

# Application of Computer Network Multimedia Technology in Vocal Music Teaching Mode

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**Abstract.** Nowadays, with the continuous development of the times, multimedia technology(MT) is rapidly infiltrating people's lives, and people are paying more and more attention to multimedia teaching, which has been well applied in vocal music(VM) teaching. Since VM is a highly practical and relatively abstract subject, it is necessary to organically combine theory with practice. In addition, nowadays people have higher and higher requirements for music aesthetics, and the enrollment scale of VM majors is increasing, making traditional teaching methods no longer able to meet the needs of vocal talents. Because the network MT can well solve the problems in the traditional classroom and make up for the shortcomings, it has played an important role in improving classroom efficiency, improving the quality of teaching and teaching effects. At the same time, the use of modern methods for VM teaching can also provide teachers with more convenience. Therefore, under this background, it is necessary to combine modern education methods with VM teaching mode(VMTM) to realize the transformation of VMTM. This article uses questionnaire survey method and data analysis method to make use of the advantages of computer network MT to make VM teaching simpler and more intuitive, so as to achieve better VM teaching effects. According to the survey results, most interviewees believe that the application of computer network MT in the VMTM has certain effects and brings a lot of vitality to the development of the course.

**Keywords:** Vocal music teaching, Teaching mode, Multimedia technology, Applied research.

## 1 Introduction

With the continuous development of society and the continuous advancement of science and technology, people have had a great influence on the mode of music teaching. Because the VM teaching itself is relatively abstract and complex, coupled with the simplification of teaching methods and the limited subjective comprehension abilities of both teaching parties, there are still some problems in traditional VM education methods. In the context of the new era, the combination of information technology and traditional VM teaching has become the trend of current social development. The rapid popularization of new media such as MT and online music has been favored by the masses, and the number of users has increased. It has also had a subtle impact on students' acceptance, information literacy, and interest in learning.

At present, the research results on the application of computer and MT in VM teaching

are very abundant in the academic circles. For example, Liang Yuanyuan pointed out that the interactive mode of VM teaching based on network MT has achieved better practical results and improved classroom efficiency [1]. Yu Yanjie believes that the use of multimedia and network technology in VM teaching, combined with sound, video, animation and other elements, greatly enhances students' perception of abstract vocal theory knowledge and practice [2]. Han Linjiang proposed that the application of information technology to music teaching expands the depth and breadth of classroom teaching, and also increases the vividness and vividness of music classroom teaching [3]. Therefore, this article focuses on the application of computer network MT in the VMTM, and it has very important research significance and application value.

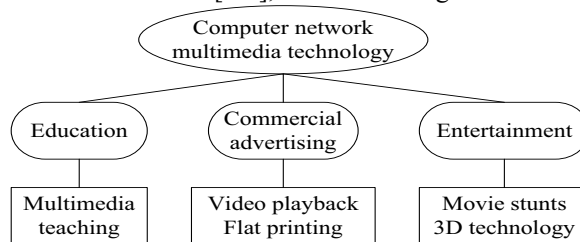
This article mainly discusses these aspects. First, it elaborates on the computer network MT. Then it discusses the VMTM and its current situation. In addition, the application of image noise reduction algorithm in multimedia VM teaching is also introduced. Finally, regarding the application of computer network MT in VMTM, a questionnaire survey and research were carried out, and the survey results and analysis conclusions were drawn.

## 2 Computer network multimedia technology and vocal music teaching mode

### 2.1 Computer network multimedia technology

Computer network MT, based on the computer network, combines the processing of sound and electrical information, multimedia images and other related content, and conducts comprehensive applications to integrate various rich and colorful resources into an organic whole, so that users can use multiple senses real-time information interaction with the computer.

With the rapid development of information technology, computer network MT has gradually been widely accepted by people and penetrated into all areas of life. At the same time, it is playing an increasingly important role in people's lives, and has gradually become one of the indispensable technical means for people's daily life and learning. Computer network MT has been applied in many fields, such as education, commercial advertising, and film and television entertainment [4-5], as shown in Figure 1.



**Fig. 1.** Application of Computer Network MT.

Due to the emergence of network MT, the teaching mode has been changed, and students can use mobile phones, tablet computers and other devices for vocal training in the classroom. At the same time, it also provides teachers with a more convenient and comprehensive communication platform. In VM learning, students need to collect, organize and store a large amount of sound information. These audio data are processed through a computer, etc. and transmitted to the relevant system. In the classroom, multimedia equipment is used to conduct VM teaching through the combination of sound and picture or dynamic display [6-7].

## 2.2 Vocal music teaching

As the characteristics of each discipline are different, correspondingly, educational theories and educational laws are also different. VM also has the common characteristics of education, but its unique musical style is very obvious. While VM teaching is one of the teaching activities, it is also a practice activity of spiritual civilization education.

VM teaching also has these characteristics. The first is the social nature of practical activities. VM uses vocal singing as a means of expression to express music content, express the thoughts and feelings of lyrics and songwriters, express the singer's singing emotions, and reflect the current social situation at that time. Because of the combination of its rich melody and colorful lyrics, it is easier to be understood and accepted by people, and it can further form its wide-ranging social characteristics. The second is uniqueness. According to the different conditions and qualities of VM teaching objects, VM teachers adopt different training methods and training methods, and analyze specific problems in order to achieve corresponding teaching effects. The third is roundness. The teaching process of VM is very abstract and subjective. It requires the learners themselves to constantly, repetitively practice and consolidate until they master and develop the correct vocal habit. The fourth is cooperation. The mutual assistance, cooperation and communication between the two parties in VM teaching is an important way to achieve the best results in VM teaching. The importance of mutual assistance and communication between the two parties in VM teaching activities is far higher than that of other subjects. If one of them has a tendency to not cooperate, it is very difficult to achieve better teaching results [8-9].

In the teaching mode, the traditional VM class adopts the "word of mouth" teaching method, mainly through the description of teacher's speech or vocal demonstration, and students through their own understanding, continuous imitation and practice, and finally achieve the required vocal training state. This teaching mode is limited by the teacher's interpretation and self-expression ability and the student's comprehension ability, and the teaching method is abstract. If students cannot fully understand and adjust their own state correctly, it will easily affect the quality and effect of singing lessons.

Due to the particularity of VM teaching, the standard of the students' voice needs to be given feedback guidance in the first time. In the traditional VMTM, teachers and students train and guide vocal skills and vocal works in a fixed time period and space. Teachers can also make timely assessments of their own teaching effects based on students' on-site responses, follow up feedback information, and improve their own teaching methods.

Judging from the scale of education, in recent years, the number of art enrollment in colleges and universities has increased rapidly, and the quality of students seems to be uneven and uneven. As a result, some colleges and universities have transformed the traditional private VM lessons and traditional teaching methods, from traditional private lessons to group lessons and other teaching methods. Despite this adjustment, the number of teachers is still relatively small, so the per capita teaching time of VM classes is correspondingly reduced, the efficiency of face-to-face teaching also decreases, and the overall quality of VM classes is also declining [10-11].

The current situation of VM teaching is becoming more and more severe, and the problems of shorter per capita classroom learning time and relative decline in the quality of VM teaching have become increasingly prominent. VMTM will be restricted by time, scale, teaching method, teacher-student communication and other aspects, which causes the problem of general decline in teaching quality. Therefore, continuous improvement of VMTM and further improvement of the quality of VM teaching has become a very urgent issue.

### 2.3 Application of image noise reduction algorithm in multimedia vocal music teaching

The rapid development of network technology has led to the rapid growth of multimedia data on the Internet. Image has become the most basic and most extensive form in the process of visual information transmission. Compared with data types such as text and sound, digital images have higher characterization capabilities, and can store a large amount of color, structure, and texture information in a small amount of data. Among them, image noise reduction is a technical means to improve the quality of digital images, which is widely used in many aspects of computer technology applications, such as multimedia VM teaching. A good noise reduction algorithm can effectively improve the image quality. The image after noise reduction is smoother and the gray value changes more gently, making the teaching display screen clearer, thereby improving the quality of VM teaching and providing reliable technical guarantee for subsequent processing and analysis [12-13]. The image observation model is expressed as a formula.

$$W(u) = I(u) + M(u), u \in \Pi \quad (1)$$

Then, the variance of the image noise is.

$$\text{Var}\left(\frac{2}{|M_u|} \sum_{g \in M_u} M(g)\right) = \frac{2}{|M_u|^4} \sum_{g \in M_u} \text{Var}(M(g)) \quad (2)$$

The estimated value of pixel  $u$  is the weighted average of other pixels in the image, which can be expressed as.

$$MK(\hat{I}(\hat{u})) = \sum_{g \in 2} s(u, g) W(g) \quad (3)$$

Among them,  $M$  is an image contaminated by noise,  $I$  is a pure image,  $M$  is an independent and identically distributed Gaussian random variable,  $u$  and  $g$  are given pixels,  $s(u, g)$  is the weight, and  $M_u$  is the value of  $u$  The center of the field.

## 3 Questionnaire survey on the application of computer network multimedia technology to vocal music teaching mode

### 3.1 Questionnaire design process

The questionnaire survey selected 90 citizens of City F, including music majors, teachers and vocal lovers. Through the issuance of online questionnaires or paper questionnaires, the collection and quantitative analysis of the information filled in by users are carried out to draw conclusions of the questionnaire.

(1) In the preliminary preparation of the questionnaire, the number of questions should be as concise as possible to avoid fatigue of the interviewees.

(2) The questionnaire is released. Questionnaires were distributed through online questionnaires, on-site questionnaires, and inviting friends to help ask friends and students around them to fill in the questionnaires. A total of 90 questionnaires were distributed and 90 valid questionnaires were returned. The questionnaire recovery rate was 100%.

(3) Questionnaire analysis. Organize the collected questionnaire information to get the required information data. Analyze the results of the questionnaire. The analysis results include citizens' opinions on the application of computer network MT to VMTM. Some of the results obtained from the questionnaire are as follows.

### 3.2 Questionnaire survey content

The first part is the selected 90 citizens of City F, including music majors, teachers and vocal enthusiasts, to investigate the effect of computer network MT in the vocal teaching mode.

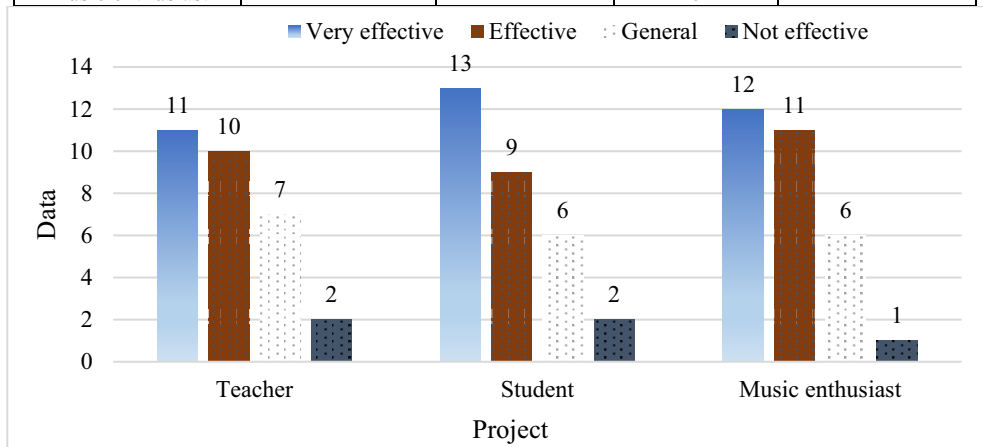
The second part is to sort out the information collected in the questionnaire and understand the opinions of 90 citizens on the application effect of computer network MT in VMTM. Part of the questionnaire survey results are as follows.

## 4 Questionnaire survey and analysis on the application of computer network multimedia technology to the teaching mode of vocal music

In this questionnaire, the interviewees included music majors, teachers, and VM enthusiasts, and conducted a questionnaire survey on the effect of computer network MT in VMTM. The survey results are shown in Table 1.

**Table 1.** Effect of computer network multimedia technology applied in VMTM.

Project	Very effective	Effective	General	Not effective
Teacher	11	10	7	2
Student	13	9	6	2
Music enthusiast	12	11	6	1



**Fig.2.** Effect of computer network multimedia technology applied in VMTM.

It can be seen from Figure 2 that with regard to the application of computer network MT in VMTM, 66 of the interviewees thought it was effective, while only 5 thought it was ineffective. Among them, a total of 22 students majoring in VM said that the application of the technology is effective. It can be seen that most of the interviewees believe that the application of computer network MT in the VMTM has a certain effect and brings a lot of vitality to the development of the course.

## 5 Conclusion

With the development and progress of the times and the continuous improvement of social demand, MT has gradually been widely used in the field of education, and has achieved good results. At the same time, MT also plays an important role in the spread of VM.

Computer network MT organically combines modern information technology and VMTM. In VM teaching, computers and other media devices are used for information processing and analysis, and then transmitted to students, providing students with more alternative learning platforms. At present, many colleges and universities have introduced computer multimedia teaching equipment to assist the development of school VM courses, provide an online communication platform for teachers and students, and help teachers improve teaching efficiency. Therefore, this article discusses computer network MT and VMTM, analyzes the application of this technology in VM teaching, so as to promote the innovation and improvement of teaching mode, and improve the quality of VM teaching and the efficiency of talent training.

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