

Application of Big Data Technology in Vocal Music Teaching

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Abstract. In order to understand the application of big data technology in vocal music teaching, an application research based on big data technology in vocal music teaching was put forward. Firstly, this paper analyzes that the application of big data technology in vocal music teaching has far-reaching significance. In addition to effectively reforming educational means, it can also significantly improve classroom teaching efficiency, mobilize students' product polarity in vocal music learning, and significantly improve teachers' professional education skills and students' vocal music level. Secondly, it analyzes the current situation and problems of music teaching at this stage, and then tells the application significance of big data technology in vocal music teaching. Finally, it discusses the application strategy of data technology in vocal music teaching, which lays a sufficient theoretical foundation for the development of vocal music education industry and promotes the development and reform of vocal music education industry.

Keywords: big data technology; Vocal music teaching; Application strategy.

1 Introduction

The so-called big data refers to the process of using computer information processing technology to convert sound, light, electricity, magnetism and other signals into digital signals, or to convert voice, text, images and other information into digital codes for transmission and processing. Big data teaching system is a modern teaching method. It collects, processes and plays pictures, texts, sounds and images in real time and efficiently, which can give full play to the potential and overall efficiency of people and equipment and achieve the purpose of sharing teaching information resources and equipment resources. Because big data teaching method has great superior performance, it is the need of modern education reform and development to apply big data teaching to classroom teaching as soon as possible.

First of all, big data analysis technology can analyze historical documents, recordings, music scores and other data, provide composers with more music materials and creative inspiration, and help them create more infectious vocal works. For example, many modern songs adopt different music genres, which can be obtained through big data analysis and then synthesized, making the works more complex, innovative and artistic. Secondly, big data technology has also played a great role in vocal music performance[1]. Big data analysis technology can collect and analyze the music data of performers, including pitch, intensity, speed, etc., and make timely adjustments during the performance, making the performance more accurate,

vivid and infectious. In addition, big data analysis technology can also establish a music database and conduct multi-dimensional analysis, so as to provide more convenient and accurate reference information for the audience and help them better understand and appreciate vocal music. Furthermore, big data technology has also had a positive impact on vocal music education. Big data analysis technology can analyze students' music data, help teachers find students' problems and shortcomings, and provide accurate guidance and training in time; At the same time, according to a student's performance and performance needs, a suitable study plan can be tailored to help him achieve better performance results. In addition, the most important thing in music education is to cultivate students' musical literacy and aesthetic quality. Big data analysis technology can also help in this respect. By building a music education database, educators and learners can be provided with more comprehensive and accurate music materials and music performance data, and their ability to understand and appreciate vocal music can be improved. Finally, big data analysis technology provides more methods for academic researchers to collect and analyze music data, which makes the research on the history and performance skills of vocal music more comprehensive, in-depth and accurate[2]. Through big data analysis, we can continuously and deeply explore the essential laws and singing skills of vocal music, and find the unity of its scientificity and artistry, which will inject new vitality into the development of vocal musicology. As shown in Figure 1:

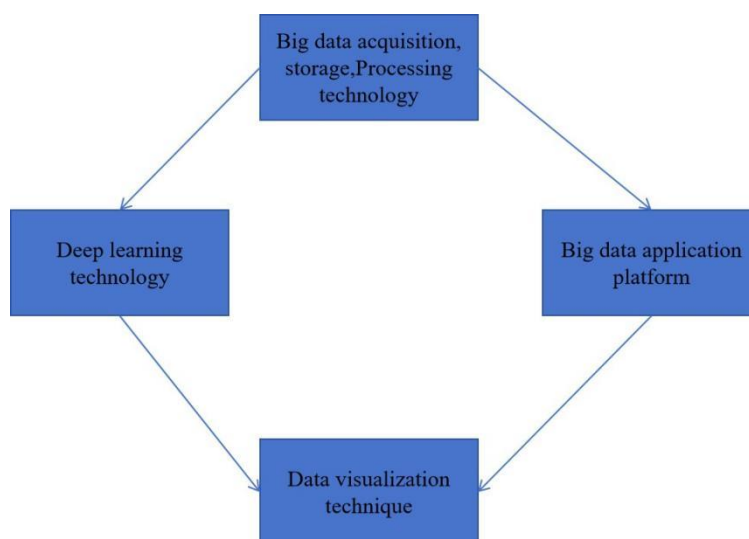


Fig. 1 Big data technology.

2 Current situation and problems of music teaching

According to the education of music discipline system, vocal music education is an important part, but considering its strong systematicness, abstract knowledge points and great difficulty in understanding, the difficulty of vocal music education has increased significantly. If teachers simply explain some knowledge points in vocal music teaching, such as theory or singing skills, they can't achieve the expected goal of mobilizing students' learning initiative and enthusiasm, and it is difficult to urge students to improve their musical literacy. Under the

current background, the public needs are more diverse, and the public spiritual culture is also more diverse. In addition, the requirements of all walks of life for vocal music education have increased significantly under the background of deepening the reform of quality education[3]. Teachers must base themselves on social needs and comprehensively consider the actual situation of students to design targeted educational content, so as to achieve the goal of improving the quality of classroom teaching. Combined with the current situation of vocal music teaching in China, we can know that there are several main problems:

(1) There is no systematic curriculum.

Under the influence of the pressure of entering a higher school and the concept of exam-oriented education, both parents and students pay close attention to the question of grading. Students pay more attention to their own theoretical basis of vocal music when learning vocal music. Teachers set courses based on basic content and basic theory, and pay more attention to the education of theory and skills, without fully considering the essence of vocal music education, that is, let students learn the cultural connotation of vocal music and cultivate their musical literacy. Therefore, students pay more attention to the study of skills in the process of learning vocal music, and they don't know enough about the connotation of vocal music knowledge, so they can't see the development of students' vocal music career, which is not conducive to cultivating comprehensive talents in vocal music[4].

(2) The educational method is single

At present, the majority of vocal music teachers only impart knowledge to students when carrying out teaching activities, and students are in a passive state of acceptance in their learning. An in-depth analysis of the reasons shows that the vocal music teaching and education system is complicated and contains a lot of strength knowledge, which leads teachers to stay in the vocal music teaching and simply impart knowledge, naturally ignoring practice and practice. In addition, teachers did not study teaching methods in depth, did not carry out targeted educational activities based on students' specific conditions, and were limited in teaching objectives and teaching contents, which was not conducive to cultivating students' creative thinking and professional ability, resulting in students' lack of initiative, autonomy and enthusiasm in learning, and the overall educational effect was not ideal.

(3) The teaching content is backward

Vocal music education is one of the more complicated projects, and it is a dynamic process. It does not need to stick to specific requirements and forms, but teachers need to carry out educational activities based on vocal music characteristics and students' characteristics when carrying out teaching activities, so as to create an educational method with vocal music characteristics and significantly improve classroom teaching efficiency[5]. However, at present, the traditional vocal music education in China is still based on basic education, and the updating speed of teaching materials is slow, and both the teaching materials and the content of teaching materials are relatively backward. Some teaching materials are biased towards theoretical teaching and lack of practical training content. Under this background, teachers only teach students vocal music knowledge, so it is difficult for students to digest the knowledge of professional terms, and it is mainly indoctrination, and there is little interaction between teachers and students in class. At the same time, on the basis of lack of teaching

equipment, students rarely have the opportunity to train, let alone create and train, which has different degrees of influence on students' digestion, absorption and innovation.

2.1 The significance of big data technology in vocal music teaching

(1) Stimulate students' enthusiasm for learning

In vocal music teaching, big data technology is applied to integrate pictures, sounds, etc. to educate the image, so students can give full play to the role of big data when appreciating or creating works; The application of big data can help students find and fill in the gaps in time, and review the unsound knowledge. Students no longer rely entirely on teachers' explanations in their studies, resulting in a strong enthusiasm for autonomous learning and improving their autonomous learning ability[6].

(2) Abstract knowledge becomes more concrete.

With the help of big data technology, teachers in vocal music education can make abstract and complex music knowledge more concrete, so that students can deeply understand the emotions expressed in musical works when learning musical instruments, and promote the better integration of vocal music theory and practical education.

(3) Significantly improve the teaching efficiency.

From the teacher's point of view, the biggest advantage of using big data to assist vocal music teaching is that it can effectively save the time of writing on the blackboard in class. Teachers can make relevant teaching courseware before class, so that teachers only need to play the knowledge points related to this class to students in class, and students will be clear at a glance. With the application of this technology, teachers don't need to spend a lot of time memorizing lyrics, but have enough time to study teaching methods, which significantly improves the efficiency of classroom teaching[7]. As shown in Table 1:

Table 1. Differences between Traditional Vocal Music Teaching and Big Data Vocal Music Teaching.

Traditional vocal music teaching	There is no systematic curriculum.	Single educational method	Backward teaching content
Big Data Vocal Music Teaching	Stimulate students' enthusiasm for learning	Abstract knowledge becomes more concrete.	Significantly improve teaching efficiency

3 Big data technology in vocal music teaching application strategy

(1) Give full play to MIDI technology to cultivate students' sense of rhythm and intonation.

Many students say that the difficulty in vocal music learning is to grasp intonation and rhythm, but for vocal music learning, the learning of intonation and rhythm belongs to a relatively basic content, and it is even more important. If students do not form good pitch and sense of rhythm, it will weaken students' enthusiasm for learning vocal music. From the analysis of traditional vocal music education, teachers help students correct pitch mainly through piano training, so as to cultivate students' sense of rhythm. However, the teaching effect of this mode is not ideal, mainly due to several reasons. One is that more teaching

equipment is needed, and it is difficult for teachers to change occasions when carrying out teaching activities. Vocal music teaching must be carried out in places with musical instruments, otherwise it cannot be carried out. The other is that most musical instruments, including pianos, are prone to sound difference problems in the process of long-term use. If they cannot be corrected accurately, there is likely to be misleading teaching problems. Therefore, teachers can play the role of MIDI technology in teaching and make the corresponding piano teaching audio on the computer in advance. In this way, students can deeply understand the interest contained in the timbre of various musical instruments in their study, and for teachers, they can also be freed from traditional classroom playing, which solves the problems of unsuitable venue and insufficient equipment in traditional education, so as to expand the space of vocal music classroom education.

(2) Play the role of big data video to train students' vocal performance manners.

In-depth analysis of vocal music connection shows that it is not only the study of sound, but more importantly, it helps students to correct their posture when singing, so that they can always sing songs with excellent manners when performing. According to the current situation of traditional vocal music teaching, students are mostly relaxed in specific training, but they are very uncomfortable or nervous when they perform on stage, which has a bad influence on the overall performance level. Therefore, in vocal music education, the function of big data video is brought into play. Through the function of big data video, students are vividly shown the singing skills on the stage, and then the key points are comprehensively explained to students, so that students realize the necessity of stage manners in vocal music performance, and aesthetic education is subtly carried out in this process[8]. After that, combined with the big data video recording function, the whole process of students' performances was recorded, and the students' vocal music manners were objectively evaluated and commented with the screen. In this way, students can learn about themselves in the performance process through videos, clearly understand the problems existing in their own manners, and then attach great importance to them in training, so as to significantly improve their training effect.

(3) Give play to the function of influencing video simulation and break through the difficulties in education.

Compared with other music courses, vocal music education has the characteristics of complexity and abstraction. In performing, attention should be paid to the application of various organs in singing, and more attention should be paid to the changes of vocal position and breath. These contents can't strengthen students' understanding through teachers' oral narration, so it is difficult for beginners to learn, so they can only achieve the goal of imitation through a lot of training, so the overall learning efficiency is not high. However, to play the role of big data technology, we can simulate the movement state of organogenesis with the help of images and videos, and we can also pause or narrow the key contents according to the learning needs, so that students can be visually stimulated, strengthen their learning and understanding, and enable students to correctly understand the differences between mistakes and correct ways, and also understand the disadvantages of wrong ways, so that abstract learning becomes more vivid and learning efficiency is higher.

(4) Play the role of recording and sound spectrum to strengthen students' understanding of sound conditions.

Whether students or teachers, their own sounds are different in their own ears and others' ears, so many students will have the illusion that their rhythm and intonation have reached a certain standard, but this is not the case. Because there is a big gap between sound propagation in the air and sound transmission from the throat to the ear through body vibration, the timbre also shows some differences. Under this background, the function of recording big data and analyzing sound spectrum waveform is played. The sound amplitude and frequency are expressed by line chart and then analyzed, and the invisible sound conditions are transformed into shaped data or lines. In this way, students can truly understand their own voice conditions, and then guide students in a targeted manner to improve the efficiency of vocal music practice[9-10]. As shown in Table 2:

Table 2. Strategies of Big Data Technology in Vocal Music Teaching.

	MIDI technology	Video simulation function	Big data video function	Recording and sound spectrum effect
superiority	It solves the problems existing in traditional education, such as unsuitable venue and insufficient equipment, so as to expand the space of vocal music classroom education.	Stimulate students visually, strengthen students' learning and understanding, enable students to correctly understand the differences between mistakes and correct ways, and also understand the disadvantages of wrong ways, so that abstract learning becomes more vivid and learning efficiency is higher.	Students can learn about their performance through videos, clearly understand the problems existing in their own manners, and then attach great importance to them in training, so as to significantly improve their training effect.	You can truly understand your own voice conditions, and then guide students in a targeted manner to improve the efficiency of students' vocal music practice.

4 Experimental results

According to the results of the student questionnaire survey, 88% of the 688 students liked the music lessons. Most students find the music class very relaxing and fun. Teachers will show them their favorite videos, musicals, songs, etc. Another 12% thought they were neutral. According to statistics, most of the reason is because the teacher only teaches them to sing in music class, and the form is very boring.

According to Table 3 and Figure 2, 69.6% of students liked the use of modern big data technology in music teaching, 14.9% said they were neutral, 5.1% said they were not, and 10.4% thought it was not important. The results show that the application of big data technology in music class is the favorite way for students.

Table 3. Do you like music courses using big data technology?

	Like	Generally	Don't like	It doesn't matter
Number	479	103	34	72

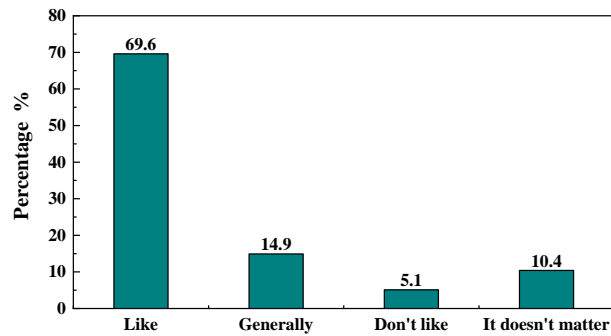


Fig. 2 Percentage of liking.

Compared with traditional music courses, students think it is more effective to use modern big data technology in the classroom. According to figures 2 and 3, 68.4% of the students were very good at using big data technology in class, 29.6% were average and 2% were unsure. The study found that more than half of the students believed that using big data technology in music classes would be very effective.

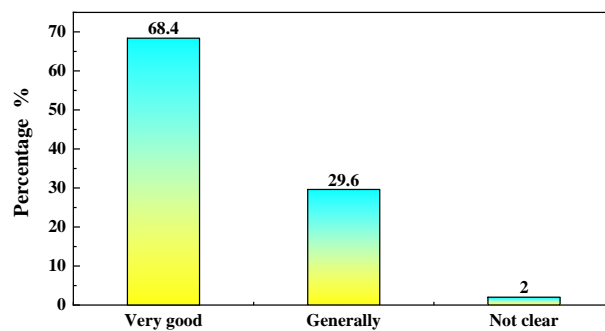


Fig. 3 The percentage of classroom effects using modern big data technology.

5 Conclusion

The application of big data technology to vocal music education effectively enriches the

teaching mode, improves the teaching professionalism on the basis of traditional education, enables students to better find existing problems in their studies, gives full play to the role of big data technology to improve teaching, stimulates students' enthusiasm for learning, maximizes the efficiency of vocal music education, and lays a good foundation for improving students' comprehensive vocal music ability.

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