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# Analysis of Artificial Intelligence Technology Empowering the Teaching of Music Appreciation Classes in Junior High Schools under the Background of Educational Informatization

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## Abstract

**The application of information technology, especially artificial intelligence (AI), enables the music appreciation classes in junior high school to be richer and more comprehensive in the aspects of teaching content, resource design and personalized teaching. Artificial intelligence technology helps to improve the teaching efficiency and enhance the active participation of students through intelligent analysis, resource recommendation and interactive feedback. In this paper, the importance and practical significance of artificial intelligence-empowered music appreciation class are explored, and specific teaching methods based on flipped classroom and online and offline integrated teaching model are proposed, which provides practical reference for music teaching innovation empowered by artificial intelligence.**

## Keywords

**Educational Informatization; Empowerment by Artificial Intelligence Technology; Music Teaching for Junior High School; Appreciation Class.**

## 1. Road of Music Teaching Reform Empowered by Information Technology in Junior High School

The road of music teaching reform in junior high school empowered by information technology begins with the introduction of the concept of educational informatization. Professor He Kekang of Beijing Normal University proposed that information technology should be used to promote the dual reforms of teaching methods and learning methods, and emphasized the deep integration of digital content into subject courses[1]. From the practical exploration of flipped classroom in the field of basic education in 2014 to the rise of massive open online course in 2016 to promote the opening and sharing of educational resources, and then to the breakthrough application of generative AI technology (such as DeepSeek, Doubao, etc.) in 2024, music teaching in junior high school has experienced progressive transformation from technical integration to intelligent empowerment. Currently, generative AI can realize diversified appreciation of music works, intelligent creative guidance, and real-time evaluation feedback, promote the deep integration of technology and art, and constantly expand the teaching boundaries and educational possibilities of music classrooms.

## 2. Practical Significance of Empowering Music Appreciation Classes with Information Technology in Junior High School

Information-based teaching is the general trend of reform for basic education, and is of great practical significance for promoting the integration of information technology and music courses, developing the core literacy of students and transforming the learning methods. The spatio-temporal limitations of traditional teaching can be broken via technological empowerment, providing the immersive and interactive innovation path for music education.

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As the core of the curriculum system, music appreciation course in junior high school accounts for more than 40% of the textbook content[2]. It focuses on the cultivation of core literacy such as timbre recognition, emotional experience and cultural understanding. The visual presentation of music elements can be realized by adopting information technology. In addition, on the interactive environment can be constructed with the interaction between music teaching system and AI voice,which can provide a practical platform for students to participate in music performance and creation in real time, and significantly enhance classroom participation and learning interest. Moreover, the role of teachers has also transformed from that of knowledge transmitters to learning designers, forming a two-way growth path of "enhancing students' literacy while promoting their own professional development" and injecting core impetus into the modernization transformation of music education.

## 3. Teaching Path of Empowering Music Appreciation Classes in Junior High School with AI Technology

Based on the characteristics of music curriculum and the author's practice and research experience in Chengdu No. 7 Middle School, this study summarizes and puts forward the specific teaching path of - music appreciation course empowered by AI technology based on two teaching models.

(1) Music Appreciation Teaching based on Flipped Classroom

1) Characteristics of music flipped classroom under the background of informatization

Flipping the classroom returns the learning dominance to students by reconstructing the time allocation inside and outside the classroom, allowing students to understand music works based on individual experience, and teachers promote the collision of thinking through guidance rather than indoctrination; The 5-10 minutes AI micro-class focuses on specific knowledge points (such as repertoire background, instrument evolution or performance skills); The process is optimized to form a closed loop of "preview-inquiry-consolidation"[3]. By mastering the basic knowledge before class, conducting in-depth discussions around key and difficult points in class, and strengthening practice by using resource library after class, the problems of low efficiency and insufficient consideration in traditional classrooms can be solved.

2) Implementation path of flipped classroom in the subject of music

Teaching preparation requires accurate orientation of teaching objectives and key and difficult points, integrating music cultural background, creative techniques and other materials, generating intelligent dialogue agents by adopting AI technology to assist knowledge transfer, thereby improving the resource production efficiency with the AI composition tools and speech recognition system. The teaching process is based on AI analysis of pre-class learning data to design a step-by-step problem chain to guide critical thinking and creative expression. With the help of AI, knowledge point maps are automatically generated and real-time feedback learning effects are reviewed and exercised, and the music perception experience is enhanced through virtual performance simulation. The construction of the evaluation system includes diagnostic assessment to establish a baseline of students' ability, dynamically track progress by combining classroom observation and AI learning analysis, adopting multi-dimensional assessment of "knowledge assessment + work creation + performance practice", introducing the mutual evaluation mechanism, and focusing on the development of aesthetic competence and humanistic literacy.

(2) Music Appreciation Class Teaching Based on Online and Offline Integration[4]

1) Characteristics of online and offline integrated teaching model

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The model is characterized by diversified resources, diversified evaluation and autonomous learning. By integrating official resources such as Sichuan Cloud Education Platform and National Public Platform for Basic Education Resources, and combined with AI tools, intelligent reorganization and personalized push of teaching content are realized. For example, the learning platform can analyze the learning behavior data of students via AI technology and automatically generate track recommendation lists of different styles to meet differentiated learning demands. Through the online learning platform, data such as student participation, interaction frequency, and homework completion quality are recorded in real time, and offline comprehensive evaluation is combined with classroom performance, works performance and other dimensions, thus forming a comprehensive and three-dimensional evaluation file.

2) Implementation strategy of online and offline integrated teaching model

The teaching and research group promotes teaching innovation through four strategies. Taking the teaching of "Capriccio on the Dabo River" as an example, first, question-based introduction is applied to stimulate the interest of students. With "rivers in memory" as the starting point, the teacher guides the students to share the stories of rivers in their hometown. Then, pictures generated with AI through keywords of "melting water in snow mountains" and "turbulence in canyons". "ethnic customs" to gradually outline the Dabo River, and students can feel intuitively and naturally enter the musical situation via synesthesia. Secondly, project-based learning is used to deepen understanding, and “Capriccio of Dabo River” is disassembled into three sub-projects: “National Costume Design”, “Life Scene Restoration” and “Custom Activity Planning”. Students complete tasks such as hand-painting Hui costumes and creation of Dabo life sitcoms with dialogue generation AI software (i.e. dreams, bean bags, etc.) through group collaboration, and understand the cultural connotation behind music in practice. In addition, a dynamic feedback mechanism is established, open tasks such as "creating a melody for Dabo River" are arranged through the online operating system, real-time feedback can be provided through music generative AI (music creation software such as Walker AI), and students' mutual evaluation activities are organized to cultivate aesthetic judgment. Moreover, the online interactive form is innovated, and the real-time contest of "Guessing the Musical Instruments" is used in the class of "Hundreds of Birds Pay Homage to the Phoenix ", and students can distinguish the timbres of musical instruments such as suona and flute by listening to clips. For operational topics, such as teaching of national musical instrument playing skills, the mode of "offline recording demonstration video + online real-time error correction" is adopted. After students upload practice videos, teacher can analyze fingering problems through AI motion capture technology and give suggestions for improvement.

## 4. Reflections on the Empowerment of Music Classroom Teaching with Artificial Intelligence Technology

Although the application of artificial intelligence technology in the field of music education in primary and secondary schools has gradually shown its potential for transformation, its development still has many constraints. Future study should focus on breaking through existing limitations, effectively avoiding the risk of teaching alienation, and promoting the deep integration of artificial intelligence technology and music teaching through interdisciplinary innovation.

(1) Limitations of Current Artificial Intelligence Technology[5]

At present, the application of artificial intelligence technology in the field of music education is still in the exploratory stage. Although related AI auxiliary tools such as singing voiceprint evaluation have appeared in the market, most of the existing solutions are limited to auxiliary teaching functions, and the system generally relies on algorithms, making it difficult to realize true personalized teaching. From the technical perspective, the existing AI music teaching

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auxiliary software has three limitations: First, the ability to accurately recognize the physiological characteristics of students needs to be improved; Secondly, the update of teaching strategy database lags behind, and it is difficult to dynamically match the cognitive laws of different learning stages; Thirdly, there is a lack of innovation in the emotional interaction section, it is unable to capture learners' emotional changes for teaching adjustment, and visualize and evaluate students' ability to acquire music perception.

(2) Differences in the Ability of Artificial Intelligence Technology Application Subjects[5]

The music learning system in the basic education stage includes two core modules: perceptual knowledge modules such as music element cognition and emotional experience perception, and theoretical knowledge modules such as music concept system construction. At present, some music AI technologies have realized the teaching support function of the music theory system, but there are still technical application gaps in music perception experience teaching scenarios. This imbalance in technological development poses double challenges to teachers' professional competence: they must not only master traditional music teaching methods, but also have the ability to integrate interdisciplinary knowledge. Through the creative use of existing AI tools, they must build a teaching environment that integrates virtual and real, and ultimately achieve the improvement of teaching efficiency and quality.

(3) Popularity of Artificial Intelligence Technology

At present, artificial intelligence technology has been widely penetrated into various industries of the society, but the popularity rate of AI empowerment in the field of music education is relatively low, and it faces multiple practical difficulties. The reasons are as follows: For example, in ensure that students focus on the deep learning of music itself during the AI-assisted music teaching process; Whether the application of music generation AI technology will inhibit the artistic creation thinking of students; The hardware investment cost of AI-enabled music teaching is too high. These contradictions are not only key challenges that restrict the deep integration of artificial intelligence technology and music courses, but also practical bottlenecks that must be broken through in exploring the popularization of intelligent music education in the future.[6]

## 5. Conclusion

Artificial intelligence (AI) technology has brought systematic innovations to junior high school music appreciation classes in terms of teaching content, resource design and personalized teaching. Through core functions such as intelligent analysis, resource recommendation and interactive feedback, it has effectively improved teaching efficiency and students' participation, and promoted the transformation of teachers' role from knowledge transmitters to learning designers. The two teaching paths proposed in this paper-based on flipped classroom and online-offline integrated teaching-have been verified by practice to solve the problems of low efficiency and insufficient differentiation in traditional teaching through the "preview-inquiry-consolidation" closed loop and the "resource integration-personalized push-three-dimensional evaluation" system, providing an operable solution for the in-depth integration of technology and music courses. However, the current application is still limited by practical bottlenecks such as insufficient technical accuracy, differences in teachers' interdisciplinary capabilities, and high popularization costs. In the future, it is necessary to optimize emotional interaction and personalized adaptation through technological iteration, strengthen the cultivation of teachers' technology integration literacy, and explore low-cost popularization paths to avoid the risk of teaching alienation. Only in this way can the empowering value of AI be fully released, promoting the in-depth transformation of junior high school music appreciation classes from "technical assistance" to "intelligent reconstruction", and contributing to the all-round development of students' core music literacy.

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