Application of Computer Technology in Vocal Music Teaching

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Abstract. Since the 1990s, computer technology has gradually developed and has been widely used in various fields of society. Vocal music education may be affected by computer technology. With the entry of computers into thousands of households, the number of people using network learning increases, and vocal music education also ushers in opportunities. With the continuous maturity of computer technology, the development of relevant education model, improve the efficiency and performance of education, cultivate more things. In vocal music education, the rational use of computer technology can integrate text, sound, animation and influence, in order to make students understand and master the abstract vocal music knowledge. The introduction of digital technology in phonetic education can make vocal music education more intuitive. The content of digital music education includes multimedia music education, digital music production and online music education. Students can receive education from all aspects, expand the field of education and improve artistic performance. With the continuous development of computer technology, it emerges as the times require under the new normal and is closely related to various fields of social construction. As one of the development forms of educational activities in the era of big data, computer technology has the advantages of advanced technology, rich resources, diversified forms and strong interactivity. Therefore, it can improve the comprehensive quality of education, and the development of relevant teaching modes is widely concerned in the field of education. Objectively, it creates convenient conditions for students' comprehensive learning, independent development and in-depth exploration. With the development of computer technology, in order to improve the effect of college vocal music education, computer technology is widely used in various fields of society. It plays a role in promoting the development of various fields of society. At the same time, with the application of computer education technology in vocal music education, the teaching methods and teaching methods of vocal music education have also changed. In vocal music education, the discussion of computer technology has become an important reality to improve the quality and efficiency of vocal music education. This article, as the starting point and specific application of computer technology in vocal music education, explores the methods to improve the quality and efficiency of vocal music education, and studies and discusses the application characteristics and value of computer technology in vocal music education.
Keywords: Computer Technology, Vocal Music, Digitization, Teaching

1. Introduction
From an international perspective, China's vocal music education is still at the western level in the first half of the 20th century. Chinese traditional education thought is bound by traditional education mode for a long time. Vocal music education mainly focuses on singing and vocalization, sometimes including music theory, which has not reached the status of core subjects in general schools. People's understanding of vocal music education is still in the early stage of Education [1]. According to statistics, there are less than 500,000 vocal music teachers in China. This huge number will weaken the foundation of vocal music education in China. Our concept of education lags behind the development of digital technology. Computer music began to gain popularity and prosperity among the public, and gradually penetrated into the school vocal music education. The state has repeatedly proposed "using modern educational methods to cultivate modern scientific and technological talents" [2]. It is necessary to correctly handle the relationship between "information technology and education integration", adapt to the new situation, continuously improve the concept of education and accept new methods. In the face of the pressure of expanding college entrance to vocal music education, vocal music education reform is imminent [3].

Today, the application of computer technology can increase the amount of information in vocal music education. Now the theme of vocal music is more and more closely related to other themes, and more and more knowledge is involved, and it is gradually developing towards the direction of refinement. In this era, the traditional vocal music teaching method does not meet the requirements of vocal music professor [4]. Reasonable use of computer technology can organically combine video, text, animation and image. The transformation method is simple and flexible, and has a lot of information. To a certain extent, it can shorten the time of knowledge transmission and simplify vocal music education. Second, the use of computer technology can improve the interaction and vividness of vocal music education. Vocal music education contains many singing theories. If we only rely on oral explanation, the education content will be very boring. This knowledge can be vividly displayed through videos, pictures and other elements by using computer technology, which will bring visual and auditory stimulation to students. This will stimulate students' enthusiasm for vocal music education [5]. In addition, the use of computer technology can set up a variety of interaction links in order to strengthen the communication between teachers and students. Finally, computer technology is used to realize resource sharing. The combination of computer technology and Internet, through a number of network platforms to achieve regional resource sharing, break the previous classroom education mode and time and space constraints, encourage vocal music learners in different regions to explore and cooperate together. Teachers can also record lectures to educational videos, upload them to the Internet through computer technology, and learn from more vocal music learners [6].

The development of computer technology has changed the way of knowledge transfer through multi-channel interaction before unilateral knowledge. The role of teachers will also change from knowledge communicator to designer and lecturer of learning activities, and the teacher-student relationship will also change into learning partner and learning community [7]. Professor Zhong bingline, President of China Education Association, said: "with the rapid development of science and technology, great changes have taken place in the channels and methods of knowledge acquisition. The close integration of computer technology and education has overthrown the traditional learning curriculum "[8]. Therefore, it is necessary to deepen the integration of computer technology and vocal music education, improve vocal music teachers' education ability in the information society, improve education methods, and innovate and learn music through digital platform for vocal students and music lovers [9]. This topic is the direction of our research and reform of vocal music education in the information society. Through the application of digital technology in the field of higher music education, it will play an important role in gradually promoting among music lovers [10].
2. Methods

2.1. TF-IDF Algorithm
The calculation formula of TF is shown in formula (1):

\[ tf_{i,j} = \frac{n_{i,j}}{\sum_k n_{k,j}} \]  

Among them, \( n_{i,j} \) refers to the number of times the word \( t_i \) appears in the file \( d_j \). The denominator represents the sum of all word counts in the \( d_j \) file.

The basic definition formula of IDF is shown in (2):

\[ idf_i = \log \frac{|D|}{|\{ j : t_i \notin d_j \}|} \]  

Where, \(|D|\) refers to the number of all texts in the text set. \(|\{ j : t_i \notin d_j \}| \) represents the number of texts containing the word \( t_i \), and in order to prevent words from appearing in the text set, that is, the value is 0, it is generally optimized to \( 1+|\{ j : t_i \notin d_j \}| \).

Therefore, the calculation formula of TF-IDF weight is as follows:

\[ tfidf_{i,j} = tf_{i,j} \times idf_i \]  

From these formulas we can get the information we need.

2.2. Realize Personalized Teaching
With the continuous development of computer technology, the interaction between human and computer is more and more strengthened. This interaction provides opportunities for innovative vocal music education. In the vocal music education curriculum, teachers will be different according to the students' sound characteristics and conditions. Individualized education is carried out for students, teaching students according to their personality, and the quality of education projects and models targeted according to the actual situation of students. Please make the best use of the students' phonetic learning potential. For example, teachers can organize students with insufficient knowledge of music theory to explain these learning difficulties through relevant Animation videos. At the same time, combined with the network platform, realize the two-way choice between students and teachers. In other words, teachers can form personalized vocal music education projects according to the characteristics of students, and students can choose other teachers according to their own interests and interests, so as to truly realize personalized education.

2.3. Vocal Music Computer System
In order to use computer technology to cultivate students' vocal temperament, it is very important to master the singing performance and singing posture. In the traditional vocal music education, in order to cultivate the singing ability and singing posture, students can adjust the expression and posture. In order to standardize the expression and posture of students, they will face the mirror. But in this training method, students are in a state of tension. They will pay attention to whether the facial muscles are relaxed, whether the shoulders are upturned, and whether the voice is stable. The more you worry, the less satisfied you will be with this performance. Through the video, students can see the singing posture, and can also use computer technology to guide students to sing temperament. In this process, students pay attention to their emotional communication in the concert, integrate it into the work of the singer, unconsciously show a good song state, which helps to ease the psychological of the
song. Compared with the traditional singing performance and posture education, this training method will get more satisfactory results. In the process of students looking for their own shortcomings in the video, teachers should participate in the joint observation, analyze and evaluate the students' singing performance, so that students can more accurately realize that there are problems in expression and singing posture.

3. Experiment

3.1. Subjects
The object of this experiment is the students of music major in a university, so as to conduct a sampling survey. Through the questionnaire survey of some students, we can find out whether the students are satisfied with the application of computer technology in vocal music teaching, and what are the advantages and disadvantages. Finally, we collect the data, integrate the data, and analyze the shortcomings of the current computer technology in vocal music teaching, and what aspects need to be carried forward. The questionnaire survey is conducted on the music majors of four grades from freshmen to seniors. There are 50 students in each grade. The ratio of male and female is 1:1, and the total number is 200. Through the conclusion of data analysis, this paper puts forward appropriate suggestions for the application of computer technology in vocal music teaching, and provides new ideas and directions for the application and development of computer technology in vocal music teaching. Let it develop better, at the same time, let teachers and students enjoy the application of professional services in the field of vocal music teaching under the background of the computer era, and improve the teaching experience of college students.

3.2. Experimental Design
The paper questionnaire was used in this experiment. The questionnaire was edited and distributed to all selected investigators. There are 200 copies of this questionnaire, and 200 copies are actually collected. The questionnaire investigated the satisfaction of individualized teaching and the convenience of vocal music computer system. The questionnaire will be collected for data processing and analysis, using statistical and comparative methods to get the current students' views on the application of computer technology in the field of vocal music teaching, so as to find out the development problems of the application of computer technology in the field of vocal music teaching under the background of computer era. Based on these problems, we can find out the new breakthrough of the application of computer technology in the field of vocal music teaching.

4. Results

4.1. Test Investigation Results

![Figure 1. Is individualized teaching satisfactory](image-url)
Figure 2. Is vocal music computer system convenient

From the data analysis in figure 1, we can see that there are still big problems in the current personalized teaching, and there are not a few students who are not satisfied with the current situation of personalized teaching. Only a few students are satisfied with the current situation of personalized teaching. Most of them think that the current personalized teaching is good or not bad, but more satisfied or general. From the data in the figure, it can be seen that the application of computer technology in the field of vocal music teaching cannot make the majority of teachers and students realize that the school's innovative teaching methods need to be improved.

From the data analysis in figure 2, we can see that there are some problems in the vocal music computer system, which affect the students' use experience and give them more opinions on the school vocal music computer system. School vocal computer system to better let students have a better experience, we need to overcome these problems, to bring these students a better teaching experience, in order to make the student teacher better learning, improve their ability, so that the school can also develop better.

| Table 1. Are male and female students satisfied with individualized teaching |
|---------------------------------|-----------------|-------|-------|-------|
| degree | satisfaction | good | general | Not satisfied |
|-------|-------------|------|---------|---------------|
| male  | 15          | 20   | 29      | 36            |
| Female| 30          | 24   | 27      | 19            |

According to the data from the questionnaire survey in Table 1, there are gender differences in the degree of satisfaction with personalized teaching between men and women. Girls are relatively satisfied with personalized teaching compared with boys. Most of the students in the survey are not satisfied with personalized teaching. There are many boys who are not satisfied with personalized teaching. Therefore, gender will have a very different degree of satisfaction with personalized teaching in Colleges and universities, which is also an important factor we learned from the survey results. Therefore, in the construction of personalized teaching, we should consider more boys' ideas, which will be of great help to the application and development of computer technology in the field of vocal music teaching in Colleges and universities.

5. Conclusion

With the development and progress of computer technology, computer technology is widely used in the field of vocal music education in China. Modern technology has important practical value in promoting educational reform and changing educational concept. The application of computer technology in the field of vocal music education will definitely improve the quality of vocal music
education. College vocal music education should also adapt to the times, can no longer stand still, can no longer use the traditional single mode of education. In the era of rapid development of computer digital technology, college vocal music education will become the dominant position. The integration of new elements of computer technology into vocal music education is an important breakthrough in the mode and method of college vocal music education.

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