analysis, teachers' statistical analysis of grades, student grades query and analysis, parents' analysis and tracking of grades, detailed analysis of grade reports, automatic statistics of total scores, automatic ranking, statistics of grades of each subject in each building, intelligent statistical calculation of standard scores and grade scores, and provide teachers and students' parents with a complete analysis of teaching quality, Learning level analysis function. The teaching quality is mainly formed in the teaching process, and the systematic evaluation report on the teaching quality can be obtained after the examination. The evaluation of teaching quality is mainly aimed at students and teachers. At the end of the course, students will evaluate the progressive teaching of the selected teaching

teachers. They will first choose the object of flat evaluation and enter the teaching module. After selecting the teacher, the system will conduct an evaluation questionnaire. Students will score each index, and then make a subjective evaluation. After submitting the questionnaire, the system will display the evaluation results. The teaching evaluation system can provide the starting analysis and evaluation report results of the theoretical basis of educational measurement and make the students' grades clear at a glance. The good ones can continue to maintain, and the bad ones can be followed up in time so that students can recognize their own problems in time and improve their learning methods in time.In the development of network technology, this evaluation technology has achieved certain results. In the process of network music evaluation and software use, personal music singing or musical instrument performance will usually be evaluated and scored. The application of this technology is also well reflected in the algorithm of neural network. The evaluation and calculation speed of vocal music is more efficient, and the accuracy is more detailed; in terms of system evaluation, it also has its own calculation method. Compared with traditional teacher teaching and evaluation, it has a broader scope of application. It is not limited to time and place, and teaching evaluation and testing can be carried out anytime, anywhere. It plays a positive role in cultivating modern students' artistic sense and ideological morality and is conducive to social development and cultural progress.

4   APPLICATION OF NEURAL NETWORK IN VOCAL MUSIC TEACHING QUALITY

Artificial neural networks (abbreviated as Ann NS) are algorithmic mathematical models that simulate the behavioral characteristics of animal neural networks and perform distributed parallel information processing. Depending on the complexity of the system, this network can process information by adjusting the relationship between a large number of internal nodes and has the ability to self-learning and self-adaptive. A neural network is an operational model that is composed of nodes (or neurons) and connections between them. Each node represents a specific output function, which is called an excitation function. The connection between each two nodes represents a weighted value of the signal passing through the connection, which is called weight, which is equivalent to the memory of an artificial neural network. The output of the network varies according to the connection mode of the network, the weight value, and the excitation function. The network itself is usually the approximation of some algorithm or function in nature, and it may also be the expression of a logical strategy. In the traditional teaching level, the evaluation of teaching quality is only through the simple treatment of teaching indicators. If the average value is obtained or the weight of each index is artificially given to weigh and sum, the evaluation result is very subjective. The model of the teaching quality evaluation system is established by using a neural network, and the teaching evaluation indexes are obtained through investigation and analysis. The scalar data is used as its input, the neural network is used as the actual output after training, and the teaching effect obtained before is used as the expected output. Compare the error between the expected output and the actual output. When the error reaches the expected minimum value, the training is considered successful. The neural network finds out the factors that affect the performance effect according to music theory, including note, rhythm, beat, melody, tonality, etc., and then quantifies each factor as the input parameter of the neural network. He Hongyan (2020) proposed the principle of computer neural network technology, designed the algorithm flow of the system in detail, extracted the performance characteristics of vocal music by using Fourier transform and its improved function, designed the key modules of the system according to the system framework and data processing flow, and gave the key design code. Finally, the evaluation accuracy of the system was tested, and the results showed that the system could reflect the real level of performers, It is conducive to vocal music teaching [7]. Yuan Jian (2010) neural network can simulate the nonlinear mapping composed of various factors, establish a vocal music evaluation system, objectify each evaluation index, use the score vector as the input, and obtain a reasonable score through the neural network output [22]. Li Xiaowu (2021) pointed out that using neural network method to objectively

evaluate the quality of singing, and compared with the subjective evaluation of senior vocal music teachers, the error is very small. The results show that neural network method can correctly and objectively evaluate the quality of singing by using evaluation parameters, which is helpful to scientifically guide the selection and training of artistic voice talents [13]. Gao Kun (2021) proposed that the application of artificial intelligence can help improve teaching efficiency, stimulate students' interest and improve the quality of vocal music teaching. He studied vocal music teaching in the direction of intelligent teaching equipment, archival singing materials and humanized training methods, and provided new ideas for the reform of vocal music teaching [6]. Neural network is a mathematical model put forward by simulating the thinking mode of human brain in artificial intelligence. It has the advantages of not strict requirements for data distribution, nonlinear data processing method, strong robustness and dynamic, and is very suitable to be used as the mathematical model of evaluation system. Neural network also has a strong theoretical foundation, and its application in various industries is also basically mature. The mathematical model of teaching quality evaluation system is established by neural network method, using various evaluation indexes as input and teaching effect as output. The prediction performance of neural network is affected by the selection of initial weight. The algorithm optimizes the initial weight of the model, which can effectively improve the effect of teaching quality evaluation of art and design majors, It provides a new reference for the teaching quality evaluation of art design majors.
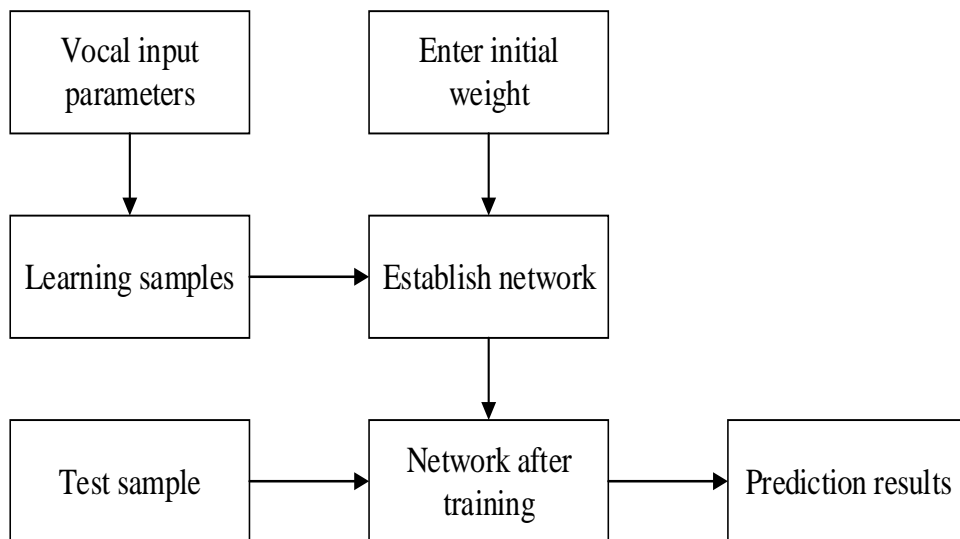

Figure 1: Flow chart of neural network vocal music evaluation.

As shown in Figure 1, it is the flow chart of neural network vocal music evaluation. In the evaluation based on neural network, the input and detection of vocal music data are effective. In vocal music teaching and assessment, there is a data embodiment and analysis process for the evaluation and advantages and disadvantages of one's own voice. In general teaching, teachers' scoring and professional evaluation will cause a waste of resources and time, Social teachers can't meet the huge number of students and assessment. The use of neural network evaluation system can effectively carry out evaluation and teaching experience at any time, which has a guiding role and positive significance for improving personal musical attainments and improvement direction. It provides favorable resources and technology for modern vocal music teaching, which is of great significance to the development of art and the training of artistic talents in our country.

5   COMPREHENSIVE ANALYSIS OF VOCAL MUSIC TEACHING QUALITY

5.1   Evaluation and Analysis of Vocal Music Teaching Quality Under Different Teaching Methods

Compared with traditional classroom teaching, the development and progress of the network provides a broader platform and environment for learning in all major areas of education; In the modern Internet era, the prosperity of preschool education and the prevalence of counseling outside the classroom are affected by the social environment and the demand for talents in education; Especially in the field of art, talent cultivation is more concerned by the majority of parents. In vocal music teaching, a lot of music software and training institutions have emerged on the network, and the mode of offline education has gradually begun to change to online. With the prosperity of online teaching, this paper compares the advantages and disadvantages of traditional classroom teaching in terms of teaching quality. Through the data comparison of the two, we get the following Table 1:

Group	Singing posture	Intonation rhythm	Emotional resonance	Singing skills	Range (above F2)
Classroom teaching	72.23	78.63	83.26	81.69	79.56
Network teaching	70.68	79.25	85.21	83.22	84.15

Table 1: Vocal music teaching evaluation under different teaching methods (score).

As shown in Table 1, the data analysis on the assessment and evaluation of classroom teaching and online teaching shows that the test results of online teaching and classroom teaching are relatively comparable, and the teaching quality can fully meet the requirements of modern vocal music teaching. In order to compare and evaluate more clearly, the data in Table 1 are visually taught to get Figure 2:
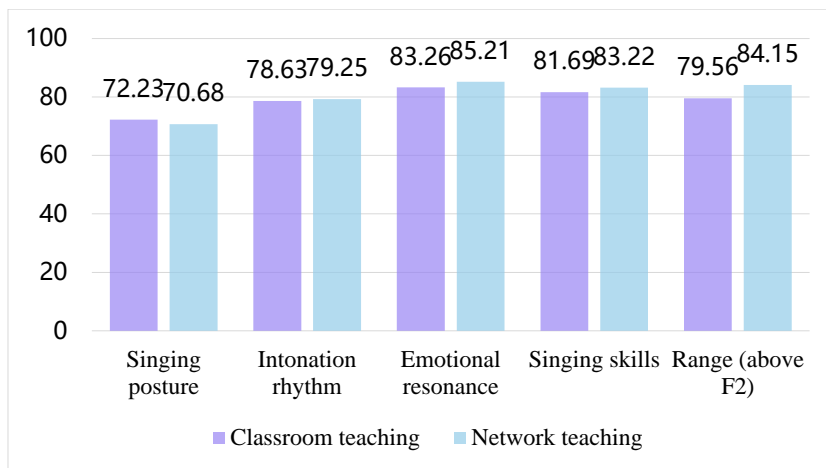

Figure 2: Vocal music teaching evaluation under different teaching methods.

As shown in Figure 2, from the comparison in the figure, we can see that the development of modern network meets the assessment requirements in terms of the progress and quality of learning vocal music, and the teaching space and time under the network environment are more free, which makes the modern teaching mode more diversified and diversified; The network environment is rich in resources and music resources, which makes it easier to find music resources and educational means that meet your own needs. Many teaching software and music software are more accurate in sound processing and acquisition simulation, and have professional level and technical means in sound evaluation and assessment. It also provides more possibilities and directions for the development of vocal music education in China.

5.2 Comprehensive Evaluation of Vocal Music Teaching Under Different Modes

With the development and progress of the network, the progress of various network technologies is more intelligent and anthropomorphic, the algorithm of the computer is progressing rapidly, the processing speed of various data is faster, and the recognition and calculation of sound are more professional; In the field of modern vocal music education, the comparative analysis between computational vocal music teaching and traditional online vocal music education from the perspective of neural network is shown in Table 2 below.

Group	Network vocal music teaching parameters			
	Note	Melody	Rhythm	Tonality
Traditional network mode	43.25	48.25	52.26	48.15
Neural network model	69.25	67.21	72.11	70.58

Table 2: Comprehensive evaluation of vocal music teaching under different network modes.

As shown in Table 2, the model based on neural network is more valuable and effective in vocal music teaching, and more accurate and clear in the input and output and recognition of various vocal music data. It is worth affirming in the value of education. It has a positioning and reference function for the future network development, plays a positive role in improving the international status of China's vocal music field, and provides more roads and direction guidance for the training of music talents. In order to facilitate identification, the data in Table 2 are visually processed to get Figure 3.
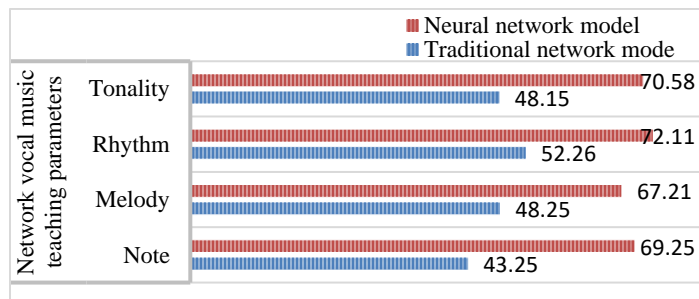

Figure 3: Comprehensive evaluation of vocal music teaching under different network modes.

As shown in Figure 3, from the analysis and comparison in the figure, it can be seen that the comprehensive analysis of vocal music in the neural network mode has a higher evaluation level and better effect than that in the traditional mode, and it also has high recognition and accuracy in the element recognition of vocal music parameters.In the teaching mode of neural network, the teaching quality can also be greatly improved, in the grasp of notes; Control of melody; The adjustment of song rhythm and the tonality of music are more in line with the standards of teaching. In the new era of vocal music teaching, for cultivating personal artistic cells, cultivating musical interest and advanced thinking, using network resources can adapt to the learning atmosphere and feel the artistic atmosphere in advance.

5.3 Quality Analysis of Vocal Music Teaching Mode Under Different Algorithms

After the western music art was introduced into China, with the integration and development of traditional music and Western culture and art by Chinese musicians, a unique national vocal singing method was formed. At the same time, the Western vocal singing method and teaching mode were also introduced into China's art field. After the Internet developed to internationalization, as the distance between space and time narrowed, the art fields at home and abroad were affected by the international environment, In the development of the art field in the new era, the following Table 3 is obtained by comparing the data of music teaching coupling in two different algorithms:

Group	Bel canto Teaching	National Singing Teaching	Pop singing teaching
Traditional algorithm	53.22	55.1	50.36
Neural network algorithm	66.85	73.15	77.52
t	7.256	7.956	8.045
P	0.045	0.004	0.038

Table 3: Analysis of coupling degree of vocal music teaching quality under different algorithms.

As shown in Table 3, it can be seen from the table that the three different vocal music modes of bel canto, folk singing and pop singing are more coupled and progressive in the algorithm of neural network, and are closer to the pace of progress of the times in terms of learning efficiency. The data in the table are visually processed, and Figure 4 is obtained.
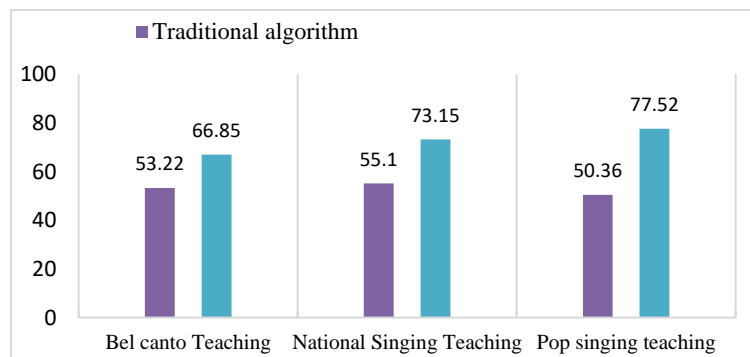

Figure 4: Analysis of coupling degree of vocal music teaching quality under different algorithms.

As shown in Figure 4, it is obvious from the vertical chart in the figure that the numerical coupling degree of the neural network algorithm is higher, and the data growth is more obvious than that of the traditional algorithm. In the field of vocal music teaching in China, the application of neural networks is more valuable and cost-effective. Based on the network, the evaluation and review of music meet the standards of music evaluation. In the field of modern music, art needs to be cultivated from an early age. In learning, the network environment can better provide a broader educational environment and teaching reserves. Let students begin to touch the artistic atmosphere from childhood and cultivate a sense of music and experience.

6   DISCUSSION

With the continuous improvement of the quality of life, people's demand for spiritual civilization is also increasing. As an important form of artistic expression, music has been widely infiltrated into daily life, which can better regulate life and improve the quality of life. At the same time, people's aesthetic level is also gradually improving, which puts forward a higher demand for vocal music expression and brings greater pressure to vocal music teaching activities. In teaching management, teaching documents and teaching data contain a large amount of teaching-quality information. Through data analysis and mining, aiming at the problem of data analysis model design, this paper puts forward a real-time data analysis platform framework combining a teaching management system and data analysis platform and a teaching quality analysis model based on data analysis. Jiang Yuguang (2022). During the examination, the system uploads student scores (audio files) to the background server in real-time, and the algorithm performs automatic quantitative evaluation and scoring. In the design of the scoring algorithm, the development package is used to collect multi-dimensional data such as sound intensity, pitch, and beat, and the trimmed convolution neural network is used to convert audio signals into images by learning the Mel spectrum so as to conduct preliminary music artistic sense analysis [10]. Tang Chongcheng (2021) music has the function of cultivating students' ideology and sentiment, and it is also a method for students to relax tension. It can effectively play the role of primary school music classroom teaching, make students truly realize the fun and value of music learning, and make primary school music classroom teaching an important topic [17]. Scout (2021) music is an indispensable course in primary and secondary schools. Music courses play an important role in improving students' musical literacy, cultivating students' sentiment, and helping students cultivate good will. As a music education and teaching worker, we must keep pace with the times and make innovative and breakthrough new contributions to improving the quality of music education and teaching [19]. Chen Wanqi (2021) pointed out that the problems existing in music classroom teaching in primary and secondary schools are not only the reasons for the classroom, but also have a lot to do with the outside world, so the teaching effect is not obvious. Reforming teaching innovative thinking and improving music teaching level will promote the improvement of music classroom teaching quality in primary and secondary schools [3]. LAN Xiaoman (2021) pointed out that the development of music courses is of great significance to the improvement of students' music literacy and comprehensive quality, and the development of music appreciation courses is also the key to music teaching. The quality of music appreciation teaching is effective in improving the quality of music appreciation teaching in primary and secondary schools, and can promote the development of music teaching [11]. Tang Wei et al. (2020) proposed that in the music classroom, teachers use classroom teaching language, which will directly affect the classroom teaching effect and students' learning situation. The music classroom teaching language has the characteristics of classroom teaching language of music subject characteristics. When implementing music classroom teaching, teachers should standardize the organization and use of explanatory language, organizational language, body language, written language to meet students' learning needs, Promote the development of classroom teaching and improve the quality of classroom teaching [18]. Liu Ming (2020) proposed that the development of chorus teaching is beneficial to students' teaching development. It can develop the ability of cooperation and

coordination in the cultivation of students' sense of music and music aesthetics, and use the form of collective activities to improve the vitality of music classroom, which is conducive to improving students' interest in music. Under the condition of music teaching, music teachers adopt the method of chorus teaching, change the single chorus teaching mode, and create a new chorus learning environment for students [16]. Yang Rui et al. (2020) tried to put forward the method of cultivating students' autonomous learning concept in music teaching, in order to improve the quality of music teaching in primary and secondary schools [21], in order to guide learning individuals to actively participate in music activities and improve their appreciation ability, from the perspective of music education, with autonomous learning as the concept, and the adverse effects brought by the lack of autonomous learning concept in music education. Zeng Honghua et al. (2020) proposed that practical teaching is a very important part of the practical teaching of music majors in Colleges and universities, build the quality standard of professional practical teaching in Colleges and universities, practice its connotation, standard construction and specific three aspects, and formulate the quality standard evaluation system, so as to provide reference for the practical teaching of music majors in other colleges and universities [23]. Liu Liangwei (2020) pointed out that the use of Kelvin gestures and graphic spectrum teaching in music teaching has brought a new teaching atmosphere to classroom teaching. Kelvin gestures can easily understand the relationship between the high and low levels of sound levels, and can vividly express the tonal level tendency of modes, while graphic spectrum attracts children's interest with its unique intuition and interest [15]. With the reform and innovation of music teaching, Deng Honglin (2020) adopted the game teaching method, which fully caters to the development characteristics of students, stimulates students' learning interest, improves students' learning enthusiasm, and promotes students' happy learning [5]. Caitingting (2020) pointed out that the experiential teaching method is based on experience, which can stimulate children's learning interest and enthusiasm, and can effectively improve the teaching quality and teaching effect [1]. The teaching method of vocal music teaching is relatively special, which must be completed through face-to-face teaching by teachers. Vocal music is the art of sound, so the requirements for the quality of sound are very high. Therefore, teachers are the leaders in the whole process. The level of quality education has a great impact on the teaching quality. Professional teaching ability is also very important for students. The stronger the professional ability of teachers, the higher the efficiency of teaching quality, Coupled with the targeted adjustment of teaching methods, improve the enthusiasm of children, so as to improve the quality of teaching.

7   SUMMARY

With the continuous improvement of people's living standards and the needs of the times, we should pay attention to the development of education in many aspects and cultivate comprehensive talents. Among them, vocal music is very popular among the public, which can not only allow students to cultivate their own interests, but also relax after learning. In vocal music teaching, the teaching concept does not keep up with the times, the teaching method is single, the teaching content is imperfect, and the level and professional quality of vocal music teachers need to be improved. These problems directly affect the teaching quality of vocal music, and the teaching quality directly affects the progress of students' learning.Improving the teaching quality of vocal music is our most important topic at present. Because vocal music teachers are singers, they can better teach students if they have certain singing skills. Therefore, vocal music teachers should take advantage of various opportunities to learn and improve themselves, master as many vocal music singing skills as possible, and form correct artistic concepts. At present, online music classes in vocal music classes still adopt the standards of traditional offline music courses, and the establishment of online music teaching system has become a factor for the sustainable development of education.This paper presents the application of neural network in vocal music teaching. First, extract the parameter characteristics of vocal music, select the learning samples, select the optimal characteristic signals, and speed up the recognition speed. Then, use neural network to train its characteristic signals,

establish the best model, and finally obtain the prediction results. The same or even better effect can be obtained in network teaching as offline teaching. This paper provides a comparison of the comprehensive evaluation of teaching under the traditional mode and neural network mode. It can be found that the learning effect and post-school evaluation of teaching under the neural network mode and method have a good effect, which shows that the progress of modern network brings not only scientific and technological innovation, It also plays a positive guiding role in the development direction of the whole education field. It effectively solves the problems of lack of teacher resources and professional shortage. In social development, neural network technology and computing methods are also applied to the development of various fields, which has better help and research value for the development of the concept of socialism with Chinese characteristics. the fusion of neural network-based analysis with virtual reality (VR) for vocal music teaching represents a paradigm shift in music education, offering unprecedented opportunities for personalized and comprehensive learning experiences.

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