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# Application of AI in College Music Classroom from the Perspective of Hybrid Teaching

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**Abstract:** With the rapid advancement of information technology and artificial intelligence (AI), higher education curriculum reforms are deepening. The blended learning model, which combines online learning with offline classroom instruction, has demonstrated unique advantages in university music education. AI technology, with its capabilities in intelligent analysis, precise feedback, and personalized learning support, is set to inject new vitality into music education. This paper explores the application pathways, functional roles, and challenges of AI technology in university music classrooms from a blended learning perspective, providing theoretical and practical references for the digital transformation of music education.

**Keywords:** blended learning; artificial intelligence; music education in higher education; educational innovation; digital teaching

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## 1. Introduction

With the rapid advancement of internet, big data, and artificial intelligence technologies, music education in higher education institutions is undergoing unprecedented transformation. The traditional teacher-centered classroom model struggles to meet students' diverse learning needs and personalized development goals. The blended learning model, through the organic integration of online learning resources and offline classroom practice, provides students with more flexible and autonomous learning pathways, achieving diversification in learning time, content, and methods. Meanwhile, the application of AI technology in music education has gradually become a trend. Its intelligent analysis and feedback capabilities help teachers optimize course design, support personalized learning, and improve classroom efficiency and learning outcomes. AI systems can achieve functions such as automatic practice grading, real-time performance correction, and personalized resource recommendations, enabling students to receive instant feedback during self-study and enhancing their learning motivation and self-directed learning abilities. At the same time, AI technology can provide teachers with tools for teaching data analysis, learning progress monitoring, and visualized evaluation results, helping them make scientific decisions on teaching strategies and optimize classroom management and resource allocation. This combination of technology-driven innovation and blended learning lays a solid foundation for the transformation of music classrooms in higher education institutions. It also offers new ideas and methods for educational evaluation, curriculum design, and student competency development, driving the advancement of music education in higher education toward digitalization,

intelligence, and personalization<sup>[1]</sup>.

## **2. Key application areas of ai in college music classrooms**

### **2.1. Design of intelligent course resources**

AI technology performs in-depth analysis of students' individual aptitudes and dynamic learning behaviors, intelligently recommending tailored course resources. The system modularizes and reorganizes learning modules like music theory, sight-singing, and performance techniques, dynamically generating personalized learning plans that align with learners' actual proficiency and progress. This intelligent recommendation mechanism addresses the challenge of traditional teaching resources failing to accommodate learners at different levels, thereby enhancing overall classroom efficiency and learning outcomes.

### **2.2. Personalized learning guidance and interactive feedback**

AI systems can capture and analyze students' performance data in real time during practice, including rhythm, pitch, and tempo, providing targeted instant feedback. This includes automatic reminders for rhythm deviations, real-time correction of melodic performance errors, and generation of practice suggestions, enabling more precise personalized learning guidance. This human-computer interaction mechanism not only significantly improves students' learning experience but also enhances their motivation for self-directed learning, allowing learners to achieve efficient, repetitive, and adjustable practice processes in an AI-assisted environment<sup>[2]</sup>.

### **2.3. Data analysis and monitoring of the teaching process**

AI technology enables teachers to generate comprehensive visual reports through continuous data collection and multidimensional analysis of online learning platforms and classroom behavior. These reports cover learning progress, knowledge mastery, and classroom engagement, allowing educators to identify both common learning challenges and individual differences. This facilitates targeted adjustments to teaching strategies. The system provides real-time monitoring and effective intervention throughout the teaching process, significantly enhancing the scientific rigor and precision of educational management<sup>[3]</sup>.

### **2.4. Intelligent learning evaluation system**

Unlike traditional music classrooms that rely on teachers' subjective evaluations, AI-powered systems now establish objective data-driven assessment frameworks. These systems enable multidimensional quantification of students' musical skills, including precise rhythm control, pitch stability, and expressive feature extraction, significantly enhancing the scientific rigor and consistency of evaluations. Supported by extensive learning data, this mechanism not only provides a more comprehensive and equitable measure of student progress but also delivers reliable data for instructional refinement.

## **3. Hybrid teaching design strategies supported by AI**

### **3.1. Aligning learning objectives with AI capabilities**

When designing blended learning courses, educators should first conduct a thorough analysis of the syllabus to identify specific learning objectives. Based on these objectives, they should select AI tools that align closely with the goals. The functionality of AI tools must be seamlessly integrated with specific teaching tasks to achieve the goal of technology-enhanced instruction. For instance, in music education, an AI-based sight-singing and ear-training assessment system can be introduced to support students' self-directed learning and proficiency testing. By combining AI's real-time feedback mechanism with in-person classroom sessions, a closed-loop teaching process can be established, thereby improving

learning efficiency and outcomes<sup>[4]</sup>.

### **3.2. Optimizing the structure of online learning resources**

Leverage AI-powered intelligent resource recommendation systems to scientifically categorize and structure content including music theory, skill development, and composition analysis. Online learning materials should integrate foundational knowledge modules with progressive, challenging exercises, creating a step-by-step learning framework. This approach not only addresses students' personalized learning needs but also establishes a robust foundation for hands-on practice and interactive engagement in physical classrooms, achieving seamless integration between digital and offline learning resources.

### **3.3. Enhancing teacher-student interaction and collaborative learning**

In blended learning environments, AI technology should not replace teachers but serve as a vital teaching aid. Educators should skillfully utilize AI-generated data—such as learning analytics and behavioral tracking—to dynamically adjust instructional strategies and pacing, effectively guiding students toward deep learning and collaborative group discussions. By thoughtfully designing AI-supported interactive activities, teachers can enhance communication and collaboration between educators and students, as well as among peers, thereby boosting classroom engagement and overall teaching quality.

### **3.4. Establishing a formative assessment system**

Leveraging AI-powered data collection, processing, and analysis capabilities, we develop a dynamic, multi-dimensional evaluation framework that integrates formative and summative assessments. This system emphasizes continuous monitoring of students' learning progression, embedding formative evaluation throughout all teaching activities. It transforms assessment from a mere outcome metric into a dynamic tool that motivates learners and refines instructional strategies, ultimately driving mutual growth in both teaching and learning.

## **4. Challenges and future development directions**

### **4.1. Technical adaptation and software development issues**

Music education in higher education institutions involves complex technical scenarios such as audio signal processing and automated multi-part score recognition and generation. These challenges demand enhanced adaptability for AI-assisted teaching tools. While existing AI software performs well in general domains, specialized applications for music education—such as real-time harmonic analysis, performance technique evaluation, and personalized error correction feedback—require further optimization and customized development to improve usability and accuracy in professional teaching environments.

### **4.2. Requirements for enhancing teachers' professional competence**

As the core of instructional implementation, teachers must not only master the basic operation skills of AI-assisted tools but also understand the design logic and practical approaches of blended learning. Without corresponding technical integration and instructional design capabilities, educators will struggle to fully leverage AI's potential advantages in classroom interaction, learning diagnostics, and personalized support. Therefore, systematic teacher training, continuous professional development support, and collaborative case-building have become key measures to promote the deep integration of AI and music education.

### **4.3. Transformation of students' learning habits and cognitive strategies**

While AI-assisted tools can enhance learning efficiency, some students remain accustomed to traditional face-to-face

teaching methods and struggle to adapt to new tools like online learning platforms and smart practice systems. These students need to gradually adjust their learning strategies, strengthen self-directed learning and time management skills. Schools and teachers should provide step-by-step guidance and support to help students successfully transition from passive learning to human-machine collaborative learning.

#### 4.4. Data security and privacy protection

During the implementation of AI-assisted teaching systems, students' learning behavior data, practice records, and academic performance information will be continuously collected and analyzed. The use of such data must strictly comply with national and educational industry regulations, with a clear data governance framework established. This includes permission controls, anonymization measures, and transparency protocols to ensure all educational data is used legally, securely, and credibly, thereby safeguarding the privacy rights of both students and teachers.

### 5. Conclusion

From a blended learning perspective, AI technology demonstrates significant application value in university music education. Through intelligent resource recommendation, personalized tutoring, teaching data analysis, and the establishment of an intelligent evaluation system, it can enhance both the quality of music classroom instruction and the learning experience. In the future, universities should deepen the integration of AI technology with blended learning, improve supporting systems and teacher professional development mechanisms, and drive innovation and upgrading in music education.

### Disclosure statement

The author declares no conflict of interest.

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