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Reform and Innovation of College Music Teaching under Background of Multimedia and Network Technology

Jiahua Li[1, 2*]

[1]*Shanxi Datong University, Shanxi, China*

[2]*Philippine Christian University, Philippine*

02020003@sxdtdx.edu.cn

[*]*corresponding author*

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Abstract: With the rapid development of information technology, China's higher education system is facing significant challenges. Modern multimedia technology is gradually being applied to various fields of study at universities. As a result, vigorously developing modern educational information technology is an unavoidable choice for the historical development of higher education. The Internet and multimedia technology's effects on music education reform in colleges and universities are examined in this essay. The study outlined the challenges faced by Chinese music education and suggests appropriate solutions through research on the viability of multimedia and network technology. In terms of classroom efficiency, student satisfaction, and teaching comprehensive score, the multimedia teaching mode were compared to the traditional mode. The results showed that the model's teaching efficiency in a multimedia environment improved by 0.63, the proportion of satisfaction increased by 25%, and the comprehensive score was 8.1 points higher than the traditional model. This also demonstrated that music education reform in colleges and universities was feasible in the context of multimedia and network technology.

1. Introduction

With the advent of the information age, computer network technology, with multimedia technology at its core, has advanced significantly, and people have entered the information society. Since the 1980s, China's educational system has advanced quickly, thanks to the continuous development of computer multimedia technology and Internet technology.

Multimedia and network technology is a significant breakthrough in college and university teaching reform. In recent years, the use of multimedia and network technology in college and university teaching has demonstrated that the use of multimedia and network technology can promote the reform of teaching structure and methods. This article has some relevance to the advancement of multimedia network teaching theory. This not only has good practical and practical implications, but it also serves as a useful reference for further deepening university curriculum reform and improving teaching quality.

2. Related Work

With the rapid development of multimedia and network technology, this technology has become more widely used in college music teaching, having a significant impact on traditional teaching. Over time, academics have also looked into music instruction in colleges and institutions. Wang Xiaoshu recommended the study on the integration of music instruction and ideological and political courses in order to highlight the contribution of music instruction to the teaching of these subjects. It could reduce the effect of inaccurate data on political and ideological activities in colleges and universities. He developed the deep learning methodology. Additionally, he improved the method of integrating the ideological and political work with the instruction of college music and realized the research on the subject [1]. Text, image, sound, animation, video, and other technologies are combined in multimedia technology to create a logical relationship that reveals more nuanced and intricate concepts and patterns. Through the application of multimedia technology, Fang PENG has improved the way that music is taught in colleges and universities. College students can experience spiritual fulfillment, enhance their feelings for music and art, and gain a lasting grasp of life and the future through music appreciation [2]. Music teaching is an important means to cultivate students' music quality. Lian ZHOU believed that music teaching can promote students' music learning and cultivate their ability to understand, express and create music. It can also guide students to experience emotion, cultivate aesthetic ability, integrate their emotion into performance, constantly improve their artistic accomplishment, and achieve a perfect interpretation of the musical connotation of instrumental music works [3]. In order to study the motivation and influence of high school music students who are interested in music teaching and those who are not, Rickels David A analyzed the population of colleges and universities, including musicians who expressed their willingness to engage in music teaching or other music professions, and musicians who expressed their willingness to engage in other non-music professions. Through the data reduction strategy of principal component discriminant analysis, he found that the model can correctly classify 70% of cases, career choices seem to be multi-dimensional, and discrete sources of influence may not independently predict the overall choice of pursuing music teaching [4]. Scholars have studied the role, optimization and combination of music teaching, but they have not explained the teaching reform. In this regard, the relevant scholars discussed the teaching reform in colleges and universities.

Teaching music is a crucial component of high-quality education and it helps develop talented, creative people in the twenty-first century. Liu Yang created a multimedia teaching platform based on multimedia for indoor instrument instruction in order to improve instrument instruction. He then put the devised teaching platform to the test to confirm its efficacy. The proposed teaching platform can encourage students to master knowledge, which is conducive to the realization of indoor music instruction, according to the analysis of platform performance [5]. Teaching strategies and content can change quickly in response to intense external pressure, such as that brought on by financial incentives, inspections, school selection, and public displays of schools' and students' success. In this regard, Ferm Almqvist Cecilia explored how much change was needed to demonstrate via

music education in the framework of compulsory education and came to the conclusion that evaluation and scoring duties were taking over instructional activities more and more [6]. Schools need to have a clear understanding of music pedagogy in order to meet the needs of higher education. Rumiantsev Tamara W suggested that the focus of curriculum updating when reforming music education was to implement a wider range of skills, knowledge, and attitude teaching, including problem-solving, reflection, cooperation, and communication skills, which can also be implemented in conjunction with traditional teaching methods [7]. The degree and requirements of reforming music education have been explored by academics, but no research has been done against the backdrop of multimedia and network technologies. This background is addressed in this essay as it relates to the reform and innovation of music education in colleges and universities.

This essay examines existing traditional teaching methods with the viability of changing how music is taught in colleges and institutions. The findings demonstrate that music instruction can be improved against a backdrop of multimedia and network technology, which is advantageous for the growth of institutions and satisfies modern demands.

3. Reform and Innovation of Music Teaching in Context of Times

3.1. Definition of Multimedia and Network Technology

Due to the quick advancement of computer technology, people appreciate multimedia and network technologies more and more in colleges and universities, where they are also used as effective reform instruments [8]. Traditional education takes up more resources in the classroom. In contrast to multimedia education, this method not only saves time on blackboard writing, but also has rich content and flexible form, without time and space limitations. It is convenient for students to review and search in the classroom. Figure 1 displays the benefits of teaching with multimedia.

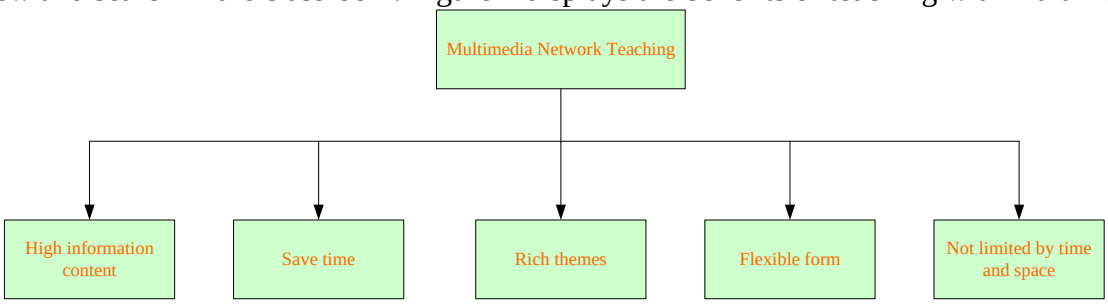


Figure 1. Advantages of multimedia teaching

Multimedia is to express and disseminate information through digital, sound, text, pictures, videos and other carriers [9-10]. This is the end product of information technology development. Multimedia technology integrates voice, image, video, animation and other technologies, forming a new computer technology that is different from the traditional one. The system can fully mobilize people's ears and eyes, interact with the computer through various senses such as dictation, seeing with one's own eyes, and touching, and artificially select and control the reception of information, so that people can fully communicate with machines and obtain information simply and conveniently. By processing data, multimedia technology digitally compresses and processes various information media, so that a large amount of audio and video information can be stored and transmitted. The development direction of multimedia technology is mainly to integrate the computer with TV, audio, telephone and other electrical appliances through the multimedia of the computer itself, so as to make audio and video technology intelligent [11-12].

3.2. Advantages and Feasibility of Multimedia and Network Technology Teaching

Multimedia Internet education is to select and use modern teaching means through appropriate methods in the course of classroom teaching according to the common characteristics of the course objectives and education goals. Through modern computer technology, it can implement the most efficient education for learners, and then establish a scientific education process to achieve the best teaching environment [13]. The five functions of multimedia computer and network technology teaching are shown in Figure 2.

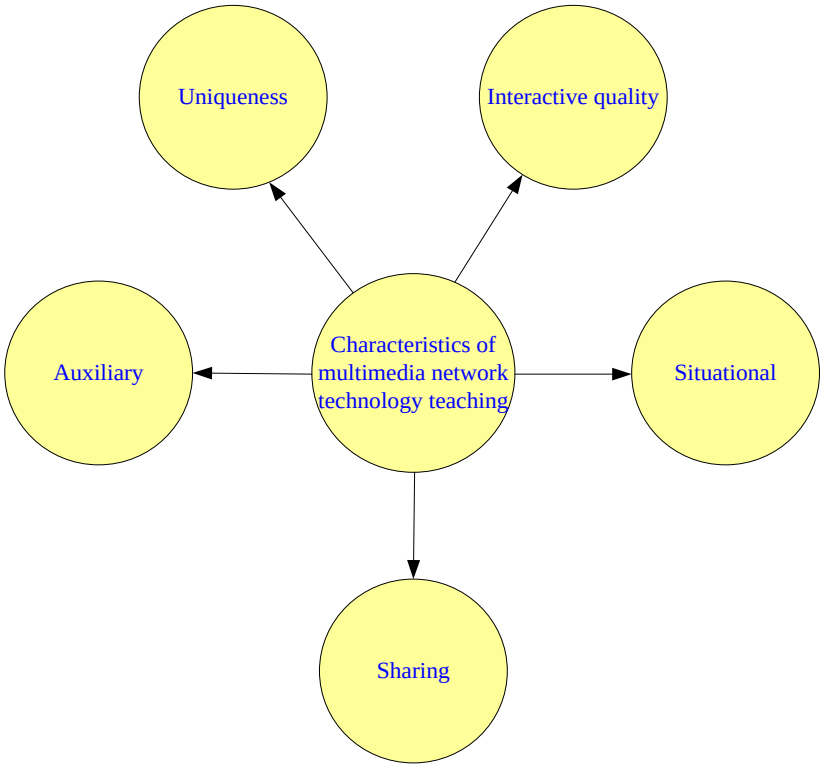


Figure 2. Characteristics of multimedia network technology teaching

The first is dialog-based. The interaction between humans and computers can be done with the aid of a multimedia network. Teachers and students communicate with each other extremely effectively. The second is situational. Situations can have a great impact on students' learning efficiency, which is an important reason for affecting learning. The third is sharing. The multimedia network environment is essentially an information resource network. When facing it, students can find their favorite subject knowledge, so as to achieve the purpose of learning and appreciation. The fourth is auxiliary. Some experiments cannot be carried out in the classroom, some are invisible to the naked eye, or take a long time. The fifth stands out. An optimal online database can target each student's learning environment thanks to the ongoing advancements in information technology. Through the identification of each student's learning situation, the corresponding teaching content is automatically generated, and the teaching schedule is reasonably arranged [14-15]. The fundamental infrastructure of colleges and universities serves as an advantageous starting point for the employment of network and multimedia technology. Information technology, represented by computer and communication technology, has advanced quickly and is now in a new era. Additionally, information technology has some influence on college education. The government has invested heavily in multimedia and the Internet. Both developed and developing countries have

given strong support to China's multimedia network technology education.

Multimedia and network technology have had a significant impact on traditional teaching methods, and has also produced a new teaching method based on multimedia technology and network technology. The application of multimedia technology and network technology in the classroom would promote people's re cognition and understanding of classroom teaching content, thus providing scientific and technological guarantee for further promoting the practice of teaching concepts and curriculum concepts. Additionally, network technology and multimedia technology are beneficial elements in creating a positive learning environment. Using multimedia technology in the classroom can significantly boost student engagement and the rapport between teachers and students. It is a novel and vivid teaching method. Multimedia teaching uses multimedia elements such as words, sounds, charts and animations to transform simple knowledge memory into intuitive impression memory. The manifestation of multimedia teaching is shown in Figure 3. The integration of vision, hearing and touch is realized by using multimedia and Internet technologies. In teaching activities, learners can see, hear, and through the use of teaching rules, they can integrate abstract logic with specific graphic knowledge to produce more dimensional and comprehensive thinking, thus breaking the barriers and constraints of abstract logic, making classroom teaching more in line with people's thinking mode, and thus obtaining good teaching and learning effects [16].

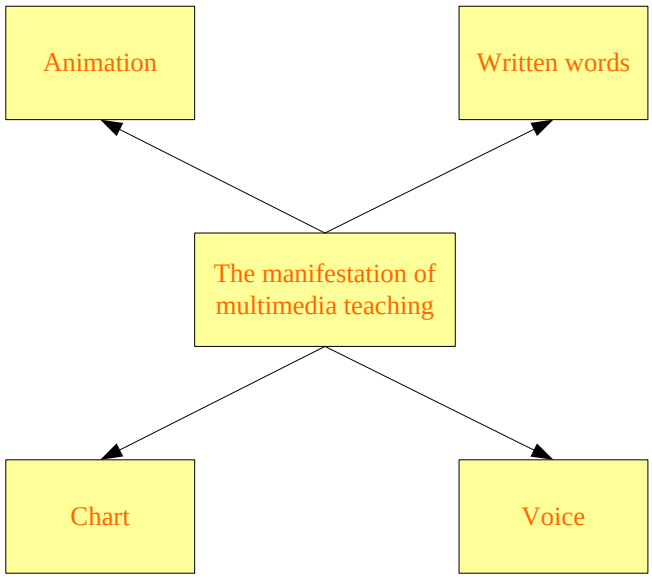


Figure 3. The manifestation of multimedia teaching

Schools can set up a distributed multimedia network teaching system. Teachers and students can use the system to gain access to distributed databases on the Internet for information retrieval, teaching, and learning purposes. The improvement of students' autonomy has been largely attributed to the usage of multimedia technologies in online instruction. Because students need to have certain network knowledge and collect required information, it is inevitable that traditional knowledge teaching would change to intelligent teaching. According to the characteristics of students, from a macro perspective, teachers are able to quickly assess pupils' actual learning circumstances, understand their ideological activities, adjust their teaching process, and use the two-way communication function of multimedia and the Internet to achieve dialogue and experience guidance between teachers and students. It can provide guidance and teaching according to the special situation of students. Multimedia and network technology can be used for music teaching, which can reduce students' class time, relieve students' learning pressure, and ensure

scientific and systematic professional settings.

3.3. Problems in College Music Teaching under the New Media Environment

Universities and colleges do not fully understand modern media. The emergence of new media is a trend, not an accident. Colleges and universities need a comprehensive understanding of the new era to support its development. However, in view of the current situation of music education in colleges and universities, it is clear that Chinese colleges and universities have not fully understood new media, especially in these fields. First of all, colleges and universities only loosely link new media with education, which makes new media education lose its importance from the very beginning. Second, many educators, especially senior educators, believe that modern technology cannot greatly help students' music teaching. They do not make full use of modern media in daily teaching, and they are unwilling to make use of modern media. Most of them use traditional techniques, which would obviously have a negative impact on music teaching in universities. Third, some students are lax in their thinking and action, unwilling to absorb new things, and just stick to their own thinking, unwilling to explore the world of new media and music [17].

Music education receives little attention at colleges and universities. Chinese colleges and universities' handling of their curricula has significant flaws, which is mainly because many teachers do not put music courses in an important position, resulting in fewer courses for music education. Under this teaching mode, many students have not gained much in music class, and their music level has not been improved. In addition, most universities in China are not strict with music courses. Therefore, it must increase our focus on music education if people want to effectively advance the development of music education at colleges and universities in the age of new media.

Colleges and universities have outdated teaching methods [18]. China's college music education should adapt to the needs of the times and advance significantly with the adoption of a new wave of curriculum reform and the growth of new media. Currently, professors still make up the majority of the music faculty in China's colleges and institutions. College and university education still has a lot of issues, such as students' inadequate knowledge of modern media. As a result, the reform of music education would be significantly impacted by the new media period.

The teaching staff is weak and the reform funds are short. Teachers in the new media era should be aware of the key role of new media, adapt to its evolution, and integrate it with new media. However, in practical work, in traditional colleges and universities, some music educators are still in the growth stage. They do not know enough about new media and are not optimistic about the education methods of new media, which has caused the disconnection between music education in Chinese universities and the times. The reform of music education in the new media era must have sufficient funds. However, neither the education sector nor colleges and universities have received adequate financial assistance. Figure 4 illustrates the problems of college music teaching in the context of new media.

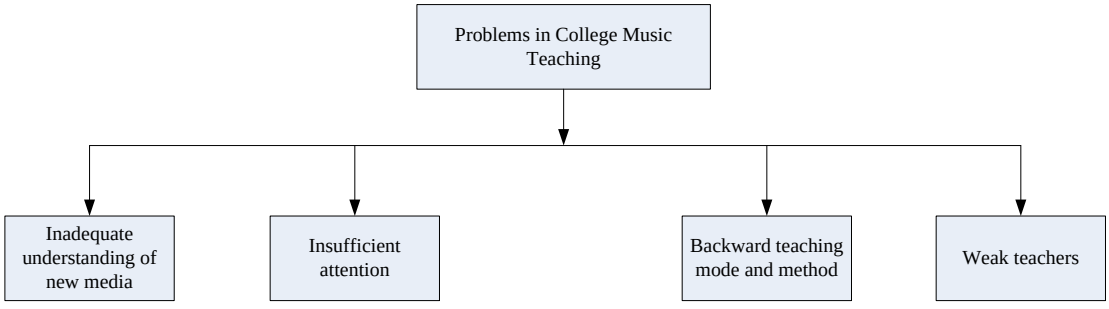


Figure 4. Problems in college music teaching under the new media environment

3.4. Reform and Innovation Strategies of Multimedia and Network Technology in Music Teaching

School teachers should take positive measures to change the traditional concept of music teaching. School teachers should actively reform the outdated traditional music teaching concept and integrate it with cutting-edge educational technology in the new media era, so as to realize the modernization of school music education [19-20]. First of all, in order to change the traditional music classroom teaching mode and cultivate students' strong interest in music, college music professors should actively accept the new media thinking and provide information for teaching. Second, in order to help new media education play its guiding role more effectively in the new media era, network technology and new media technology should be organically combined. Third, one should make full use of modern media to carry out music education, constantly improve and develop college music courses, and understand the most pressing difficulties in today's teaching. Fourth, one must actively create a new type of teacher-student interaction in the new media era. Personality, interests and hobbies vary from student to student. Therefore, music teachers in colleges and universities should pay attention to the dignity and personality of students. Through the use of multimedia and offline dialogue, online communication can greatly stimulate the resonance of college students' aesthetic feelings, thus improving the quality of school music teaching.

Universities should spend more money on music instruction. The new media music course has a very extensive teaching curriculum, and the specifications for various high-tech instruments are constantly increasing. Therefore, the relevant colleges and universities should strengthen music education and increase music teaching funds, otherwise it would be difficult to carry out the new media music course, let alone cultivate outstanding musicians. Therefore, in the new media music teaching, it should attach importance to and use various new methods.

First of all, university administrators should establish correct concepts, clarify the important role of new media in music education, and integrate it into the development plan of the school. In addition, it is also important to create a favorable environment for music learning through WeChat and improve the understanding of new media music teaching. Secondly, one should continue to increase funding for new media music education and actively introduce various new media teaching equipment to better provide music teachers with new educational resources.

The media literacy of college music teachers needs to be improved. As the organizer and designer of music education in the new media era, music teachers play an important role in the reform of music education in the new media era, and their own quality would determine the quality of new media education to some extent. Therefore, one should strengthen and improve the media literacy of music teachers. At present, in order to better carry out new media education, one can improve the application ability of new media. For example, college music teachers should actively learn and use new media technology to serve college music education. People can actively organize music teachers to carry out professional skills training and improve the application ability of new media by holding lectures, conferences, symposiums and other forms.

People should continue to optimize the development of music education in colleges and universities [21]. At present, China's music education is facing unprecedented challenges. The traditional music teaching can not raise students' interest, but simply follow the example, and students' enthusiasm is relatively low. As a result, it must use new media technology to alter the traditional teaching model in order to stimulate students' interest in learning. On the basis of music instruction, teachers should actively communicate and interact with students, turn the music classroom into a happy party, and let students understand the fun of music teaching. Students can unconsciously like music. At the same time, teachers need to have enough music skills to satisfy

students' curiosity about multimedia music teaching. The reform and innovation strategy of multimedia and network technology in music teaching are shown in Figure 5.

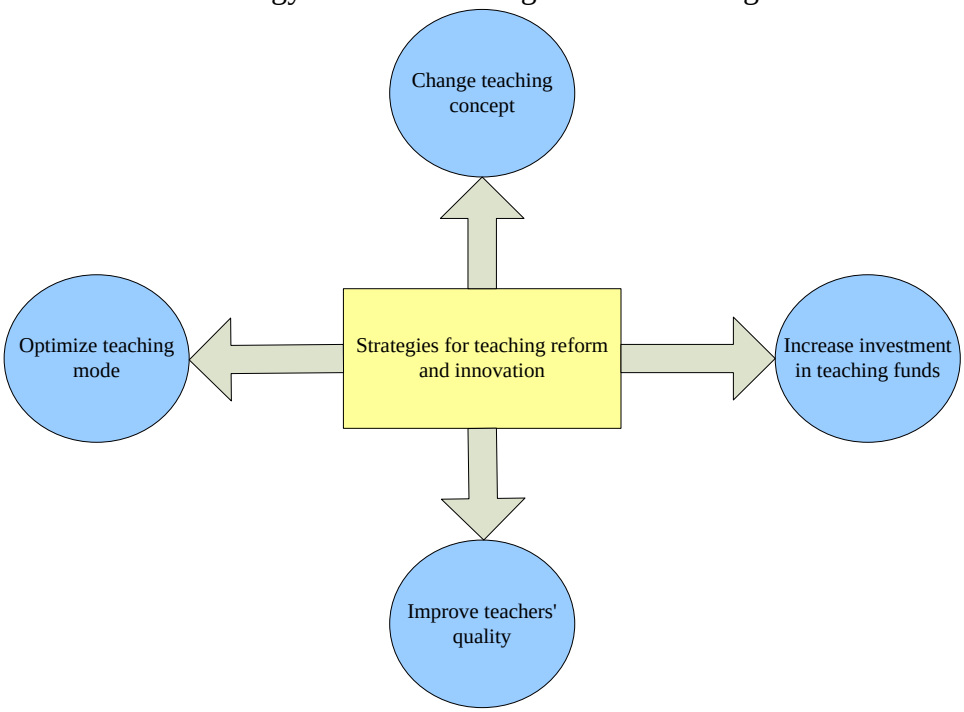


Figure 5. Teaching reform and innovation strategy

3.5. Quantitative Evaluation Method

When evaluating the quality of classroom teaching, teachers' evaluation of students is ambiguous, and teachers' evaluation of students often has different effects. As for the role of teachers in music teaching, people used to study it subjectively and unilaterally, which was not comprehensive and accurate enough. It is inappropriate to use the traditional accurate scoring method for such an object without a clear extension. However, it is frequently required to assess the effectiveness of classroom instruction by teachers using the fuzzy comprehensive method. The quantitative evaluation approach of the fuzzy comprehensive evaluation system is used in this work.

Through the collection of objects, factors and comments, they are integrated into a set, which is respectively object set D, factor set S and comment set Y. Then S and Y are analyzed by fuzzy analysis. The mathematical expressions of its three sets are:

$$D = \{D_1, D_2, \ldots D_x\} \quad (1)$$

$$S = \{S_1, S_2, \ldots S_m\} \quad (2)$$

$$Y = \{Y_1, Y_2, \ldots Y_z\} \quad (3)$$

In the formulas, x, m and z are the number of object sets, factor sets and comment sets respectively. Because many factors are involved in the practical application problems, and there are certain levels among the elements, the method of "multi-level comprehensive evaluation" is generally adopted for illustration. In this case, the given Q set must be divided into n parts. The result of segmentation conforms to the following formulas:

$$Q = Q_1 \cup Q_2 \cup \ldots Q_n \quad (4)$$

$$Q_i \cap Q_j = \emptyset (i \neq j) \quad (5)$$

There is

$$Q_i = \{Q_{i1}, Q_{i2}, \ldots Q_{ip_j}\} \tag{6}$$

Q_i is a composite indicator. There are p_j evaluation indicators in each indicator. The number of total factor sets is the sum of all evaluation indicators, which is also the second level indicator.

In each sub factor set, the factor weight distribution matrix B_i, i=1,2,... n can be established. In each element of the "evaluation target", the position and function of each element are different, that is, the proportion of each element in the comprehensive evaluation is different, and this proportion is called "priority value", that is, "weight value". There are many ways to determine the weight value, such as "relative importance correlation grading calculation". The weight has a significant impact on the final evaluation effect.

In the sub factors, the evaluation index is evaluated at a single level, and the evaluation is conducted at a single level through the comments on the sub factor set. The evaluation matrix T_i can be expressed as:

$$T_i = \begin{bmatrix} T_{i1} \\ T_{i2} \\ \vdots \\ T_{iv_j} \end{bmatrix} \tag{7}$$

Each element in the subset represents the score of each factor evaluation object. The comprehensive evaluation of the self set can be calculated through its comprehensive evaluation matrix. The mathematical expression can be:

$$W_i = T_i \circ B_i \tag{8}$$

In practical application, the "weighted average" comprehensive evaluation algorithm is the most effective method. It balances the size of the "weight value" among all evaluation factors and is suitable for the indicators that need to be comprehensive. Through the comprehensive evaluation of each subset factor, a comprehensive evaluation matrix W is obtained, which is:

$$W = \begin{bmatrix} W_1 \\ W_2 \\ \vdots \\ W_n \end{bmatrix} \tag{9}$$

According to the principle of comprehensive evaluation, the evaluation of n evaluation objects can be obtained. It can be expressed as:

$$F = W \circ B \tag{10}$$

Through quantitative evaluation, it can better obtain the comprehensive situation in music teaching. Finally, through the comprehensive evaluation, it can see its changes more intuitively, so as to observe the reform and innovation in teaching.

4. Comparison of Music Teaching in Context of Multimedia and Network Technology

This paper mainly adopts the method of questionnaire to compare the music teaching situation of two different universities. The conventional teaching method is one of the ways that the two universities teach music (This is referred to as the traditional model). One is the teaching mode under multimedia and network technology (hereinafter referred to as multimedia mode). By conducting three questionnaires on 100 students in each of the two schools, the data obtained retain their average value, which is also persuasive. This paper mainly compares the teaching efficiency,

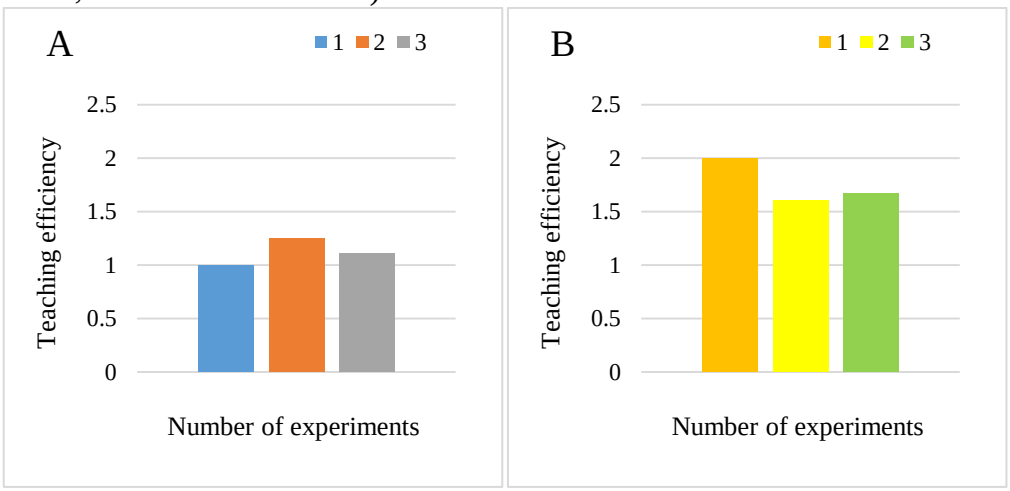
student satisfaction and teaching comprehensive score, and obtains each score through quantitative evaluation.

Teaching efficiency can be judged by the time teachers spend on fixed teaching content. According to 40 minutes of class time, the efficiency of just finishing a lesson is 1, and efficiency=one class time/time spent. The efficiency under two different modes is shown in Table 1.

Table 1. Efficiency under two teaching modes

Frequency	Traditional mode/min	Multimedia mode/min	Traditional mode efficiency	Multimedia mode efficiency
1	40	20	1	2
2	32	25	1.25	1.6
3	36	24	1.11	1.67

The efficiency comparison between the two teaching modes is shown in Figure 6. (6A: traditional mode, 6B: multimedia mode)

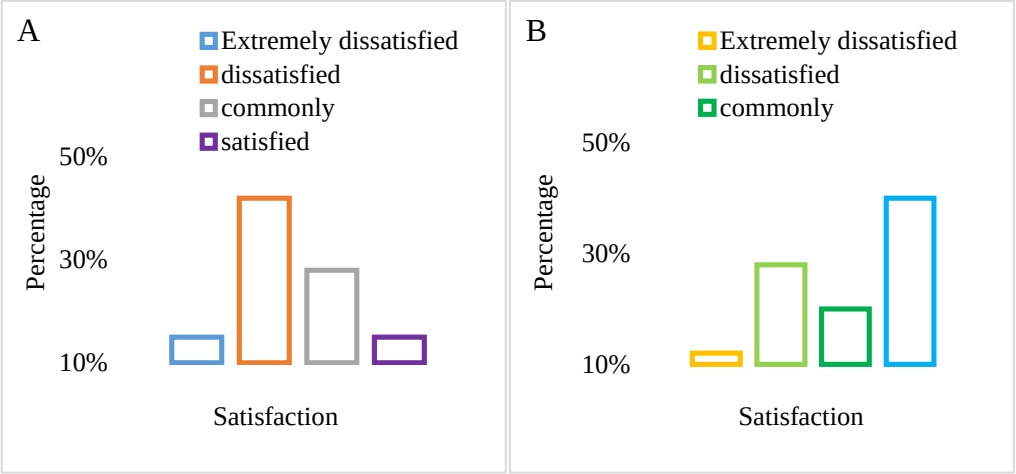


6A: Teaching efficiency of traditional mode *6B: Teaching efficiency of multimedia mode*

Figure 6. Comparison of teaching efficiency between the two modes

It can be seen from the traditional model of 6A that the teaching efficiency of the three experiments is respectively 1, 1.25 and 1.11, and the average efficiency is 1.12. In the 6B multimedia teaching mode, the teaching efficiency of the three experiments is 2,1.6 and 1.67 respectively, and the average efficiency is 1.75. It is found by comparison. Compared with the traditional teaching mode, multimedia teaching has improved the teaching efficiency by 0.63. Additionally, it demonstrates that music instruction would be more effective when conducted through media, which can save teachers' blackboard writing time and greatly improve the teaching efficiency.

Under these two modes, the student satisfaction is also different. According to college students' satisfaction with the two teaching modes, colleges and universities can make better modifications as a result of our improved understanding of the teaching reform scenario. The comparison of satisfaction scores under the two modes is shown in Figure 7. (7A: traditional mode 7B: multimedia mode)



7A: Student satisfaction in traditional mode 7B: Student satisfaction in multimedia mode

Figure 7. Comparison of student satisfaction

It can be seen from the traditional model in Figure 7A that students are quite dissatisfied, dissatisfied, and generally satisfied with 15%, 42%, 28%, and 15% respectively. In Figure 7B, their proportions are 12%, 28%, 20% and 40% respectively. The proportion of students who are satisfied with the multimedia model has grown by 25% when compared to the old approach, and the proportion of students' dissatisfaction has decreased by 14%. It also shows that compared with the traditional mode, students are more willing to accept teaching in the multimedia mode.

The teaching quality, professional knowledge and teaching attitude are the main points to be considered when evaluating the comprehensive teaching of teachers. The comment set is the information obtained from the questionnaire. The weight values can be calculated as 0.5, 0.3 and 0.2 respectively. The comprehensive score can be obtained through the student comment set of these three points. The comprehensive scores under the two modes are shown in Table 2.

Table 2. Comprehensive score under two modes

Serial no	Project	Traditional mode	Multimedia mode
1	Teaching quality	68	82
2	Professional knowledge	70	75
3	Teaching attitude	72	70
4	Comprehensive score	69.4	77.5

It can be seen from the data in Table 2 that the comprehensive score is 69.4 in the traditional mode and 77.5 in the multimedia mode. The comprehensive score in the multimedia mode is 8.1 points higher than the comprehensive score in the traditional format, demonstrating the viability of reforming the multimedia mode currently utilized in music instruction, and it is more conducive to the teaching of the university, improving the teaching efficiency and teaching quality.

5. Conclusion

As it enter the era of science and technology, multimedia and network technology have also begun to be implemented in college education, but the effect of its implementation is still unclear. This is a teaching reform, which has a far-reaching impact on college education. In this study, the

effectiveness of teaching, student satisfaction, and overall teaching score of the traditional and multimedia and network teaching modes are compared. The results show that the teaching mode based on multimedia and network technology has higher student satisfaction, better teaching efficiency, and higher comprehensive score. Multimedia teaching is feasible. The inadequacy of the article is that it did not explain the unfavorable factors under multimedia and network technology, and did not explain the comments on the detailed questionnaire. Because of the limited time, it did not fully explore the influencing factors of music teaching reform under multimedia and network technology. In terms of teaching reform and innovation in colleges and universities, it can also be judged by better methods. With the development of science and technology, colleges and universities would gradually develop in the direction of science and technology in teaching, gradually replacing traditional teaching methods. At the same time, it is necessary to change the teaching concept and make the teaching skills gradually adapt to the teaching methods in the new era.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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