The Significance of Computer Assistance Based on Opera Rehearsal in the Vocal Music Teaching of Baroque Opera

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Abstract. The artistic form of opera rehearsal was formally formed in Baroque period. Its singing style, method and cultural connotation have a profound impact on the singing, arrangement and performance of modern opera. In the specific teaching practice, from the perspective of rehearsal, verify the unique value and significance of computer-aided opera rehearsal, reflect on the problems existing in vocal music teaching in domestic art colleges, and prove the important role of computer-aided in modern vocal music teaching and the significance of its culture for our modern people.

Keywords: Baroque Opera, Vocal Music Teaching, Opera Rehearsal Angle, Computer Assistance

1. Introduction
The performance and teaching of opera works in the Baroque period are scarce and unpopular in domestic professional academies and music schools. However, as the beginning of the history of Western opera, Baroque opera plays an important role in the entire Western music history. In addition to Italian composers, the most famous composers of the same period, including Purcell of England and Handel of Germany, composed the works not only representing the typical style of Baroque opera, but also attracting worldwide attention because of its unique aesthetic value[1-4]. As the masterpiece of Purcell's musical drama talent, "Dido and Aeneas" combining Italian, French, and British factors, became the first great British opera, and also one of only two operas existent in Britain in the 17th century The works include French overtures, a large number of ensemble and chorus and dance, highly effective recitatives, tragic arias known as immortal masterpieces, the biggest feature of the whole drama is the subtle combination of lyrics and language rhythm and tone, highlighting the English pronunciation and tone. The oratorio "Charisma" is a drama oratorio in English created by German-English composer Handel, which is sung in English, belongs to the Baroque semi-opera. This form is Handel's most creative contribution to the music art. This work is mainly based on the Italian music style, but also involved with French, British and German factors. The most unique thing is that some tenor voices were sung by castrato or female singers at that time. The recitative and aria in the play are combined and converted just right. The chorus is always at the center of the work and participates in the development of the storyline; the high drama of the work comes from the composite result of the chord and polyphony, and the unique perspective in composer 's handling of religious subjects. Therefore, learning and mastering Baroque operas, especially operas and oratories such as "Dido and Aeneas" and "Charisma " is a must for every opera performer, as well as the splendid
experience of artist's brilliant resume, meanwhile, it should become an important content in vocal and opera teaching.

2. Computer-aided research on vocal teaching in Baroque opera

However, reviewing the course of vocal music teaching in domestic art colleges since the founding of New China, currently the following major problems exist: First, pay attention to the classical celebrated work and famous music with rich materials while ignoring the essence of Western music in the Baroque period, which is lacking in literature; Second, pay attention to individual solo skills while ignoring the ability to cooperate with many people; third, pay attention to the melody singing of aria while ignoring the recitation dialogue of recitative; fourth, pay attention to Italian, French, German works while ignoring English works; Fifth, pay attention to the popularity of the work and the difficulty of singing while ignoring the training of musicality and basic skills of the works; sixth, pay attention to the number and skills of singing, while ignoring the quality and aesthetic experience of singing; seventh, pay attention to the sound conveyed on the surface of the score while ignoring the cultural spiritual connotation contained in the works. Therefore, the above two works for rehearsal are selected for rehearsal, performance and display as teaching achievements, which can be regarded as a method to solve or alleviate the above teaching problems, and it is imperative. However, because the original works of these two operas were all accompanied by Baroque bands, and this combination of ancient Western bands rarely appeared in China, the biggest obstacle to the rehearsal and even the final performance on weekdays was that the Baroque band could not appear properly. For this reason, the computer assistance in terms of opera rehearsal, which is one of the main methods of vocal music teaching, plays an important role. So, how does computer assistance from the perspective of opera rehearsal work?

There are $n$ evaluation objects $u_1, u_2, \cdots, u_n$. A multi-index evaluation system consisting of $m$ indicators $x_1, x_2, \cdots, x_m$, $x_{ij} = x_j (x_i) (i = 1, 2, \cdots, n; j = 1, 2, \cdots, m)$ is the evaluation data matrix (decision matrix) of the observed object $u_i$ regarding the observation value of the indicator $x_j$

$$A = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1m} \\ x_{21} & x_{22} & \cdots & x_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ x_{n1} & x_{n2} & \cdots & x_{nm} \end{bmatrix}$$ (1)

Among them, the data in $m, n \geq 3$, $A$ is normalized data after preprocessing.

The song style analysis process we describe as a general transformation

$$y_i = f \left( x_{i1}, x_{i2}, \cdots, x_{in} \right), i \in N$$ (2)

Although the computer-assisted prosperity in the opera rehearsal is closely related to the art songs existing as independent art forms, and it emerged from the early chamber music performances through the art songs, precisely from the 19th century by Schubert through the period of romanticism. However, the early vigorous development of keyboard instruments, especially the predecessor of the modern piano, including the harpsichord and wedge harpsichord, began to develop and reached a considerable level since the Baroque period. Whether as a bass part of continuo in a trio sonata or in a band of Baroque opera, the harpsichord becomes the main instrument. It is worth mentioning that many Bach piano works performed by modern pianists are actually adapted from predecessor pianists. Most of the original versions were actually created for pipe organs or ancient pianos. However, the use of modern pianos instead of ancient pianos to play Baroque works has the following advantages and disadvantages: on the one hand, modern pianos help us restore some of the appearance of Baroque classics, on the other hand, some difference from original works exist because of the difference in the shape of the instrument. Based on the importance of the harpsichord in the development of the Baroque band and its scarcity in professional institutes at all levels, including music museums, especially in the teaching of music education, we have no option but to use modern pianos instead of
ancient pianos or even Baroque bands in Baroque vocal music teaching, its significance is just like that in modern society, the piano as a contraction of the symphony orchestra in the classical and romantic period, has become the best way to help actors complete opera rehearsal same[5-6].

3. Results and analysis of example

"Dido and Aeneas" is the first great opera in Britain. It was originally the script of the British laurel poet Tate, combining literariness and musicality. Composer Purcell was an excellent singer at that era, so this piece of work has a more reasonable vocal design than other operas, and it is a rare masterpiece for students to practice singing and improve technology. There are not many characters in the play, and the performance time is not long, which is convenient for students to control. The band uses stringed instruments and basso continuo to reproduce the Baroque style of music together with the singing part. As shown in Figure 1.

![Figure 1. Teaching scene of Dido and Aeneas music](image)

In terms of historical dimension, domestic vocal music teaching has always focused on Italian, French, and German music. No specific teaching requirements for English works are specified, which makes students miss the opportunity to learn and understand classic works. "Dido and Aeneas" and "Charisma" were introduced into the teaching of vocal music and opera, thus breaking through the dilemma of the lack of classical English vocal works in art college education. Since these two works are mainly based on Italian style, yet they combine the elements of Britain, France and Germany, so we can say literally they are truly international comprehensive works. They are both in the same historical period, also in English pronunciations. This connection is convenient for students to familiarize, recognize, consolidate and deeply appreciate the musical style and aesthetic charm of Baroque works. The computer aid of the opera rehearsal angle plays a leading role in the overall situation in the vocal homework class and group rehearsal stage in these two works. See the following for an example of the author's teaching practice in the Central Conservatory of Music.

From the interval frequency statistics table, it can be seen that in the C section, the interval of the semitone number 0 is the highest, followed by the interval of the semitone number 2, 3, 5, and the frequency of the semitone number 1/4 is lower, The lowest is a half-tone interval of 6. According to the vibration ratio between sounds, the degree of concordance of the semi-tones containing 0-6 intervals can be expressed as figure 2:
First of all, by selecting the role of opera among all students, we encourage each student to actively refer to the literature, familiarize with the plot, concentrate time and energy in learning the language and pronunciation rules, and use this as an opportunity to make the students widely understand and experience musical style of the Baroque opera, and compare the Baroque opera with the classical and romantic operas that come down from it, and finds the macroscopic differences between the three, such as the differences in musical structure and melody characteristics and emotions. Then, relying on the computer-assisted opera rehearsal angles and one-to-one class of vocal music students in traditional vocal teaching, through the actual acoustics to help students further familiarize themselves with characteristics of the roles, practice singing, and overcome technical obstacles in music.

Secondly, the same roles are divided into several groups for rehearsal. Under the guidance of the computer-assisted perspective of opera rehearsal, the cooperation ability between students, students and conductors and directors are improved. Through the training of ensemble, chorus and dance movements in the play, students are trained to balance and coordinate in music performances, mainly including the control and debugging of their physical fitness and tacit cooperation with others, in order to immerse students in music and opera computer-assisted participation in rehearsal angles throughout the rehearsal including dance and lines.

4. Conclusion
Using Baroque opera as the teaching content of vocal music not only enables students to enter the western Baroque art that is far away from real life, to but also learns the style characteristics and aesthetic characteristics of early operas, to learn the style and aesthetic characteristics of the early opera, but also helps them to learn the most basic and most important in vocal singing skills, master the vocal techniques that are not often contacted, learn how to interpret the plot and character through the cooperation with chorus, accompaniment, conductor, director, and vivid and realistic stage performance, interpret the plot and character, and lay a certain foundation for becoming a professional actor or engaging in education in the future. Wang Yunpeng, a young baritone singer in the United States, was a graduate student of Central Conservatory of Music in June 2012 and won three awards in the 20th Domingo World Opera Vocal Competition. His previous opera singing experience came from only one "Dido and Aeneas", which shows that this opera contains rich singing skills and music content, it can lay the necessary solid foundation for the singer to become a professional singer. Baroque music has already become a milestone in early Western music. The international music industry has specialized performance groups and research institutions with Baroque music as the main content. The Baroque Chamber Orchestra of China has also started. Rehearsal and performance of

![Figure 2. Song interval analysis](image-url)
Baroque opera are important teaching content in professional art schools, integrating the academic value, artistic value, aesthetic value and cultural value, and the computer aid of the opera rehearsal angle is undoubtedly showing positive dominance in the vocal work and group rehearsal before opera combination, it plays a bridge role in the integration of new and old people and ancient music, highlighting the pivotal significance.

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