Optimization of Music Teaching Methods Based on Multimedia Computer-aided Technology

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Abstract. Teaching informatization improves the quality of teaching and enhances the service ability and teaching management ability of teachers. Accelerating the development of information technology can promote the pace of music teaching innovation. "Computer Multimedia + Music Teaching" allows teaching information to connect with basic teaching, and supports the reform and development of music classroom in practice. This article elaborated from cross-border connection optimization relationship and music teaching data. The characteristics of computer multimedia music teaching are analyzed from the connection between music teaching and computer multimedia and the optimization of computer multimedia methods in the music teaching classroom. By analyzing the optimization of music teaching methods, the application of computer technology in basic music teaching is explored, and the positive effect of computer technology on music teaching is explained.

1   INTRODUCTION

With the continuous development of the teaching revolution, extracurricular teaching such as music has become a very important part of quality teaching [1]. In the course of music teaching, teachers need to arouse the enthusiasm of students to learn music, strive to change the boring and tedious nature of the traditional teaching model, and innovate the teaching content. With the continuous development of computer technology, computer networks have become the main technical means for the development of auxiliary teaching systems, which can well realize the development of teaching auxiliary systems and provide full support for the teaching process [2-4]. At the same time, the computer network can provide in-depth technical support for teaching courses and other deep-level things. At present, most colleges mainly use the teaching of computer music courses to assist the teaching of traditional composition theory courses, such as basic theory courses, composition, sight-reading and ear training, and orchestration. This greatly satisfies the students' absorption of musical elements such as timbre, pitch, harmony, modern rhythm, band ensemble, concerto, symphony and even the overall music composition. The focus of

this auxiliary course on computer music is the use of software, mainly the operation of sequence software. For the teaching of computer music production students, the configuration of such learning machine system hardware has greatly hindered the progress of this course. Sani et al. [5] believe that teachers engaged in digital music teaching can be divided into two categories, one is professional teachers, and the other is teachers who participate in teaching based on their personal hobbies. Hinterlong [6] pointed out that the latter accounted for more than 99% of the total number of teachers. At present, among professional teachers, the number of computer music majors is very small, and most of them are similar science recording professionals. Almasseri and Mohammed [7] pointed out that from the perspective of students studying, they can be divided into two majors and the general music major. Therefore, the teaching methods adopted should also be different. From the perspective of various institutions, the overall effect is not good, and the classification is not scientific. From the perspective of colleges and universities, the teacher class also enrolls music performance students, so there is little difference in this respect. Stenhouse and Nancy [8] believe that it is mainly the difference between professional and "non-professional". For students majoring in computer music and recording, the curriculum structure should be systematic. The main courses, auxiliary courses, and elective courses should be systematic. For non-professional students, the main focus is on practical applications and auxiliary teaching. Tan [9] points out that the country where the teaching aid system is strongly supported is the United States. Therefore, the development of the United States is relatively rapid. Many colleges and universities have conducted digital management of teaching management and added the development and construction of teaching auxiliary systems. In the middle of the last century, foreign and multinational institutions began to work on intelligent computer-aided teaching systems. With the continuous development and maturity of streaming media technology, many foreign countries are developing a distance teaching system based on multimedia technology. In this distance teaching system, the most important part is to pass on the teaching content of teachers to student clients. In this transfer process, the transmission of data has diversified, including different data forms such as text, sound, pictures and video. Brunkan et al. [10] pointed out that schools and companies in many countries have successfully run remote teaching systems through advanced technologies such as flash and real system, which has brought a new technological revolution to the development of teaching systems. Exploring a new music teaching service model is also a requirement for the development of information technology. This article studies the characteristics of "computer multimedia + music teaching". The addition of computer multimedia has transformed the basic elements of classroom teaching into information-based teaching that integrates new methods such as teaching content, computers, network facilities, teachers, students, and teaching platforms. Computer multimedia teaching will comprehensively introduce information technology as a means of implementation in the process of technology teaching.

2   ANALYSIS OF THE CHARACTERISTICS OF COMPUTER-ASSISTED MUSIC TEACHING METHODS

2.1   Cross-border Connection Optimization Relationship

Music has breadth, it can be connected to anything. Cross-border, here can refer to interdisciplinary connection, can also refer to cross-regional connection through computer multimedia. The lack of attention to the curriculum has made music teaching resources scarce has become the norm. Computer technology seems to be two disciplines that are not in harmony with the elegant art of music. The development allows the mutual application of teaching and intelligent technology and big data technology to form a cross-border connection. The teaching resources in developed regions are gradually introduced to the western region, so that the lag in the development of music teaching in the central and western regions begins to gradually improve, and enjoy the excellent teaching resources in the society. The biggest advantage of computer multimedia lies in online teaching. Online teaching connects to computer multimedia to enjoy the

teaching mode of excellent teachers. The flow of knowledge acquisition is accelerated, the visual effect is better, the connection is stronger, and the interaction is higher. "Paper" turned to "Internet" to save teaching costs. Driven by computer multimedia technology, the construction of integrated teaching materials combining online and offline resources will become an inevitable trend of development. The use of computer multimedia connection, the use of platform interactive training, combined with the weakness of children's musical skills, targeted music training. When children encounter problems that they do not understand, they can also get guidance from their teachers in time. The model diagram of the deep integration of information technology and music teaching is shown in Figure 1.
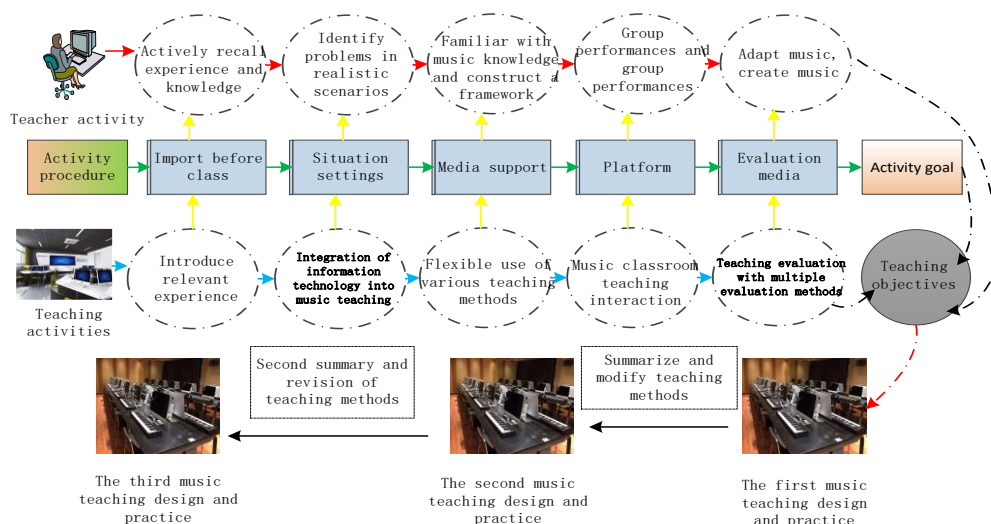

Figure 1: Model diagram of deep integration of information technology and music teaching.

The innovative teaching mode of computer multimedia drives the development of music teaching. The mode of music teaching can be connected with micro-classes, and can also be used to flip classroom teaching. Of course, VR live people can be used to simulate the classroom online, and artificial intelligence can also be put into music teaching. Micro-classes can simplify, segment and clarify music classrooms; flip the classroom to advance music teaching and make students learn autonomously; VR live online classrooms are real and visual. These teaching modes stimulate the interest of the classroom and drive the development of teaching. "Computer Multimedia + Music Teaching" not only optimizes the relationship between students and classrooms, but also makes the shutdown of teachers and students closer. The role of teachers has changed with the change of classroom format, teachers are no longer the authority of the classroom, and the relationship between students and teachers has changed from respecting teachers and teaching to "friends". Of course, the change of teacher 's identity optimizes the relationship between students and teachers, and the atmosphere of the teaching classroom. It also optimizes the original music teaching method of original knowledge transfer to the way of independent learning. The school 's teaching is changed from independent individuals to cooperative ones.

Computer multimedia emphasizes the design of internal structure, and its internal "nerve system" requires organic integration. This "neural system" includes a computer multimedia platform and internal subsystems. The development of computer multimedia has driven the establishment of smart campuses and smart classrooms, and smart classrooms based on technologies such as networking, natural interaction technology, and multi-screen interaction technology. To expand the development of music teaching through smart campuses, smart

campuses, as the name suggests, are smart campuses, where wisdom exists in the human brain. Smart campuses create a multi-dimensional multi-neural system integrated network like the human brain. Such a complicated computer multimedia system is connected to each campus and enjoys the music activities held in each campus in real time. It constitutes a good music interactive platform, opens the door of each campus, and allows students from other schools to realize the variety of music teaching. A schematic diagram of a computer-aided search engine for music teaching is shown in Figure 2.
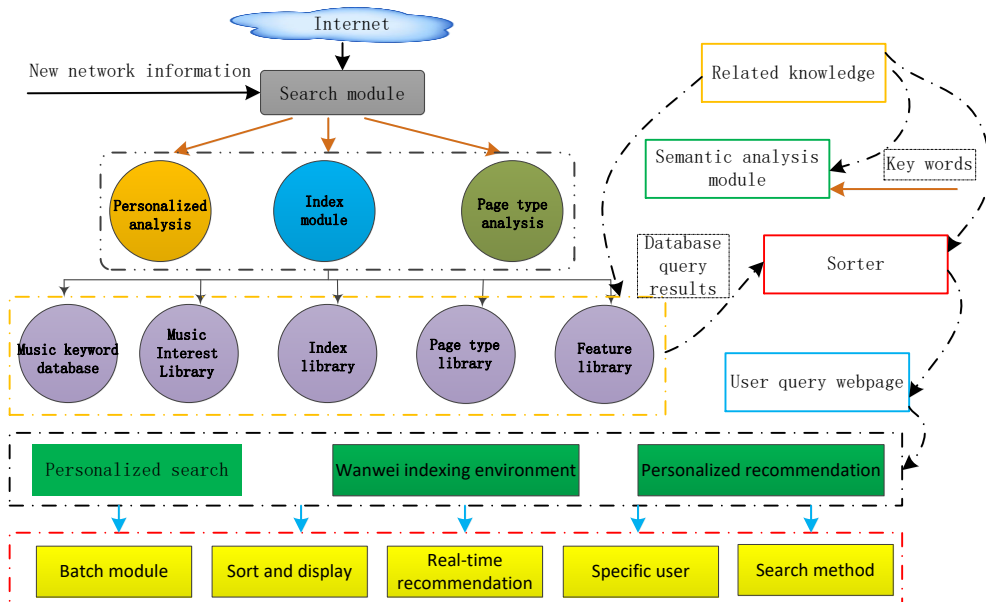

Figure 2: Schematic diagram of computer-aided search engine for music teaching.

People are tired of work and the pressure of life. They have not fully realized the benefits of music teaching. People's understanding of music teaching is only on the surface. The uniqueness of music teaching only shows up with the passage of time, so that people have no time and no experience to wait for it to grow, and the drive of interest makes people only focus on the present and ignore the future. The "Computer Multimedia + Music Teaching" has basically started, expanding the development of open music teaching.

2.2   Optimizing Music Teaching Classroom with Computer Multimedia

Computer multimedia is a multi-dimensional thinking, a three-dimensional thinking that is rich and entwined. It is as complex as the human brain's neural thinking and as fast as the human brain. Brain thinking is constantly moving forward, and the external basic equipment of computer multimedia and the innovative teaching service model create different school-running systems and break through the traditional teaching gap. Creating a school with computer multimedia thinking has also broken people. The sense of distance between teachers and students respects the personality development of students from the perspective of teachers, and satisfies the teaching system of poor, middle, and excellent classes. The way of teaching is also from the school. The organized single classroom has developed into a multi-dimensional classroom, creating a multi-dimensional space for students to learn flexibly and communicate and interact flexibly.

You use computer multimedia to build a platform for school art teaching, make the role of teachers more three-dimensional, and build a platform for students' self-development. Teachers

have not been replaced but become the guides in information teaching. When the students are sparse for the vast knowledge system, the teacher reminds the students to choose knowledge learning in a targeted manner, not to blindly want to learn everything and want to see. In this mode, in the process of "purchasing" knowledge, the teacher is more like a "shopping guide". The student completes the selection and learning of knowledge under the guidance of the teacher. The student's learning is more personalized. The role and positioning of the teacher with the change, teaching and learning are different from the previous methods.

It is worth noting that under the computer multimedia mode, the teacher has not lost her original value. The formation of students' knowledge structure, the shaping of personality, and the formation of values are closely related, and these are inseparable from the teacher's guidance. The role of teachers is not limited to the grasp of knowledge, but more importantly, it involves the choice of knowledge, which is related to the life planning of students. The combination of tradition and informatization teaching respects the individualized cultivation and development of students, highlights the importance of teachers. This is the important direction of "computer multimedia + music teaching". The music teaching mode supported by computer multimedia is shown in Figure 3.
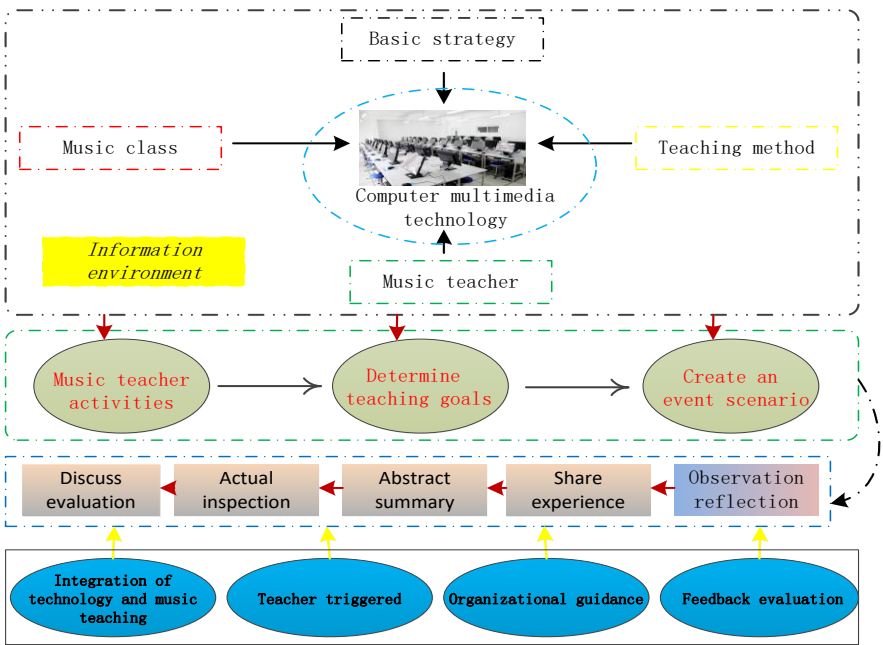

Figure 3: The learning model of music teacher students supported by computer multimedia technology.

2.3 Data Generation for Music Teaching

There are three major problems that schools may face in the process of data analysis and use: they cannot use data in different fields, they cannot make effective decisions, and they lack advanced data analysis tools. The purpose of data governance is to discover value. At the same time, high-quality data can also support the high value of data. Under the guidance of this idea, the value-oriented music curriculum data program "University Data Governance Activity Domain, Output and Tool Chain" is proposed, which includes 5 major activity areas: data integration and cleaning, continuous improvement of data quality, and data relationship combing, data mining and prediction, data visualization. For the relationship between the field of data governance activities and other fields of business activities in universities, the former provides the basis for decision-

making and business optimization for the latter, and the latter provides data sources for the former.

With the modernization of teaching, we have clearly realized that people's teaching methods are also changing. Big data is based on computer multimedia, high-end data processing and analysis of useful data value. The development of music teaching is inseparable from big data. After investigating the four main subjects of teachers, teaching content, students, and teaching platforms, we use big data to analyze the requirements and values of potential music teaching development. Data is the most "real person" who will not lie. To develop music teaching, we must cooperate with big data technology, extensively collect resource data in teaching, and understand what is missing in the classroom and students' requirements on the "computer multimedia + music teaching" platform. Detailed statistical analysis of the problems improves the evaluation of music teaching quality. The transformation of basic teaching modernization has actively adapted to the diversified needs of the recipients for lifelong learning. The difference in teaching resources, the quality of teaching, and the level of teachers in the developed and developing regions of the country directly affect the balance of teaching development. Under such an imbalance, music teaching has become a weak subject and the development is not sound. Compared with the main subjects, the student's learning status of music is not worth mentioning. Therefore, the development of music teaching needs the help of computer multimedia to speed up the coverage and increase the school's attention. The data distribution of music activities students like to participate in is shown in Figure 4.
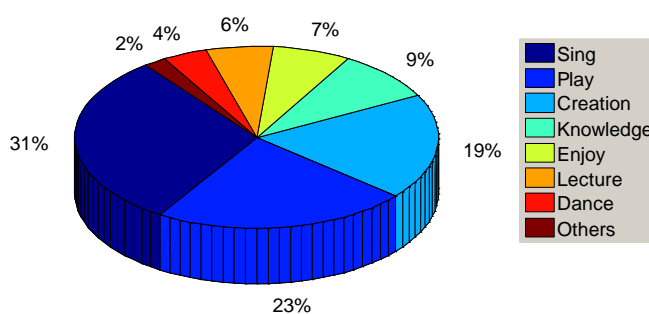

Figure 4: Data distribution of students like to participate in music activities.

Computer multimedia mode teaching can promote the development of music disciplines. First, the combination of computer multimedia and music teaching facilitates the demand for music. Music teaching requires teachers to integrate music resources in many ways, and computer multimedia provides convenient and rapid resource integration support for music teaching. Of course, "computer multimedia + music teaching", while allocating teaching resources reasonably, also needs to realize the rational allocation of teachers. The primary task in this configuration process is to train teachers on computer multimedia technology and cloud technology. Generally, music teachers only pay attention to the improvement of self-technology, and ignore external learning to improve the application of music teachers in computers, which has become the top priority of computer multimedia + music teaching. Now that primary and secondary schools are advocating interdisciplinary collaboration, the connection between two seemingly disparate disciplines, music and computer, requires music teachers to possess high-quality teaching qualities and self-reinforcement of computer knowledge to promote the development of music teaching. This kind of learning can also better develop and innovate for teachers' integration and innovation in music and computer multimedia. In general, the combination of computer multimedia and music disciplines as an emerging discipline model, it is necessary to develop music teaching on the basis of the information teaching experience that has been explored.

3 APPLICATION OF COMPUTER MULTIMEDIA TECHNOLOGY IN THE OPTIMIZATION OF MUSIC TEACHING METHODS

3.1 Optimization of Computer Multimedia in Sight-Singing and Ear Training

The content of ear training mainly includes monophony, interval, chord, rhythm, melody and so on. Because the abilities of primary and secondary school students are different, melody is relatively difficult for primary and secondary school students, so melody listening is not included in the teaching scope in basic music teaching. Interval training mainly includes melody interval and harmony interval exercises. The basic music teaching is mainly based on the melody interval, and a simple harmony interval is added for the upper grade students. The purpose of interval training is to establish the pitch concept of intervals, listening to quasi-tones, and singing quasi-tones. Interval training can lay a good foundation for chord training, and can also allow students to be exposed to tonality early and be closely related to musical theory knowledge. In regular training, teachers usually give students a crown sound on the first pass and listen to the root sound on the second pass. Because there are many transposed chords in the chord dictation, the training of chords should be fully connected with the knowledge of musical theory. In the teaching of basic music, the recognition of chords usually requires students to recognize the nature of the chords. The major chord or the minor triad can be heard without having to hear the specific singing name. First of all, before the chord dictation training, the teacher will let students sing a large number of chords, starting from the bass, and sing upwards in order to feel the color of the chords. Second, teachers usually let students judge the nature of chords according to the color of the chords. In the process of model singing, the teacher introduces the audition of the major and minor chords to the students, which is also one of the most commonly used teaching methods. The sequence diagram of pitch of computer multimedia assisted teaching is shown in Figure 5.
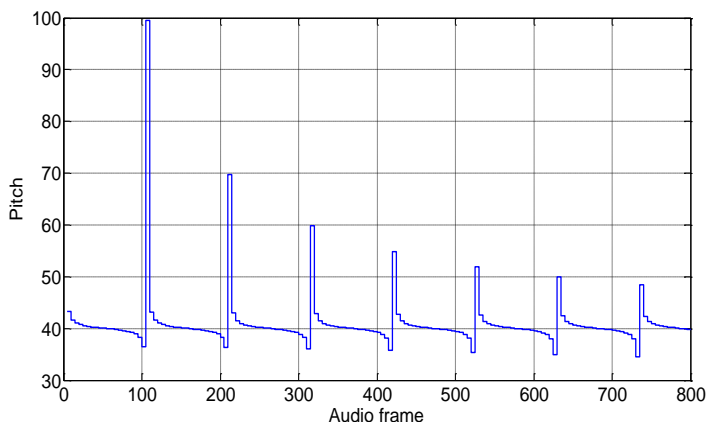

Figure 5: Pitch sequence diagram of computer multimedia-assisted teaching.

Sight singing is the accurate and vivid sound reproduction of the notation of music notation, so as to establish correct music hearing and guide students to obtain the correct musical aesthetic orientation. The most basic way to build and accumulate music language is also the most direct manifestation of the overall music performance.

When conducting multi-voice training, the teacher divides the students into groups for training. Common multi-voice sight singing mainly includes two parts, three parts and four parts. For example, in the two-part visual singing, students are divided into two groups to sing, and after singing well, the two groups are reversed for visual singing. In the process of sight-singing, students should pay attention to the melody of each other's voice while singing their own voice. The three-part and four-part sight singing are also practiced in groups, and then the parts are

exchanged to make the students familiar with each part. The time-aligned pitch sequence matching diagram is shown in Figure 6.
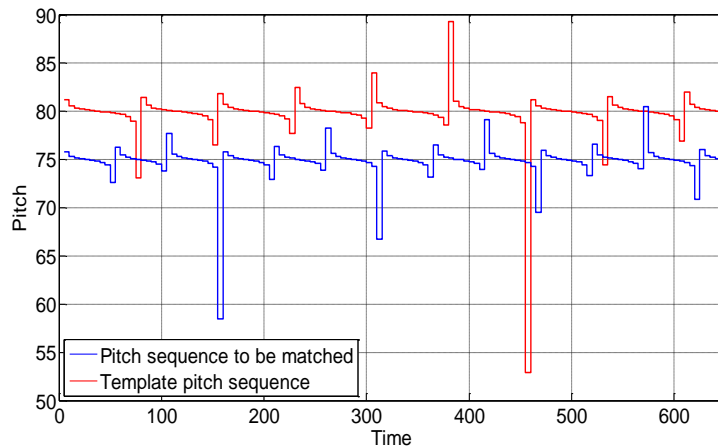

Figure 6: Time-aligned pitch sequence matching diagram.

We make use of computer music production technology to edit and sing, enrich teaching content. We will fix a textbook in sight-singing and ear-learning, and the sight-singing songs are very limited. In order to allow students to better develop their listening skills and improve their reading ability, a lot of practice is required. Due to the limitations of textbooks, students have no more practice space. In order to enrich the sight-singing training, computer music production technology can be used to produce sight-seeking tracks in other textbooks, so that students do not have to waste money to buy other textbooks; teachers can also write sight-seeking tracks by themselves, allowing students to feel different styles. Sight singing makes the teaching of sight singing clearer and more convenient.

3.2   Optimization of Computer Multimedia in Music Theory Knowledge Teaching

In the music textbooks of primary and middle schools, in addition to learning songs, there is also an important point-music theory knowledge. We know that music theory is a basic course in music learning, and it is conceptual and thinking. Students have a certain sense of fear about learning music theory. If they teach music theory in large amounts in the classroom, students will find it difficult to accept. In the music textbooks of elementary schools, the knowledge of music theory is greatly compressed, which requires teachers to not only give a comprehensive lecture, but also make students accept with full interest. In today's music class, there are two completely different phenomena: one is that the teacher will explain the music theory knowledge from the beginning to the end according to the traditional teaching method, stay in class work, and conduct special assessment at the end of the semester. Second, students think that music theory knowledge is boring and tasteless, just like learning mathematics, which leads some teachers to never teach music theory knowledge in teaching in order to allow students to spend music lessons happily and easily. This is completely irresponsible performance.

The method of teaching music theory is more traditional. Although this method is correct and has achieved great results, this method is no longer suitable for this fast-growing society. Today's primary and secondary school students are very agile in thinking and it is difficult for them to accept this "old-fashioned" teaching method. Teachers can use computer music technology to play the songs they want to teach at any time. The application of computer multimedia aided theoretical teaching methods is shown in Figure 7.
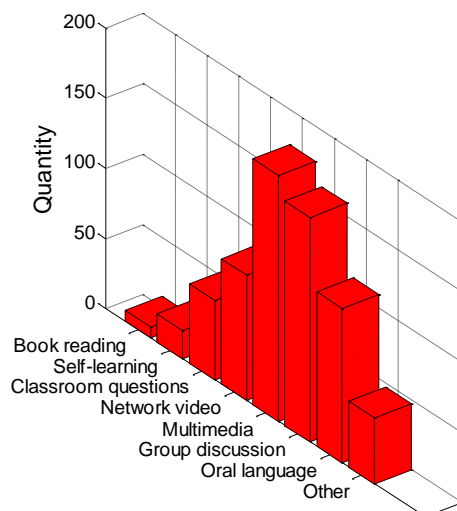
Figure 7: The application of computer multimedia-assisted theory teaching methods.

Using computer music technology can raise students' interest in music theory knowledge, theoretical knowledge can be well consolidated. Music theory is different from other subjects. It is a subject that combines notes and words. In teaching, many notes are written. Using computer music software, teachers can use the music notation software to input the scores and text to be used during lesson preparation, so that students can more intuitively understand the knowledge of the entire lesson, and can also achieve a very beautiful effect. The time for copying music scores improves teaching efficiency.

3.3   Optimization of Computer Multimedia in Music Appreciation Teaching

The application of computer music technology in appreciation classes can expand students' knowledge and improve teaching efficiency. Computer music technology can convey knowledge to students very vividly when applied, which is unmatched by traditional teaching. Just like enjoying an opera, using computer technology can make the whole lesson more pleasant and achieve perfect results. The use of computer technology can make the theoretical knowledge in music appreciation more visual, and can also make the music score and lyrics perfectly combined. Students can learn in a happy mood, greatly enhancing students' enthusiasm and initiative in learning. At the same time, teachers will enrich the content of the classroom according to the students' ability to accept and improve the teaching efficiency.

Teachers act as organizers, mentors, and promoters of the entire process. This teaching model is a very good way for modern teaching, contributing to the cultivation of talents, and fully reflects the information age features. We let students become the center of learning and active participants, choose to use their own learning content according to personal music level, personal hobbies and personal abilities, sort out the knowledge of the entire class, and form a unique perspective. Figure 8 shows the interaction diagram of music appreciation grades and genders with the help of computer multimedia.

Computer music technology is used in music appreciation classes, and it can complete the teaching of music. The teaching tools used in most music appreciation classes today are mainly pianos and CDs. In the classroom, teachers have to switch teaching tools according to different contents, which wastes a lot of time. In the music appreciation class, you need to listen to a piece of music multiple times and then make a detailed analysis. In the traditional teaching mode, you can only play from scratch over and over again, without any innovation and contrast, boring and

tasteless. Using computer music technology, teachers can set different playback methods according to teaching needs, and can choose to start at any time period.
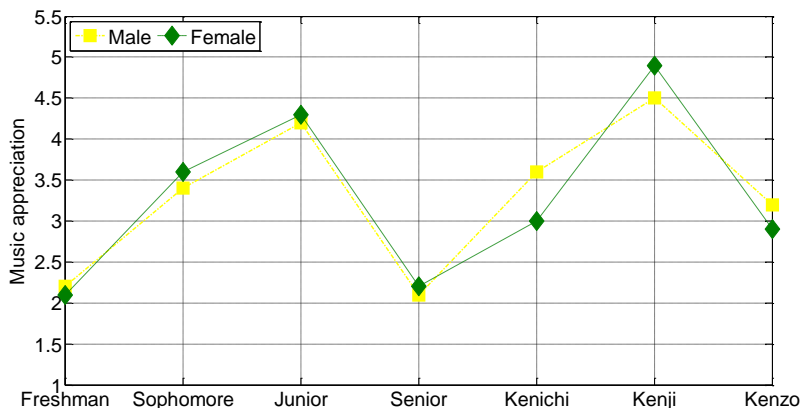

Figure 8: Computer-assisted multimedia interaction of grade and gender of music appreciation.

4   CONCLUSION

The teaching of computer multimedia and music complies with the requirements of the times. The state vigorously promotes the construction of "computer multimedia + teaching". Schools everywhere are actively investing in the construction of computer multimedia campuses. All regions are also collecting excellent teaching resources. Through the construction of the computer multimedia teaching platform, the computer multimedia teaching system has gradually formed, which has also brought high-quality resources for music teaching. This article analyzes the characteristics of "computer multimedia + music teaching". The cross-border connection optimization relationship, computer multimedia means optimization of music teaching classroom and music teaching data characteristics are analyzed. The optimization method of combining computer technology and basic music teaching also requires schools to have good teaching equipment and teaching environment, and teachers must have the basis of computer music production knowledge, and can use computer technology very scientifically and effectively so that they can produce good teaching content. According to the current situation, due to the limited teaching conditions, this teaching method has not been widely implemented, and can only be used in schools with good teaching conditions.

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