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Multimedia Technology Supporting Innovation in Junior High School Music Education

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Abstract: Middle school music education is facing problems such as single teaching content, insufficient student participation, and lack of innovation, and urgently needs to find effective solutions to improve the quality of education. This article aims to study the innovative application of multimedia technology in junior high school music education and explore its promoting effect on teaching effectiveness. This article first investigates the current situation of middle school music education, asks 300 students about their situation, and analyzes their views on traditional teaching; secondly, the article designs a series of innovative teaching activities that combine multimedia technology, including using music software for creation, analyzing music works using video resources, and conducting interactive classroom discussions; through comparative experiments, the article selectes two classes for teaching effectiveness evaluation, with the experimental class using multimedia teaching and the control class using traditional methods. The results showed that after multimedia technology teaching, students' classroom participation rate increased to 92%, their mastery of music knowledge increased by 20%, and they showed higher learning interest and enthusiasm. The introduction of multimedia technology has effectively enriched the forms of music teaching, enhanced students' learning motivation, and provided a feasible path for the innovative development of middle school music education.

1. Introduction

With the deepening of education reform, middle school music education is gradually receiving attention. However, current music education generally suffers from problems such as single teaching content, insufficient student participation, and lack of innovation, which limits students' interest in learning music and practical mastery ability. Traditional teaching methods often focus on teacher lectures and lack interaction and practice, making it difficult to stimulate students' creativity and musical expression. Therefore, exploring effective teaching strategies to improve the quality and effectiveness of music education has become an urgent task.

This article aims to study the innovative application of multimedia technology in junior high school music education and explore its promoting effect on teaching effectiveness. Through understanding the situation of 300 students, this article analyzes their views and feedback on traditional teaching, and identifies the shortcomings in current teaching. Subsequently, this article

designes a series of innovative teaching activities that combine multimedia technology, including using music software for creation, analyzing music works using video resources, and conducting interactive classroom discussions. This method not only provides rich learning resources, but also enhances students' sense of participation and learning motivation, which has important practical significance.

The article will provide a detailed introduction to the research background and relevant literature review, elaborate on the research methods and implementation process, and present experimental results and data analysis. Finally, the research conclusions will be summarized, and prospects and suggestions for future music education will be proposed.

2. Related Work

The application of multimedia technology in education is becoming increasingly widespread, providing new perspectives and methods for teaching reform in various disciplines. Xu Yinghui demonstrated through specific implementation in multimedia technology courses that diversified evaluation strategies are conducive to promoting process based teaching, enhancing students' learning interest and initiative, and effectively supporting the achievement of comprehensive educational goals[1]. Zhai Guijuan briefly analyzed the shortcomings of traditional medical imaging teaching, and focused on the advantages and disadvantages of the combination of multimedia technology and traditional teaching in the reform of modern medical imaging teaching. She also proposed improvement measures to promote the application and development of multimedia technology and traditional teaching in the reform of medical imaging teaching[2]. Huang Wei believes that the intervention of virtual dance forms, media based field construction, interactive dance figures, and other technologies possessed by multimedia technology can enhance its unique artistic expression and infectiousness[3]. Liu Wenting leveraged the advantages of modern multimedia education technology to set the slope, and based on the learning situation, conducted training for all students, achieving layered guidance, layered observation, and layered presentation, thus creating a platform for multi-directional and three-dimensional communication and interaction between teachers and students, allowing students to have a broader platform for expression and making the process of students' writing more interesting[4]. Zhang Dongjie proposed that the classroom introduction process is the beginning of the classroom, and the method of introduction will directly affect students' interest in learning art knowledge. In this regard, teachers should actively use multimedia technology to introduce new lessons, laying the foundation for the smooth development of the classroom[5]. Pendergast S conducted a survey on the preferences of middle school students for various music learning conditions and middle school music courses, as well as a survey on the preferences of middle school students for various music learning conditions and middle school music courses[6]. Camlin D A explored the impact of this "transformation" on music educators and their students/participants, and emphasized some ways in which music researchers and educators can respond to crises [7]. Daubney A discussed how schools and teachers had to suddenly shift towards primarily online formats, and their impact on music teaching and learning [8]. Hasanova N K discussed the uniqueness and possibilities of music education and cultivation in the formation of personal maturity[9]. Calderón-Garrido D analyzed how music teachers in compulsory education in Spain adapt, and conducted a survey of 335 teachers to collect data [10]. Through the exploration of multimedia technology, this article provides practical experience and theoretical support for educational reform, promoting teaching innovation and development.

3. Method

3.1 Investigation and Data Collection

This article provides an in-depth understanding of the views and needs of 300 junior high school students towards traditional music education, covering multiple dimensions including students' interest in music courses, participation, satisfaction with teaching content, and expectations for multimedia technology in the classroom. The opinions of students are processed through quantitative and qualitative analysis [11]. Quantitative analysis includes counting students' frequency of choosing different questions and using charts to display overall trends. Qualitative analysis focuses on students' answers to open-ended questions and extracts their opinions and suggestions on current teaching. Through analysis, it was found that most students believe that traditional teaching methods are single and classroom participation is not high, and they hope to introduce richer multimedia resources. The feedback results provide important references for the design of subsequent multimedia teaching activities, making them more in line with students' needs and enhancing the interactivity and fun of the classroom. This survey not only provides a solid data foundation for research, but also points out the direction for improving middle school music education.

3.2 Creating with Music Software

This article introduces the easy-to-use software GarageBand, allowing students to create music in the classroom. Firstly, the teacher demonstrates to the students the basic functions of the software, including track addition, instrument selection, and rhythm arrangement. Next, students can engage in group creation based on specific themes or emotions, fully unleashing their imagination and creativity. During the creative process, students can experience the diversity of music combinations by trying different timbres and beats. Teachers provide guidance and feedback during this process to help students improve their works. In the final stage of the classroom, students are arranged to showcase and share their music works, promoting communication and learning[12]. This type of activity not only enhances students' technical skills, but also improves their teamwork ability and confidence. Through music software creation, students demonstrate higher levels of participation and satisfaction. According to classroom feedback, a survey was conducted on the students' situation, and the results are shown in Table 1:

Table 1: Classroom feedback status

Item	Average Score	Satisfaction	Improvement Percentage	Participation
Learning Interest	4.2	80%	20%	85%
Technical Skills	4.0	75%	25%	80%
Teamwork Ability	3.8	70%	15%	78%
Creativity	4.5	85%	30%	88%
Music Understanding	4.1	75%	25%	82%

80% of students believe that music software has increased their interest in learning, 75% of students indicate a better understanding of music structure, and 85% of students are willing to continue using these tools in future courses.

3.3 Utilizing Video Resources to Analyze Music Works

In multimedia teaching activities that utilize video resources to analyze music works, taking "Chopin Nocturnes" as a specific case, through video analysis, students can gain a deeper understanding of the emotional expression and structural characteristics of music works[13]. Firstly, the teacher plays a high-quality performance video of *Chopin's Nocturne* in class, selecting versions by renowned pianists such as Alfred Brendel or Marta Argerich to ensure high levels of sound quality and expressiveness. During the playback process, the teacher guides students to pay attention to the rhythm changes, melody direction, and emotional involvement of the performer, emphasizing the dynamics and delicacy in the music. Then the teacher pauses the video and uses visualization tools to display relevant clips of the music score, helping students combine auditory experience with visual data to analyze the relationship between harmony, melody, and rhythm of the music. At this point, the teacher can use a projector to display the music score and point out key music terms such as "soft" and "gradually strengthening" through the markings on the score, guiding students to discuss the emotional changes in the music and their manifestations during performance. In addition, teachers can also introduce close-up shots of the performer's hand movements in the video, allowing students to observe the connection between performance skills and musical expression, and discuss how to express musical emotions through technology. To deepen the impression, teachers can organize group discussions where students can share their understanding and feelings about the music, and encourage them to express their personal opinions in the analysis[14]. Finally, as a summary of the activity, teachers can ask students to choose a piece of music they like after class, analyze it using similar methods, and prepare to share their findings in the next class.

3.4 Interactive Classroom Discussion

Teachers can choose a music theme that is relevant to the current learning content, such as "The Relationship between Music and Emotion", and use a short introductory video at the beginning of the class to arouse students' interest. The video can be a combination of famous music clips and corresponding emotions. Next, teachers encourage students to share their initial feelings about the video content, using open-ended questions such as "What emotions do you think this music conveys?" to guide students to think. During the discussion process, teachers should actively listen to each student's viewpoint, supplement relevant knowledge in a timely manner, provide music terminology and background information, and make the discussion more rich.

To enhance the interactivity of the discussion, students can be divided into small groups of 4 to 6 people each, engaging in in-depth discussions around specific issues, such as the role of different musical instruments in emotional expression. After each group discussion, a representative is designated to share the group's viewpoint, and the teacher should ensure that each group has the opportunity to speak and create an inclusive discussion atmosphere. During the sharing process, teachers can use whiteboards or projectors to record the viewpoints of each group in real-time, facilitating further discussion among the entire class. At the end of the discussion, teachers can guide students to summarize the results of the discussion and ask reflective questions, such as "How does music affect your emotions in your daily life?" This approach not only deepens students' understanding of music through interaction, but also cultivates their critical thinking and expression abilities. Finally, teachers can assign relevant homework and require students to write a short essay, reflecting on the relationship between music and emotions based on classroom discussions, in order to further consolidate their learning outcomes[15].

4. Results and Discussion

4.1 Experimental Implementation Process

The experimental subjects of this article are two groups of junior high school students, each consisting of 30 students. The experimental class uses multimedia technology for music teaching, while the control class uses traditional teaching methods. Before the experiment, the teacher conducted the same music knowledge foundation assessment on two groups of students to ensure that their knowledge levels were similar at the beginning of the experiment. Next, the teaching activity design of the experimental class includes interactive classroom discussions using multimedia technology, video analysis, and the application of music creation software. At the beginning of each class, the teacher plays relevant music clips, guides students to think through multimedia presentations, and encourages them to participate in discussions. In the classroom, teachers adjust teaching strategies by providing real-time feedback and observing student participation to ensure that every student actively participates.

During the four week experiment, three classes were arranged per week, with small quizzes conducted after each class to assess students' learning interests and mastery of music knowledge. Students in the experimental class are required to complete homework related to the classroom content after each class, such as creating using music software and sharing and discussing it in the next class. Teachers use multimedia tools to showcase students' works to enhance their sense of achievement and learning motivation. In contrast, traditional classes mainly focus on lectures and exercises, with relatively less classroom interaction and lower student participation. After the experiment, a comprehensive evaluation will be conducted on two groups of students, including classroom participation rate, mastery of music knowledge, and changes in learning interest. This paper analyzes the data, uses statistical software to process the experimental results, and compares the performance difference between the experimental group and the control group.

4.2 Evaluation of Teaching Effectiveness

4.2.1 Classroom participation rate

Figure 1 shows the results of the classroom participation rate survey:

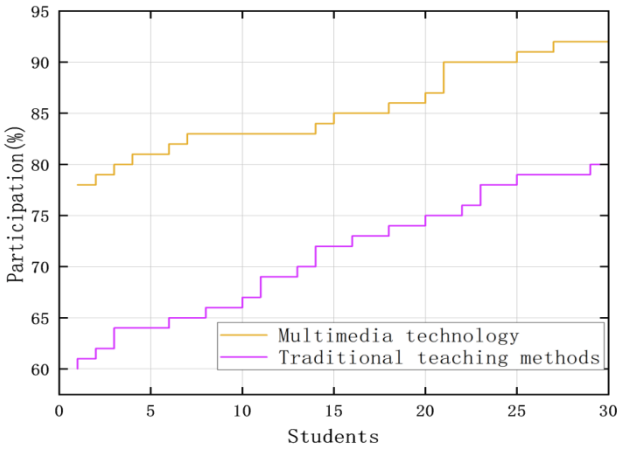

Figure 1: Student participation

According to the student participation data tested after the experiment, the participation of the

multimedia technology group is significantly higher than that of the traditional teaching method group, with the former's participation ranging from 78% to 92% and the latter ranging from 60% to 80%. Specific analysis shows that the participation rate of students in all multimedia technology groups is concentrated at over 80%, and the participation rate of most students is 85% or above, reflecting that multimedia teaching significantly improves students' classroom participation and enthusiasm. In contrast, the participation rate of the traditional teaching method group is generally low, especially among students with a participation rate between 60% and 70%, indicating that traditional methods cannot effectively stimulate students' interest and participation in learning.

4.2.2 Knowledge mastery level

After a one month experiment, students' knowledge mastery level was evaluated through a test paper, with a maximum score of 100 points. Figure 2 shows the test results:

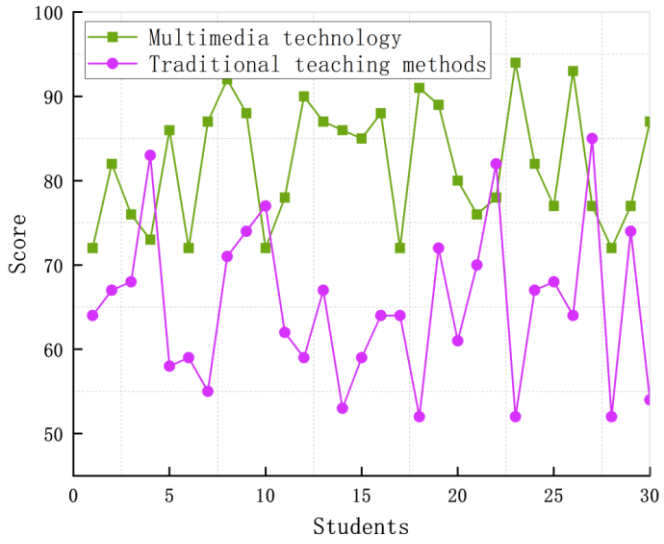

Figure 2: Knowledge mastery level

The average score of students in the multimedia technology group is higher than that in the traditional teaching method group, with a score range between 55 and 94 points, while the control group is between 52 and 85 points. Several students in the multimedia group achieve high scores of 90 or above, reflecting their strong understanding and application ability of the learning content. In contrast, there is a significant score difference among students in the traditional teaching method group, with most students scoring between 60 and 70 points, indicating a generally low level of knowledge mastery. Several students even score below 60 points, demonstrating the shortcomings of traditional teaching in effectively imparting knowledge. The application of multimedia technology in music teaching has increased students' knowledge mastery by 20%, which further supports the importance of multimedia technology in improving students' learning effectiveness and knowledge mastery. It emphasizes the necessity of adopting diversified teaching methods in educational practice to better meet students' learning needs and improve overall teaching quality.

4.2.3 Changes in learning interest

Recording students' interest in learning music and divide the level of interest into 5 levels, defined as 1-5, where 5 represents the highest level of interest and 1 represents the lowest level.

Figure 3 shows the survey results:

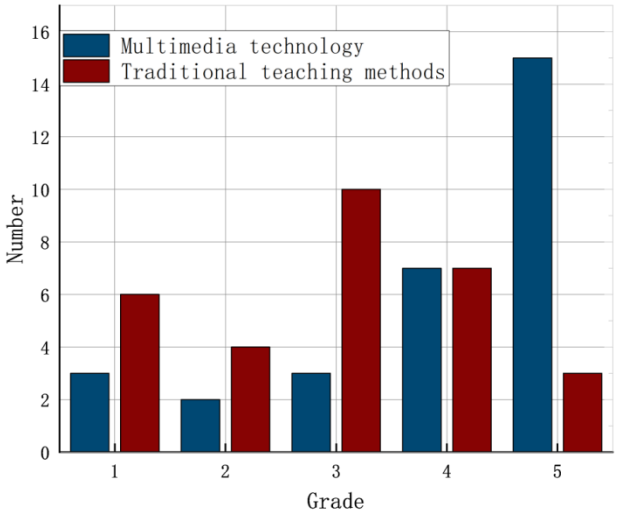

Figure 3: Level of Interest

The number of students in the multimedia technology group at the highest interest level (level 5) is significantly higher than that in the traditional teaching method group. The former has 15 students who expresses an interest level of level 5, while the latter has only 3, indicating that multimedia technology can effectively stimulate students' interest in learning. Relatively speaking, traditional teaching methods have a higher number of students in low interest levels (level 1 and level 2), with 6 students in level 1 and 4 students in level 2. In contrast, the multimedia technology group has 3 and 2 students in these two levels respectively, indicating that traditional teaching has not effectively attracted students and has led to a lower interest in music learning among more students. Overall, students in the multimedia technology group show higher levels of enthusiasm and participation in terms of interest, which further emphasizes the importance of using multimedia technology in music education to enhance students' learning motivation and interest.

5. Conclusion

This study explores the application of multimedia technology in middle school music education, and the results show that multimedia teaching significantly enhances students' learning interest and knowledge mastery. Through comparative experiments, students using multimedia technology performed better in classroom participation, knowledge testing, and interest surveys compared to the traditional teaching method group, verifying the effectiveness of multimedia technology in stimulating students' learning enthusiasm and improving teaching effectiveness. This study not only provides new teaching ideas for music education, but also points out the direction for future educational reforms. In the future, with the continuous advancement of technology, music education can further integrate emerging technologies such as virtual reality (VR) and augmented reality (AR) to create richer and more immersive learning experiences for students.

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