

# Research on the Application of "Internet Plus" and Artificial Intelligence in Middle School Music Teaching

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**Abstract.** With the gradual development of "Internet plus" and artificial intelligence technology, educational and teaching means are becoming more and more abundant. The author conducts in-depth analysis by analyzing the current situation of music education in middle schools and the development of internet education technology, and proposes optimization suggestions. Through the research, the "Internet plus" technology has a positive role in promoting the innovation of teaching methods in music education in middle schools, improving students' interest in learning, and enriching teaching content.

**Keywords:** Middle school music, music teaching, internet, artificial intelligence.

## 1. Introduction

The concept of "Internet +" was first proposed in China in 2012, and was mostly applied to economic and financial fields in the early stage. However, with the development of the society, and the need for educational reform and development, the concept of "Internet plus" has been gradually integrated into education and teaching. Through the analysis of the current status of technology and education, the inevitability and ways of the application of "Internet +" in teaching are expounded. By conducting a survey questionnaires, the opinions and viewpoints of middle school students and teachers are collected for in-depth analysis.

"Internet Plus" usually refers to "the process of application and diffusion of a set of information technology based on the Internet in various sectors of economic and social life." On the other hand, Internet education is based on the concept of "Internet plus" and integrates with education related concepts. The cross-field cooperation between the two has had a profound impact on the teaching environment, content, student learning evaluation, management, teacher development, etc., and has promoted systemic changes in the mainstream business of education. (Data from the internet)

## 2. "Internet Plus " Education

### 2.1. Current Situation of "Internet Plus" Education Development

The research on "Internet plus" education mainly focuses on both theoretical and practical aspects. From a theoretical point of view, scholars have different opinions on the connotation of "Internet plus" education. However, the representative point of view is that in the "Internet plus" education model, education goals are injected into the Internet through information network technology, so as to better achieve the goal of cultivating talents. Until now, the teaching models of "Internet plus" education that can be practiced include "flipped classroom", "MOOC", "cloud platform", etc. The development and application of the above models, while giving play to the advantages of Internet big data that can transcend time and space constraints, also alleviates the teaching problems caused by the uneven distribution and quality of teachers between regions to a certain extent.[1]

### 2.2. "Internet Plus" Music Education

The "Internet plus" music education stems from the "Internet plus" education and is combined with the relevant content and demands of music education. The basic connotation of "Internet plus" education incorporates the special needs of music education and other disciplines. For example,

compared with other cultural courses, music teaching requires students to gain more understanding of music through their own practical operations. And the teaching content includes listening to music, playing instruments, body movements, singing, and other aspects.[2]

Through music education under the "Internet plus" mode, students can not only have a deeper understanding of the teaching content, but also analyze students' learning progress, respect the differences between students, and evaluate students' learning in stages and degrees.

### 2.3. Artificial Intelligence (AI) and ChatGPT

Artificial intelligence, an emerging discipline based on computer science and integrated by computers, psychology, philosophy and other disciplines, is a new technical science that studies and develops theories, methods, techniques and application systems that simulate, extend and extend human intelligence. The research content includes robotics, language recognition, image recognition, natural language processing, etc. [3]

On the other hand, ChatGPT is a natural language processing tool driven by artificial intelligence technology, newly launched by OpenAI that is an artificial intelligence laboratory in the United States. It can engage in dialogue through understanding and learning human language, and even complete tasks such as copywriting, code, email and script writing.

Compared with artificial intelligence, ChatGPT will be more widely used in culture, academia, knowledge and other aspects, but there is still some controversy about the originality of ChatGPT in terms of academic aspects. The application of artificial intelligence and ChatGPT to the music teaching process can greatly improve the teaching efficiency and effect.[4]

## 3. Analysis of the Current Situation and Weaknesses of Music Teaching in Middle Schools

### 3.1. The teaching method is relatively single

The author conducted a questionnaire survey on two groups of middle school music teachers and middle school students. Based on the survey results, the following conclusions were drawn:

In the questionnaire of teachers, the teaching method often used in music education teaching activities is mainly listening to music, which is the teaching method that all music teachers will use. Following, singing, watching videos, singing music and other methods are also used in the classroom with a very high frequency, like Figure 1.

Compared to other teaching methods, the teaching method of "using different instruments for ensemble" is also involved in daily teaching life, but the frequency of use is lower.

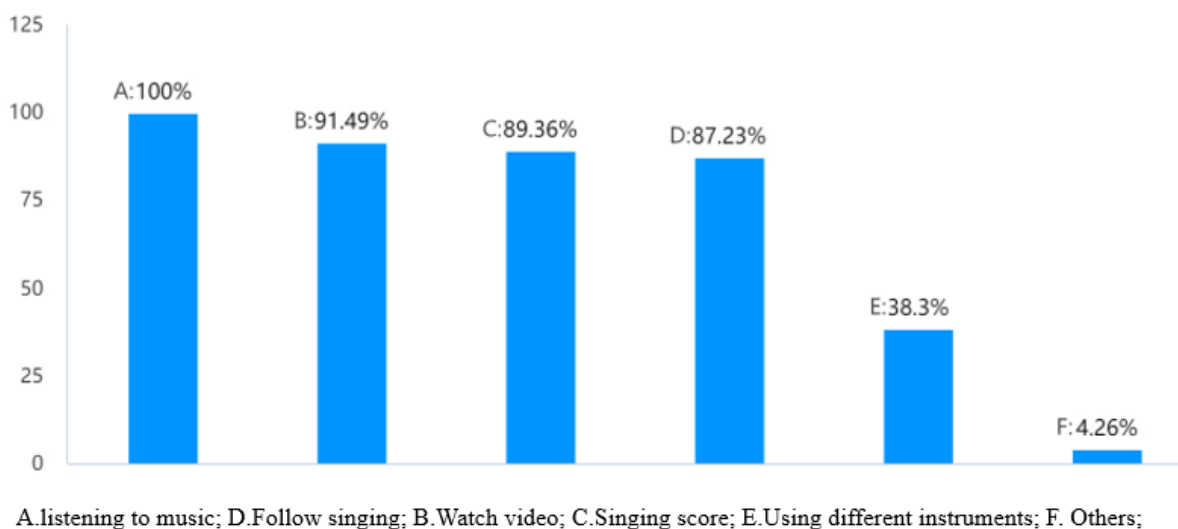
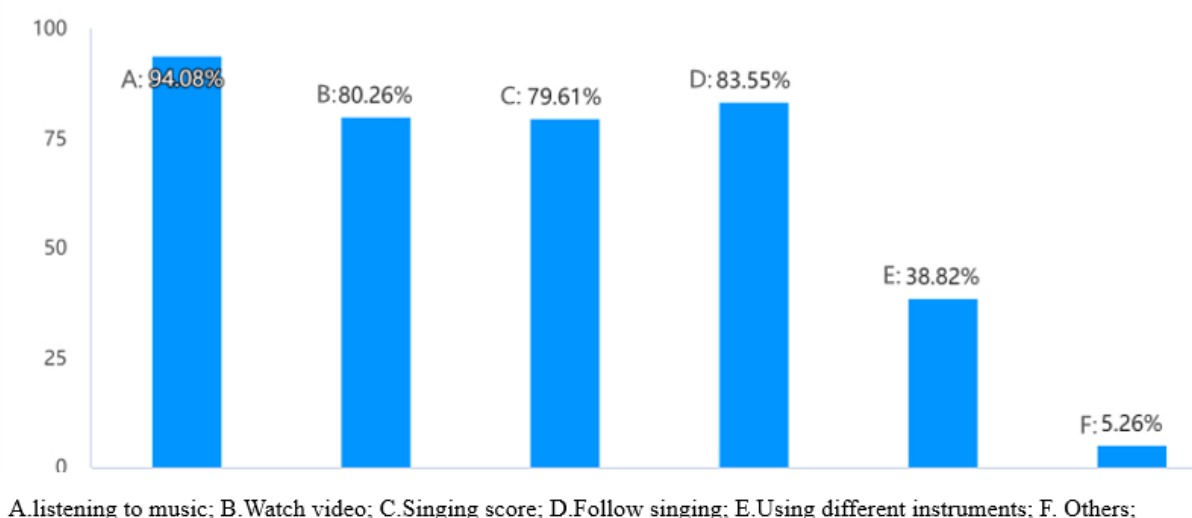


Fig. 1 Common Ways for Teachers in Music Teaching

Meanwhile, through student feedback on the common teaching methods in the classroom, the author learned that listening to music is still the most common teaching method from the perspective of students. However, compared with the teachers' questionnaire, the selection rate of questions in the student questionnaire was only 94.08%, and 5.92% of the students did not pay attention to or participate in the teaching session of "listening to music" in class, like Figure 2. The proportion of singing, singing, and watching videos is still high, and it is the most commonly used teaching method in middle school music classroom teaching. In addition, the proportion of singing along, singing music scores, and watching videos is still very high, which is the most commonly used teaching method in middle school music classrooms.

In the answer to this question, some students added that teachers would deepen their understanding of music knowledge by drawing during class, but it was only a rare case.



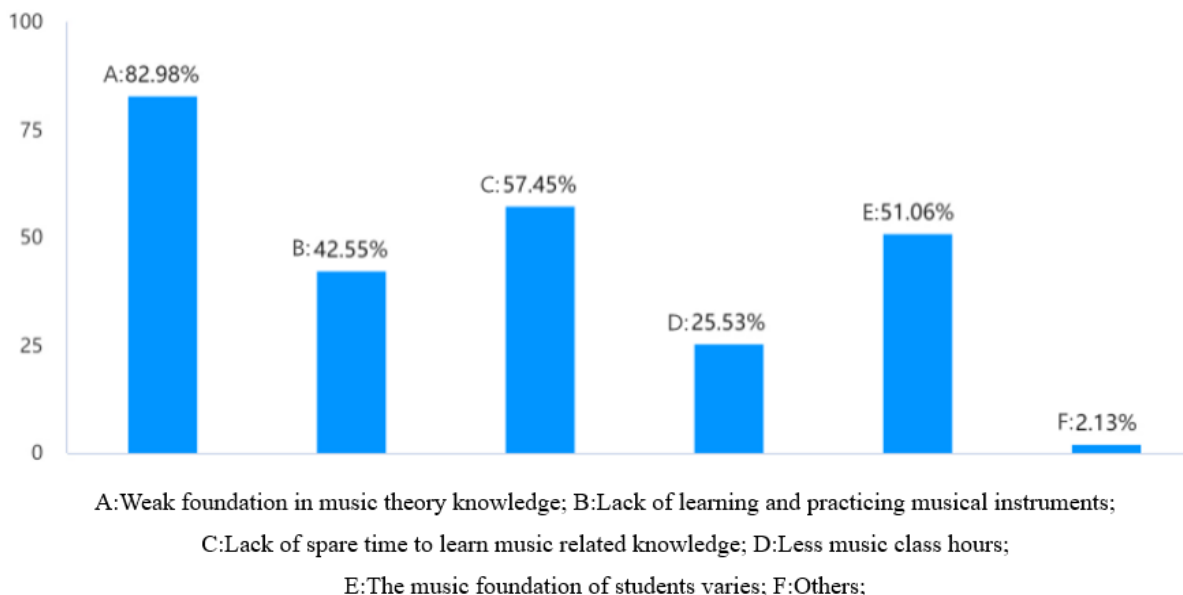
**Fig. 2** Common Methods in Music Teaching from a Student Perspective

On the basis of the above-mentioned analysis, the author knows that the main teaching method of music education in middle schools is still based on music listening, the teaching method is relatively single, with the serious systematization and lack of innovation, and the attraction of students' interest in learning is becoming weaker.

### 3.2. Difficulties in teaching stratification

In the teachers' survey questionnaire, the author set the question "What are the common problems that students often encounter in music learning under the current education model." As shown in Figure 3, among the answers of this question, 82.98% of middle school music teachers believe that the problem of weak theoretical knowledge related to music is the most common problem that students face during the learning process.

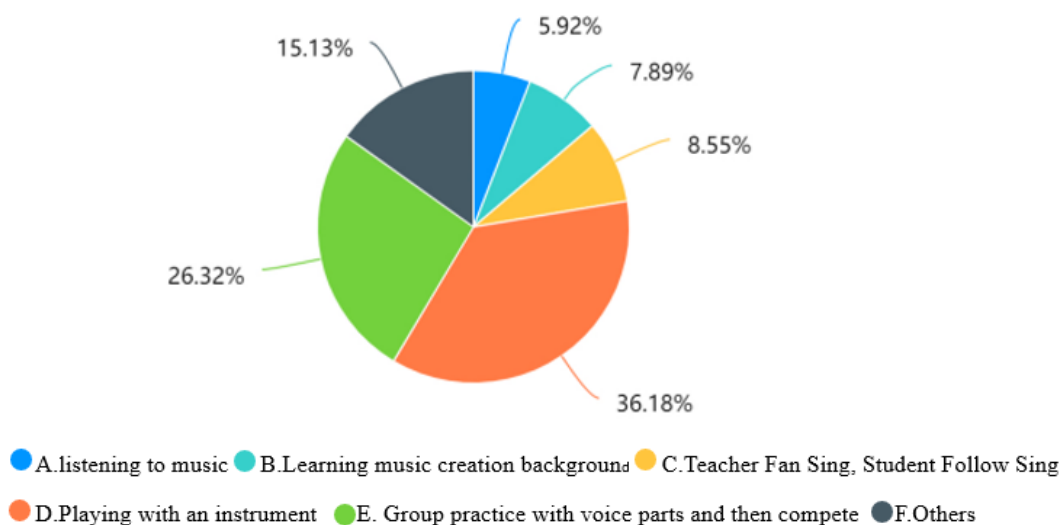
Secondly, the two questions that are "Some students lack the conditions to learn music in their after-class time" and "Students' music foundation is uneven, making it difficult to develop teaching content suitable for each student" also accounted for more than 50%. It is not difficult to find that from the perspective of teachers, in the process of students' learning, teachers often encounter the situation, such as a lack of theoretical knowledge, less interest in music and less time. Students' learning progress and knowledge base are uneven, resulting in difficulties in teaching stratification.



**Fig. 3** Common problems in students' learning process

### 3.3. Inadequate teaching practices

In the students' survey questionnaire, the author also raised the question "Which part of the music classroom does not feel effective in the learning process?" Regarding this question, according to Figure 4, 36.18% of students believe that learning music knowledge through playing instruments is not effective, followed by group vocal practice and other aspects. In this option of other questions, some students stated that it takes longer time to learn a song because they sing out of tune. It can be seen that compared with traditional theoretical knowledge learning, students have a lower interest in participating in classroom activities that highlight personal performance and characteristics, and due to various reasons such as limited accumulation of music related knowledge and weak musical expression ability, students' participation and learning effectiveness in traditional teaching models in music classrooms are relatively low.



**Fig. 4** Poor performance in music classes

Through the analysis of the above survey results, we can know that the main problems that teachers and students face in the classroom learning process revolve around the lack of music theory and practical experience. Aiming at the problems of students' lack of music theory knowledge leading to difficulties in understanding classroom teaching content and students' lack of experience and

opportunities to actually operate musical Instruments, the following solutions are provided by using "Internet plus" and artificial intelligence technology.

## 4. Ways of "Internet plus" Empowering Middle School Music Teaching

### 4.1. Gaming-style 3D Immersive Situational Teaching

With the development of society and the need for people's spiritual entertainment life, more and more game modes have been developed. It also provides assistance for building 3D immersive situational teaching.

Through the use of 3D data modeling and AI's big data comparison and analysis functions, a restored historical environment is jointly constructed, helping students immerse themselves in the music background story, experience the style of the era, and more conducive to experiencing the characteristics of music.

At the same time, constructing the composer's creative story can let students follow the composer to experience important events and jointly understand the purpose and emotional connotation of music creation. While attracting students' interest in learning and increasing the degree of classroom interaction, students' learning effectiveness has also been greatly improved.

There are a mounting number of music games. In addition to the well-known falling touch music rhythm games represented by "Rhythm Master", there are also music parkour games such as "Muse Dash", and difficult single-button rhythm games such as "A Dance of Fire and Ice". They can adapt to the learning needs of students of different age groups in various difficulties. And some games can use the function of "Creative Workshop" in the game platform to edit songs and accompanying score making, which can be more closely integrated with the textbook content.

On the other hand, with the continuous development of 3D and VR technologies, its supporting facilities and software have also continued to improve, and music games in VR somatosensory games have also been continuously developed. Taking the game "Maestro: The Masterclass", which is currently under development, as an example, it is a game that can allow players to play the role of a conductor through VR devices and experience directing an entire band to complete a song performance. Meanwhile, users can also edit the melody as they want to experience in this way through the "Creative Workshop", and connect to the game, so that students enable to use the platform of the game to experience the orchestra conductor that can usually only be watched through video, and students learn about music while enriching the classroom teaching mode.

In terms of musical instruments, VR can also be a big boost. The game "Paradiddle" is that by building a drum stand in the virtual world of VR, users can capture and perform the drum stand within the game. At the same time, the game also supports customization of melody. If these games can be applied to the classroom, they can greatly alleviate the problems of low interest in learning, insufficient configuration of musical instruments, single classroom content, large differences in student foundation, and difficulties in carrying out targeted teaching in the current middle school music teaching classroom.

Taking Chapter 4 of Grade 7's textbook of the People's Education Press as an example, the course requires appreciation of Movement 4 "Trout". For the traditional teaching method, it mainly focuses on watching videos and listening to music to achieve this course purposes. The addition of games not only enriches classroom content, but also greatly enhances students' interest in learning. Piano Block 2, as a drop down music game, has lower difficulty and is more suitable for the vast majority of people. In the game, there is the symphony "Trout".

In the process of the game, students not only unconsciously listen to music many times to improve their sense of rhythm, but also improve their concentration and strengthen their perception of music due to the existence of the game. After successfully completing the practice of "Piano Block 2", they can take advanced practice in the game "A Dance of Fire and Ice".

At the same time, combined with the teaching theme of "Symphony" in this chapter, the VR game "Maestro: The Masterclass" by a simulated conductor is used to try to complete the conduct of a

symphony. According to the prompts in the game, make corresponding body movements with the rhythm of the music, and complete the direction of "Messa di Requiem, Dies irae: Dies irae", which allows students to enjoy the music while feeling the characteristics of the symphony. Edutainment, the inclusion of games makes students more willing to participate in the classroom and achieve teaching goals more efficiently.

## 4.2. AI-assisted Music Creation

The development of Internet technology can naturally drive the progress of artificial intelligence technology. AI technology represented by ChatGPT has gradually developed and improved, and it is more proficient in linking with big data. Therefore, AI can already make new artistic creations on this basis through a lot of learning.

With artificial intelligence technology, through the features of continuous learning by artificial intelligence, it can learn and analyze the features and characteristics of the tracks, create similar styles of tracks through the features, and then promote students' understanding and appreciation of the essence and features of music through listening and contrast.

And through the continuous learning of artificial intelligence and big data, AI has become increasingly proficient in grasping different styles of music works. Additionally, AI can intelligently identify problems in the music creation process as well as problems in the music. At the same time, AI can also generate complete music on request, providing ideas and references for creators.

From July 6th to 8th, 2023, the 2023 World Artificial Intelligence Conference (WAIC 2023) was held in Shanghai. At the conference, Tencent Multimedia Lab released its self-developed AI universal composition framework, XMusic, for the first time. Based on AIGC technology, users can generate high-quality music with controllable emotions, styles and rhythms by simply uploading videos, images, text, tags, humming and other content, which can significantly reduce the threshold for music creation. (Data from the internet)

This framework can form a harmonious and beautiful piece of music through an image, a paragraph of text and a hum. Compared to searching for the name of a music piece first, this framework can make it more convenient and efficient for users to obtain the music they need. When applied to daily middle school music education, the framework can better refine the key and difficult points in teaching, and derive similar music forms based on this, to strengthen learning and to make students' mastery of learning difficulties more rapid and accurate.

## 5. Conclusions

"Internet plus" and artificial intelligence can have a great impact on music classes in middle schools. The application of "Internet plus" technology can enrich the classroom teaching mode and make the teaching content more colorful. Concurrently, it can make the teaching content more suitable for students' learning needs, improve the pertinence of classroom teaching, teach students according to their aptitude, and enhance the interaction between teachers and students in the classroom.

For teachers, the development of "Internet plus" technology is more crucial to improve students' interest in learning in the classroom. In addition, it is subject to the limitations of music teaching facilities, and students do not have the opportunity to contact or even master the playing methods of musical instruments when students do not learn other musical instruments outside of class. "Internet plus" allows students to be exposed to more knowledge about music while deepening their understanding of the subject of music. But it also has a certain negative effect on music education at the same time. On the one hand, the promotion of "Internet plus" educational technology makes most music teachers need to learn more theoretical knowledge about computers. At this stage, most music teachers have limited computer technology, so it is difficult to combine the current teaching content with "Internet plus" technology. On the other hand, the promotion of "Internet plus" requires interactive electronic devices in music classrooms, and it is also difficult to achieve the popularization

of "Internet plus" education technology. Most teachers believe that the application of "Internet plus" education technology in the classroom will distract students in the classroom, and will also increase the burden of teaching content, indirectly causing students to be difficult to adapt, reducing learning efficiency and further hindering the progress of teaching.

As far as students are concerned, they think that the emergence of the "Internet plus" teaching model can better improve their learning enthusiasm in music classes, and at the same time, many of students have responded to the "weak music foundation", "They can not understand in class", "singing out of tune" and other problems that have been solved. While solving students' learning difficulties, it also better improves the quality of students' learning and makes education more effective. However, some students believe that having additional computer skills is more difficult compared to traditional teaching methods.

In conclusion, "Internet plus" and artificial intelligence have considerable feasibility and advantages in the field of middle school music teaching. However, the drawbacks still exist, and we still need to continue to research, explore, perfect and improve the technology.

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