Research on Music Education Model by Using Computer Music Technology in Colleges

Yang Zhou*

Music Education College of Guangxi Arts University-Nanning, Guangxi Province, 530022, China

*Corresponding author email: 20170020@gxau.edu.cn

Abstract. Against the background of new teaching conditions and the rapid development of computer technology, computer music technology serves as the important method in modern music teaching. The object of this article is to have a study of the methods and models of university music education under the reform of technology in computer music. In this article, students majoring music majors and non-music majors of the Art University are the subject of the survey. They are divided into professional classes (N=50) and non-professional classes (N=50). The professional classes use computer music technology for practical teaching, and Non-professional classes use traditional music to teach. After the experiment, the degree of mastery of the music professional knowledge of the two classes and the acceptance of computer music teaching and traditional music teaching methods were investigated and analyzed. The results of the study show that the introduction of computer music production technology can motivate students to participate in learning, allowing students to experience the charm of music and enrich the content of music knowledge in an intuitive and vivid situation.

Keywords: Technology in computer music; Reform in music technology; Music in colleges; Music education.

1. Introduction

Computer music, also known as computer music and digital music, is the product of the combination of computer technology and music art. It was originally originated in the late 1920s, and it has attracted people's attention since it was produced by computer music. They bring sensory impact on hearing. Computer music can be analyzed from two aspects, computer technology and music creation. From the perspective of a computer, computers are used in computer music technology as the control center, MIDI technology and digital audio technology are adopted as the control methods and a language for information exchange, and electronic devices such as synthesizers and samplers are adopted to perform music. Processing makes the music more full and infectious.

Regardless of the educational concept, educational content, or course format, computer technology plays a significant role in the process of education process in music and teaching activities. With the increasing emphasis on education, the application of technology in computer-assisted music teaching practice has become the focus of education. CAI is capable of cultivating students' interest in learning, but also cultivate their innovative thinking ability and enrich the content and form of classroom teaching. However, the development of computers is conducive to music teaching, so the application of science and technology in computer-assisted teaching in music is very important. It can not only bring convenience to teachers, so that they can fairly test the students' vocal learning level, but also enable them to find their shortcomings and correct them in the process of repeated listening and singing, thus laying a solid material foundation for teachers.
With the continuous progress and development of science and technology, various kinds of software in computers are also emerging. Their appearance has brought many conveniences to music teaching, among which vocal singing serves a significant role in music teaching. In the process of CAI, teachers can evaluate and record the students' singing voice through various corresponding recording software, so that they can objectively and directly evaluate the students' singing effects in detail, which is also conducive to the students to adjust their own shortcomings [9]. In the past, universities used traditional teaching methods to teach music courses inefficiently. Incorporating computer music technology into the modern music teaching model is very helpful to stimulate students' musical creativity and enthusiasm, and improve students' understanding of music theory, sight-singing and notation, memory and judgment ability [10].

2. Method

2.1. Using Computers to Create Situational Teaching
The computer-assisted teaching method is conducive to the creation of situational teaching, enabling students to feel the charm brought by music and increase their interest in learning. Computer-aided instruction can also stimulate students' imagination and creativity, enable students to invest in the situation set by teachers in a subtle way, and stimulate students' resonance with music. When teachers teach music, they can play videos or watch pictures with the help of a computer, so that students can fully understand the story behind the music.

2.2. Algorithm Model and Objective Function
This model defines two basic sets of a code and b code, denoted as a and b respectively. Use them to generate a derived set kj and define the attribute X. The attribute x is 0/1 decision variable. If \( x(i,j) = 1 \), the ith class is assigned to the jth; if \( x(i,J) = 0 \), then the class at order i is not assigned to the class at order j.

The objective function of the model is: \( \min = \sum(kj(i,j):x(i,j))(r(i)-r(j))-2 \); it makes the schedule arrangement meet the schedule rules 2 and Rule 3. The first constraint of the model is to limit the decision variable x to 0/1 variable. The second constraint of the model restricts the model to only arrange courses with a weekly duration of 2 hours. If you want to arrange a course of 3, 4 or 6 weeks, you can replace "2" in "s(i) # ne # 2" with 3, 4 or 6. The third and fourth constraints of the model are that when the total number of courses per week of 2 is larger or equal to the total number of classrooms, the course will be arranged for each classroom. And the total number of courses at the time of weekly school hours is less than or equal to the classroom.

2.3. Data Point Density of Computer Music Technology
Refers to the general density of the data space, but also refers to the sum of the influence functions of all data after modeling. The formula can be expressed as:

\[
\text{density}(x_i) = \sum_{j=1}^{n} e^{-\frac{d(x_i+x_j)^2}{2\sigma^2}}
\]

In the above equation, the right Gaussian function signifies the effect of each data point on X; points; serve the parameter in density, which defines the gradient of the density function. It denotes any data object x in the data cluster space, and the distance R in the data, a circular area with the data is regarded as the center and the data distance as the radius, which is consistent to the reachable density distance field of the data object.

\[
R = \text{coefR} \times \text{mean}(D)
\]

In the above equation, coefR signifies the distance adjustment coefficient, and the coefficient value is larger than 0 and less than 1; mean(D) denotes to the average distance of all data objects; D is expressed as the object set of data.
3. Experiment

3.1. Select 50 College Students as the Survey Object
This experiment was conducted on 100 students of the Art University using a questionnaire. Two samples were used, the first one was 50 music majors, and the second was 50 non-music majors. Investigate and analyze the results of these students in three categories: pop music, folk music and classical music.

3.2. Survey on Elective Courses of Music in Colleges and Universities
For the diversity of experiments, we not only surveyed music majors and non-music majors. A sample survey was also used to select the elective courses of music in the secondary colleges of a music school. The directions of the survey were: dance training, choral conducting, pop music, film and television music, folk music, and Western music. In order to understand the situation of students and teachers using computer music technology.

4. Results

4.1. Survey of College Students' Preference for Music Style

Table 1. Survey results of music majors.

| Option settings | Pop music | National music | Classical music |
|-----------------|-----------|----------------|----------------|
| Number of people, | 30        | 18             | 12             |
| Proportion      | 65%       | 12.5%          | 22.5%          |

Table 2. Survey results of non-music students.

| Option settings | Pop music | National music | Classical music |
|-----------------|-----------|----------------|----------------|
| Number of people, | 42        | 6              | 2              |
| Proportion      | 84%       | 12%            | 4%             |

From the survey results in Tables 1 and 2, we can see that the absolute number and relative percentages reflect that both music majors and non-music majors like pop music with modern lyrics and easier to understand, which may be related to foreign cultures. The impact, the impact of the social trends of the times, the acceleration of life rhythm, the vent culture and value orientation of college students are directly related. According to the survey results, the proportion of the two types of students who like ethnic and folk music is relatively low. This result reflects the lack of the identification of the traditional Chinese culture among the college students, and also reflects the colleges and universities' ethnic folk music art culture. Absence of education. As for music majors, the proportion of serious music is slightly higher than that of non-music majors, which may be related to the deep connotation, philosophy and aesthetics of serious music, which requires the appraisers to have certain musical cultural literacy.

4.2. College Students' Survey of Music Elective Courses
As shown in Figure 1, 63% chose dance training, 57% chose choral conductors, 82.6% chose popular music awards, and 77.2% chose film and television music for the multi-choice topic of the most wanted public music course. 33.7% chose folk music appreciation and 22.6% chose Western music history. From this set of data, we can see the types and courses of students' favorite music. The school can increase the courses according to the students' preferences. In addition, it can fully understand the various types of music for the students. Fun, guide students to fully understand music.
4.3. Present Situation and Analysis Results of Computer Music and Music Education in Universities

Computer music is an emerging discipline that has been widely accepted and utilized in our university education after years of development. In accordance with the data, all disciplines of music in normal colleges give courses in computer music to different degrees, which play a significant role in enhancing the teaching in technical manners. For some teaching staffs and colleges and universities with immature hardware conditions, this course is also provided, which shows the importance of this teaching method. However, it is noteworthy that this teaching method, mainly the teaching method for students, must be practiced, or the specific operation process will be soon forgotten, which is nothing else but wasting teaching work. Therefore, as the enrollment scale of colleges and universities is continuously expanding, the number of teachers is gradually increasing, and the requirements on parents are also increasing.

Practice has proved that in the teaching of music theory in colleges and universities, the use of multimedia system can better motivate interest of students in learning, and can update the traditional teaching concepts and teaching methods, which is conducive to enrich the teaching content and improve teaching quality making abstract music theory knowledge more real and vivid, and the quality and efficiency of students in music learning can be improved. In the current university music teaching, computer technology is used a lot, and this technology has also fully played its due role, forming an atmosphere in the school that uses science and technology to improve teaching quality and teaching efficiency, and promotes the use of computer music technology. College music teaching develops in a better direction.

4.4. Results of Student Music Literacy

In the student survey, I found that more than half of the students still love music, and hope to study music in colleges and universities to improve their artistic accomplishment. It is also found in Figure 2 that the percentage of students who have received music training before college is also higher than before, but according to the results of the questionnaire, the students' favorite music theme rankings are: popular music, light music, art songs, symphony, traditional opera. The author believes that the ranking can reflect the music literacy of Chinese students to a certain extent compared with foreign students, especially in the understanding and understanding of traditional music and elegant music. The reason for this phenomenon is that on the one hand, popular music is filled with our living and learning environment every day through TV media, radio, etc. The students hear the most every day is also popular music. Popular music is simple and easy to understand, which can quickly resonate with music beginners. Music, while traditional opera belongs to traditional folk music, it needs systematic professional knowledge to understand the meaning of music, The obscure and elegant art is difficult to cause the emotional resonance of non-professional students who have not been systematically trained. Naturally, they will not like to appreciate. In addition, we do not provide students with an environment to appreciate traditional music. This is something that all walks of life must think about. A problem.
China is a big country with a rich traditional culture and a five-thousand-year history. As educators, we have the responsibility and obligation to spread traditional culture and create a good classroom environment and campus environment to let students understand traditional music and inherit traditional music.

4.5. Computer Music Technology Meets Application Analysis Results

First, as an important basis for computer music production, computer hardware has a severe influence on the quality of the creation of music. In the application of computer based technology for creation of music with the purpose to improve the quality in creation of music, it is necessary to carefully control the music to ensure the adjustment of every detail of the music, thereby ensuring the quality of music production.

Second, the sound card is an important factor in computer music production. After all, the quality of music production depends on the sound. A good sound card can clearly reflect the production effect of computer music, while a bad sound card can only display the effect of music indistinctly, and cannot accurately display the timbre, audio and video of music, which has a very serious effect on production.

Third, the hardware sound source is an important part of computer hardware music production. It has sound library support. In the computer, the hardware sound source usually depends on the computer hard disk to complete the data support. Although the effect is good, there is still a big gap compared with the entire sound library software. Hardware sound sources are more common in electronic instruments. In the application of electronic instruments, it completes the storage and application of related data. However, with the rapid advancement in network technology, the disadvantages of the application of hardware sound sources have gradually become prominent, and its own development has been seriously affected. Hardware sound sources are usually used in some common teaching and activities. Relevant personnel can better control the use of music software and avoid being affected by the network environment. It still plays an irreplaceable role.

Finally, the audio effect is a complete audio system, including compressor, reverb effect and so on. Audio effect devices are very commonly used devices to improve music effects. It is widely used in the development of music production.

5. Conclusion

With the continuous development of computer science and technology, technology in computer based music is more and more widely used in college music education. The quality of music and music effects are constantly improving. The development of the application of computer music technology is inseparable from the education of higher education, science and technology innovation and those who have made great efforts in music technology. In short, with the development of information technology, the combination of computer music technology and music education has brought great convenience to the reform of college music teaching methods. In the original music education and teaching, the limitations of teachers’ teaching conditions have made the teaching content single and boring. With the support of computer music technology, teaching for music in colleges and universities has become real, lively, and active students’ musical thinking. Furthermore, the efficiency of music education in colleges and universities is improved, and the quality of teaching is improved.

References

[1] Miranda E R, Braund E, Venkatesh S. Composing with Biomemristors: Is Biocomputing the New Technology of Computer Music?[J]. Computer Music Journal, 2018, 42(3):28-46.

[2] Bourotte R, Kanach S. UPISketch: The UPIC idea and its current applications for initiating new audiences to music[J]. Organised Sound, 2019, 24(3):252-260.

[3] Dhara P, Rao K S. Automatic note transcription system for Hindustani classical music[J]. International Journal of Speech Technology, 2018, 21(4):987-1003.

[4] Marcella M , Federico A , Rodà Antonio, et al. Inclusive sound and music serious games in a large-scale responsive environment[J]. British Journal of Educational Technology, 2018, 49(4):620-635.
[5] Brown A. MARITIME CYBERSECURITY'S CHOPPY WATERS[J]. Port Technology international, 2018(79):102-103.

[6] Gong S S, Hu W , Ge W Y, et al. Modeling Topic-Based Human Expertise for Crowd Entity Resolution[J]. Journal of Computer Science & Technology, 2018, 33(6):1204-1218.

[7] Dobson E. Talk for collaborative learning in computer-based music production[J]. Journal of Music Technology and Education, 2019, 12(2):141-164.

[8] Fautley M, Daubney A. Some thoughts on curriculum in music education[J]. British Journal of Music Education, 2019, 36(1):1-4.

[9] Salvador K. Equity in Music Education: Sustaining the Courage to Change[J]. Music Educators Journal, 2019, 105(4):59-63.

[10] Austin J R. Promoting Research Partnerships in Music Education[J]. Journal of Music Teacher Education, 2019, 28(2):9-12.