

# The Application and Research of Computer MIDI Technology in Music Education

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**Abstract:** music education is an important part of the implementation of quality education, which is the focus of art education. Traditional indoctrination, teach-in music education is not suitable for the reform of higher education teaching requirements, explore new means of education has become a full implementation of quality education requirements. With the rapid development of network technology, causing the teaching objectives, methods, means a major revolution. The modern educational technology entered into classroom of college music education, which is the only way of music education and teaching reform. Articles about MIDI music production commenced related topics, discussed the current status of music education in Chinese universities, and elaborated MIDI music production in the music teaching. Finally, for the music of the future development and exploration, the author from the ideas, technologies and trends in the future development of music presented some of his views and ideas.

**Keywords:** MIDI music production; music teaching; Computer musical technology;

## 1 Introduction

Computer music courses have become an emerging hot spot of the domestic music colleges courses, and witch has been most accept by

musicians as an adjunct of the music teaching. However, it is has appeared in many music institutions as an independent professional courses, or are some of the institutions envisaged new teaching plan, but the course apparently still has a long way to go. We are facing the students that accept the traditional music education students with a few years or even more than a decade in higher music institutions. Traditional music teaching and training methods has been deeply rooted in their thinking, which is a certain degree of difficulty in order to integrate into the new teaching and training methods, especially at the initial stage, whole teaching is particularly difficult for them to realize learning music before mastering computer music means that be able to effectively promote teaching in contemporary. Therefore, as teachers of computer music courses it is necessary to adopt new teaching methods, while also using some of the new teaching methods, so that students can quickly experience to master the computer music means to the benefits of their learning, thus better able to learn computer music technology, more properly applied to computer music into their music learning, to promote the improvement of their musical ability.

Traditional music teaching mode is that the teacher plays piano and students sing, or the recorder put a few songs for students, music teaching equipment is not perfect, the music

teaching method is not scientific, the MIDI music production applied to teaching music to the music classroom will greatly enhance the scientific and fun, "MIDI is the English abbreviation of Musical Instrument to digital-Interface, is simply the musical instrument digital interface, MIDI music, not the sound signal output audio stream, control parameters but note, facial expressions and other instructions. MIDI music production closely and music teaching software and multimedia system in the visual image, the MIDI music production plays an important role in the teaching of music, MIDI music production software is actually composition, orchestration, playing electronic simulation system". As the music educators, we discuss music teaching in detail in MIDI music production application.

## **2 Introduction of MIDI music system**

The birth of electronic musical instruments caused a revolution for playing traditional instruments technology, performance capacity and the instrument concept. Japan first developed and launched a small electronic synthesizers, electronic musical instruments from the laboratory into the music studio, and quickly affects the life of our traditional music.

MIDI is a protocol designed to record and play music on a digital synthesizer. The digital synthesizer requires the use of many PC sound cards to support. MIDI originally intended to control a keyboard from another keyboard, but soon PC. It passes music how to generate the information, rather than directly transmitted musical sound. Podium, including the key from the key, the key rate, and pitch bend wheel and the other to control the synthesizer. The acoustic wave generated has already been saved in the memory of the receiving apparatus or sound. Because MIDI files are only on behalf of the player, it is more concise than the direct sound

format. One advantage is that the file is small. One drawback is the lack of detail sound control. You can use the keyboard or other input device to create music by MIDI program to provide such an interface and else can play your MIDI format works by use the same or other programs and a sound card as a music synthesizer. The MIDI program may be accompanied by a graphical user interface looks like a recording control room. Many sound card MIDI software (such as Media Vision's Pro Audio Studio 16) packet.

MIDI protocol uses 8-bit serial transmission, a start bit and one stop bit data rate is 31.25Kbs, and Asynchronous Transfer.

Therefore, more than one electronic musical instruments to communicate with each other has become possible, the introduction of the computer into a music production system is also about to become a reality, this form of computer music been more widely disseminated and development. The teaching mode system underlying principle is based on the MIDI protocol.

## **3 Effect of MIDI on the teaching of music**

### **3.1 MIDI enhanced music lessons fun**

MIDI music production software application can make music theory lessons for students to create a pleasant and relaxing atmosphere for learning, students in this environment greatly improved knowledge of music theory motivation to learn, to stimulate students 'interest in learning to improve students' music learning efficiency. Via MIDI music production software applications, a change in the traditional music teaching carried out only on the blackboard to explain the drawbacks of musical knowledge through demonstration of the software to explain the boring text notes into a beautiful, intuitive image improved, inspire students' enthusiasm for learning music.

Meanwhile, MIDI music production software can be coupled with a different melody accompaniment, such as piano, orchestra, percussion, etc., students can distinguish different instrument sounds to deepen the impression of different instruments, is conducive to the knowledge of music theory understand.

### **3.2 MIDI can improve the accuracy of sound**

Beats and vocal music classes on the accuracy requirements are relatively high; MIDI music production software just can satisfy this requirement. Audiovisual exercises as an important part of music teaching and learning is good or bad will affect the progress of students in music degree. MIDI music production software applications will overturn the traditional! Monotony of classroom teaching, it is not only the freedom to adjust the sound output size, accurate follow any tempo, but also provide students with a virtual music plug-in "teachers guide students through the basic playing method, you can allow students to conduct themselves with performances from the timely detection problem using this approach, greatly mobilized student participation in music learning, reduce the intensity of the teacher's work, while, MIDI music production software for professional and accuracy makes the students more accurate grasp of music, students can sample the audio via MIDI find yourself singing shortcomings, and enhance students 'musical sensibility to enrich students' concert experience, improve singing skills.

### **3.3 MIDI facilitate student understanding**

The traditional music of course is usually watching work while listening to audio, and then the teacher explained through the analysis of the work completed. Via MIDI music production in the music teaching, music teacher can explain the

need to focus on composing for pre-made, in the classroom can play step by step, and then synthesized play, so that students can feel a whole different melody produced by the different results. But also to students in the show can play any one need to explain the passage of sound, which is more conducive to ease the work of music teachers to explain the analysis to facilitate student learning and understanding of the work.

### **3.4 MIDI improve professional voice lessons in orchestration application**

Musical instruments and orchestration of music teaching is the teaching subject. Vocal music is a kind of singing and singing performances, and orchestration is generic terms on various musical instruments include strike, and other musical instruments, which is music creation of weapons. As a comprehensive expression of vocal music diversity and orchestration, teachers may not fully take into account in music teaching in music teaching, the application of MIDI music production is very necessary. On the one hand, MIDI can accurately record the students' performance, and can be repeated, so that students and teachers to find concert, very convenient. On the other hand, teachers can use MIDI to show different music performance form and tone, carries on the simulation using different instruments playing card, deepens the student to the musical memory, providing typical musical performances, guide students to observe, so as to improve the students' music quality.

## **4 MIDI music production influence future development of music creation**

Multimedia computers are in the information age that people must rely on equipment. Composer must change the traditional concept of the creation, expansion mode of thinking, the use of

high-tech means to plunge into the creation of the new century music in the past. In recent years, electronic equipment and information technology innovation and development become more and more "computerized", "information" and "networking", the future will be based on computer music system based on computer network to build up. As 21 century composers, online music must have mastered the skills of resource development and utilization of quality. Resources in the network is extremely fast and convenient way to get what you need music, text, images, audio and other music information, be able to look around the world of folk music, data files of famous musicians, classical music and foreign various periods, calendar of music publications and periodicals, live concerts, the latest scientific research and musical works, works of recent music competition or solicitation messages, etc., if not timely understanding and knowledge of these new technologies, it is undoubtedly the lack of competitiveness. Computer music technology to bring this revolutionary new way to contemporary music composers put forward higher requirements, musical works from the initial idea to the finished, all the various operations by the composer himself and the entire computer electronic equipment systems. In addition to the composer's music has extensive accumulation, superb music theory, composition techniques skilled, but also has a diverse musical creative thinking, mastery of advanced technology and strong multimedia computer hardware system's actual operating capacity.

#### **4.1 Lack of "humanity"**

Computer has "accuracy" beyond human beings, which is both its advantages, but also its disadvantage. The absolute accuracy of the kind of play that music loses realism, the lack of

humanity, the sound seemed cold and dull, dull and mechanical, machinery taste too thick, a direct impact on the music expression and affinity. Many people have such qualms: "Computer music is too mechanical, does not have the person's thoughts and feelings." However, some computer composers put this view as a misunderstanding of the computer, and even prejudices. They think that computer music whether they have feelings, lies in the people, not things. As a musician full of emotion and meaning of the classic is a beginner piano man playing beyond recognition, as the composer of its responsibility does not lie in what tools to use to create, nor the player using electronic or traditional acoustic instruments to play. The computer does all the work to comply with the instructions given by the feelings of the people, the only alternative to the composer in the hands of computer paper and pen. As a computer playing music, the composer of music requires imagination and knowledge of the MIDI technology, mastery of the keyboard playing techniques as well as the use of audio equipment to achieve the perfect combination of music produced in order to avoid a mechanical sense.

#### **4.2 MIDI impact on tablature**

Any kind of mature language has a corresponding symbol complete recording system. Music as a special language, our predecessors have left us with a classical music "classical notation." Classical notation can cover between music information including pitch, rhythm relationships, and the strength of relationship, expression requirements and acoustic features. Although this notation can also be adapted within a certain range of computer music notation needs, but has not fully reflect the unique electronic musical instruments and sound characteristics of the pronunciation. For a variety of different types of

waveforms compound, a variety of modulation characteristic tone exist, the use simple symbols indicating their precise acoustic features is difficult. Aspects of computer music notation has been varied, prevails. Some works give an idea of the virtuoso sketch or blueprint, which includes primarily playing the media and the control mode and other information, such as frequency, volume, tempo, playing instruments and playing style and other basic elements. Most often in the music synthesizer works by the creator or composer after the actual sound re-notation, music and even finishing completed by others. Remember that the score could meet certain traditional norms for music researchers to better understand the work, but most of the music for the general music people like hieroglyphics. Some computer music no music, there is only the technical details of its operation instructions, and some use a similar notation drawings are not necessarily reproduced in the sheet music notation. Scientific notation will further guide the birth of electronic musical instrument musician deepen understanding, and promote the creation of computer music.

### **4.3 Timbre problem**

Computer music with traditional instruments sound as a sample, using synthesis, simulation, sampling and other techniques to simulate the traditional band sounds, and even the "production", "synthetic" new sound, the band gained more than traditional rich sound. As computer music system features continuous development and improvement, computer music system sound almost unlimited scalability. Especially those colors extremely rich folk instruments simulation sounds, those designed to reflect the ethnic instrumental in the band's sound characteristics and folk music style computer music, but also plays an indispensable role. On the current technical capabilities, the narrow

sound simulation has not its problem. The sampling synthesizer, one can often hear some simulation ethnic instrument sounds. They are using high-fidelity digital recording technology directly entered the actual sound you are playing real instruments. Although sampling synthesizer emulation tone and timbre of these acoustic instruments is almost no difference, can reach almost as real degree, but the effect is not very satisfactory sounds carefully, especially three-stringed lute, lute, Banhu, Pipa, which are highly distinctive musical instruments, playing method is very complex and is very difficult to imitate. Playing methods include using different trigger modes to play the various different "tone" and some awareness of pitch slide, such as pull-outs and pizzicato, legato and staccato, the tone and overtones, natural sound and blocking sounds, portamento, etc. . In fact, when people appreciate ethnic acoustic instruments, playing techniques are used to hearing through subtle changes in tone change obtained. In the electronic musical instrument, the sound is a single tone simulation is based, that is, to a certain kind of playing techniques as a sound basis; it is difficult playing techniques by changing the way to get a variety of timbre changes. This single tone simulation and the audience clearly in mind the characteristics of sound is not the same. This has to a certain extent; limit the development of electronic musical instruments. But I believe with the technology forward, this problem will get better sound.

### **4.4 The future direction of music**

It can be predicted that the future music will continue to surprise us and make a new sound experience. Music producer must pass a variety of computer tools such as broadband multimedia distributed application technology, and MIDI audio, and many other creative services for the

music; also through a variety of means to complete a higher degree of difficulty of programming music, because ordinary musical instruments arising the sound is extremely limited, special programming through computer processing that can create traditional instruments can not be achieved. The future of music creators who are good enough for those who will become the computer, equipped with a digital portable notebook or more advanced equipment, can immediately appear as inspiration to create, not only for them to be able to create more elegant, beautiful music provides a convenient conditions, but also greatly improve the efficiency of creators. By that time in the composer's mind, score, orchestration, musical instruments law is no longer the only means of creation, and frequency response, balance, space, frequency filtering, envelope, reverb, delay, effects, mixer, etc. the term will also be a three-dimensional musical ideas and constitute one of the important factors. In addition, the networking technology throughout the world, which for the musicians were able to cooperate with each other co-authoring convenience. After the creation of the composer completed, you can be able to work into an interactive multi-path random access networks, making new music information resources.

## 5 Conclusions

In short, the appearances of MIDI music production software stimulate students' interest in music and deepen the students' understanding of music and to improve the students' music literacy. MIDI music production software in music teaching technological development is inevitable,

it conforms to the requirements of comprehensive development of quality education under the trend of music teaching. Traditional music teaching students violated the law of development of music cognition, rapid development in science and technology today, we as music education workers must reform music teaching model, taken with suitable advanced teaching methods, the MIDI music production software application to all aspects of teaching, teaching content makes intuitive, accurate and lively, so music teachers grasp MIDI music production software and music teaching will directly contribute to the reform of music teaching.

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