Exploration and Practice of Curriculum Reform in College Music Education Empowered by AI

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Abstract: With the rapid development of artificial intelligence technology, college music education is undergoing unprecedented changes. Against the background of AI technology empowering music education, this paper explores the innovative paths and practical modes of college music curriculum reform. By analyzing the current status of the integration of AI technology and music education, the research is carried out from four dimensions: curriculum system reconstruction, teaching mode innovation, faculty team building, and evaluation mechanism reform. Combined with typical cases, a set of systematic reform plans is proposed. The research shows that AI technology can effectively improve the personalization level, creativity, and efficiency of music teaching, providing strong support for cultivating compound music talents adapting to the digital era.

Keywords: Artificial Intelligence; Music Education; Curriculum Reform; Teaching Mode; Educational Informatization

In the context of the global digital wave, artificial intelligence technology is permeating various fields with unprecedented depth and breadth. As an important part of traditional art education, music education is also facing enormous opportunities and challenges. The 2019 *Beijing Consensus - Artificial Intelligence and Education* proposed the need to promote the in-depth integration of AI and education, and promote educational equity and personalized learning. At the same time, the Ministry of Education emphasized "intelligent technology empowering education and teaching" in the *Education Informatization 2.0 Action Plan*, requiring exploration of the practical path of AI in art education. These policies have provided a broad space for the development of AI technology in primary and secondary school music classrooms. Artificial intelligence can not only learn and imitate a large number of artistic works and generate new artistic creations, but also provide new technical tools and teaching concepts for music education. As the main position for cultivating music talents, colleges and universities urgently need to respond to the changes of the times and explore the curriculum reform path for the in-depth integration of AI technology and music education.

Based on the practical experience of AI technology application in current college music education, this paper systematically discusses the strategies, paths and effects of music education curriculum reform under AI empowerment, in order to provide reference for relevant colleges and universities, promote the digital transformation and upgrading of music education, and cultivate compound music talents with both artistic literacy and digital literacy.

1.Reconstruction of Music Curriculum System Empowered by AI

The traditional music discipline curriculum system is mostly centered on music theory and performance skills, lacking the systematic integration of scientific and technological means. To meet the needs of the digital era, colleges and universities need to fundamentally reconstruct the curriculum system, organically integrating AI technology with music art.

1.1 Modular Curriculum Design

Some leading institutions have begun to build a "technology + music" characteristic curriculum system including four modules: general education foundation, algorithm principles, cutting-edge expansion, and practical training. The general education foundation module mainly helps students understand the development and application of AI in the music field through case teaching and on-site demonstrations, redefining students' cognition

of music creation, performance and aesthetics. The algorithm principle module focuses on guiding students to understand the general education foundation and algorithm principles of artificial intelligence, including number system conversion, logical thinking and other contents into the study plan to help students consolidate the computing foundation. The cutting-edge expansion module adds innovative contents such as digital music production, artificial intelligence composition, music information retrieval, virtual reality (VR) music creation, and incorporates programming, audio engineering, data science and other skills into the compulsory or elective system. The practical training module sets up music work creation links in classroom teaching, allowing students to create music with different themes in combination with various AI music production platforms, so as to cultivate students' music literacy and innovation ability.

1.2 Integration of Localization and Digitalization

The School of Music and Dance of Xihua University proposed a reform plan of "rooted in the local, embracing technology", incorporating local music resources into the teaching system. The university, in conjunction with folklore scholars, has established a database of intangible cultural heritage music in western Sichuan. In the music form analysis course, it analyzes the structural characteristics of music, and in the orchestration course, it tries to reconstruct the Chuanjiang Haozi (the labor songs sung by boatmen on the Chuanjiang River) with modern techniques. This reform not only broadens students' creative vision, but also strengthens their cultural identity. In recent years, many works created by students of the university have won awards at all levels. Among them, the mixed chorus *Yangjiao Huakai* (Azalea Blossoms) won the Excellent Work Award of the Golden Bell Award; the song *Yangbian Cema Zhuimeng Mang* (Riding a Horse to Chase Dreams) was successfully shortlisted in the second phase of the "Chinese Dream" new song exhibition.

2.Innovation of Teaching Mode Driven by AI

AI technology has not only changed the curriculum content, but also profoundly affected the methods of music teaching, transforming from the traditional one-to-many teaching and one-to-one guidance to personalized, scene-based and interactive teaching modes.

2.1 Personalized Learning Paths

Intelligent teaching systems based on AI technology can provide customized guidance through big data analysis of students' learning trajectories. Take the School of Music of Shanghai Normal University as an example. The school has developed an "intelligent composition teaching platform", which analyzes the harmonic logic in students' homework through algorithms and generates personalized learning suggestions in real time, enabling teachers to focus on creative guidance. Since the platform was launched 3 years ago, the efficiency of students' harmonic homework completion has increased by 40%, the integrity of creation has increased by 35%, the technical error rate of students' works has decreased by 52%, and the originality score has increased by 28%. This personalized learning model effectively solves the problem of difficult individualized teaching in traditional music teaching, allowing each student to develop according to their own rhythm and characteristics.

The Yinzhuoer AI piano practicing machine developed by Yangzhou Lehe Data Company realizes the integration of recording, archiving and analysis through embedded chips, and can real-time analyze performance skills, including key indicators such as rhythm, dynamics and timbre. The device has successfully upgraded traditional musical instruments such as guzheng, guqin and piano into intelligent terminals, realizing innovative functions such as remote supervision and intelligent evaluation. This intelligent auxiliary equipment provides students with immediate feedback and targeted training suggestions, greatly improving the practice efficiency.

2.2 Scene-Based Teaching Mode

The reconstruction of music art courses under the background of modern science and technology needs to pay attention to the application of scene teaching mode. Teachers can enhance the intuitive feeling of music art courses

through multimedia, digital technology, virtual reality and other technologies, so as to improve students' aesthetic ability of music works and stimulate students' imagination and creativity in music.

The "virtual orchestra" system introduced by the School of Music and Dance of Xihua University allows classroom practice to break through hardware limitations, helping students try complex orchestration without relying on a physical orchestra, effectively lowering the threshold of composition, and enabling every student to become a "conductor and composer" of a symphony orchestra. The application of this virtual reality technology creates teaching scenarios that were difficult to achieve in the past, providing students with an immersive learning experience.

The China Conservatory of Music innovatively adopted the scene-based teaching mode in the AI general education course, providing students with an immersive learning experience through the creation of a "human-machine collaborative music creation" project.

The school has set up two creation scenarios: Creative workshop scenario: students input picture descriptions and emotional instructions to guide AI to generate music motives and atmosphere fragments, reducing the threshold of creation and stimulating innovative thinking. Producer laboratory scenario: students play the role of music producers, using professional knowledge and aesthetic ability to conduct refined editing and polishing of AI-generated materials, simulating the modern music industry creation process.

This interdisciplinary collaboration model has achieved remarkable results. The "Dawn Stars" team composed of 14 students from different majors gave full play to their respective professional advantages, repeatedly adjusted the AI output, and finally the created works won the first prize in the competition due to strong artistry and mature technology. Professor Fu Xiaodong of the university pointed out: "AI is a tool, but it cannot replace human productivity." This model has successfully cultivated students' ability to control technology rather than follow technology, effectively improving students' artistic expression and innovative thinking. The college plans to further integrate artificial intelligence with professional courses such as music theory and performance, and design more rich scene-based teaching activities.

3.Reconstruction of Faculty Structure and Ability

The in-depth integration of AI technology and music education puts forward new requirements for the ability structure of teachers. Traditional music teachers need to master the basic principles and application skills of AI technology, realizing the role transformation from pure art instructors to guides for the integration of science and technology and art.

3.1 Transformation of Teachers' Roles and Ability Improvement

In the teaching environment empowered by AI, the role of teachers is changing from "knowledge transmitters" to "learning guides" and "creativity stimulators". Professor Shen Lin of Shanghai Normal University pointed out: "AI is not to replace teachers, but to empower teaching, helping teachers focus more on aesthetic guidance and creativity cultivation". This requires music teachers to not only master professional skills, but also have certain technical literacy and interdisciplinary teaching ability.

To meet this challenge, various institutions have carried out teacher training programs. Some institutions have implemented the "project of improving digital skills and teaching practice of music teachers", building a comprehensive training system covering daily teaching modes, professional discipline systems, music teaching methods, professional skills of music discipline, etc., promoting the change of teaching and learning methods of music discipline, and improving the teaching innovation ability of music teachers.

3.2 Interdisciplinary Team Building

AI-empowered music education requires professional knowledge in music, computer, engineering and other fields, so interdisciplinary collaboration has become an inevitable choice. The School of Music and Dance of Xihua

University has built a teaching team with both theoretical depth and practical experience through the way of "expert leadership and team collaboration". Aiming at the pain point that young teachers "are capable of creation but not good at teaching", the college launched a "dual-track system" training plan. On the one hand, it uses the rich teaching experience of expert teachers to establish a teacher assistance mechanism through the "mentorship" method; on the other hand, it sets up a "creation-teaching transformation fund" to encourage teachers to participate in music creation, academic research and social services.

In addition, adhering to open education, it has established inter-school cooperation relations with top music colleges in many countries and regions, recruited talents from home and abroad as part-time professors in music discipline, integrated excellent social teaching resources, enriched the college music teaching staff, and provided talent guarantee for the in-depth integration of music and science and technology. This teacher construction strategy combining "inviting in" and "going out" has effectively promoted the integration and innovation of interdisciplinary knowledge.

4.Evaluation System and Sustainable Development Mechanism

AI-empowered music education not only needs to pay attention to the teaching process, but also needs to establish an evaluation mechanism and sustainable development system adapted to it to ensure the sustainability and scalability of reform results.

4.1 Intelligent Evaluation System

Traditional music teaching evaluation is mostly based on subjective evaluation and result evaluation, lacking objective standards and process evaluation. The application of AI technology makes multi-dimensional, accurate and formative evaluation possible. By establishing a multi-dimensional evaluation model, AI software is used to score students' music works from multiple dimensions such as lyrics, music style, creativity, and accuracy of knowledge points, and put forward improvement suggestions. This evaluation method not only pays attention to students' understanding of music knowledge, but also examines the technical realization, artistic innovation, social value and other factors of students' music works, which can comprehensively reflect students' comprehensive ability.

The "Lehui Xinghe" AI-empowered immersive music creation education platform developed by the School of Software of East China University of Technology has achieved remarkable results in pilot schools in urban and rural areas. Data shows that after the system was put into use, the participation in music classes increased by 120%, and the teaching efficiency of teachers increased by 30%. This platform has also successfully promoted rural schools to carry out remote art collaboration courses, breaking geographical restrictions and allowing children in remote areas to enjoy high-quality music education resources.

4.2 Industry-University-Research Collaborative Ecology

The sustainable development of AI-empowered music education needs to establish an innovative ecology of industry-university-research collaboration. Some colleges and universities have begun to build interdisciplinary research platforms, integrating resources from musicology, computer science, mechanical engineering and other disciplines, building comprehensive laboratories covering technical modules such as acoustic experiments, motion capture, and virtual reality, focusing on cutting-edge directions such as music emotion computing, intelligent composition algorithms, and music brain-computer interfaces, and establishing a full-chain research system of "theoretical breakthrough - technical research and development - artistic innovation".

Yangzhou Lehe Data Information Technology Jiangsu Co., Ltd. has cooperated with traditional musical instrument manufacturers to realize the intelligent upgrading of musical instruments at a lower cost, creating a digital intelligent folk music classroom, and injecting new momentum into the inheritance of traditional music with technology. With the maturity of intelligent music technology, future music learning will be more personalized and interactive, and everyone can easily enter the music palace with the help of technology. This deep integration of

industry and education provides technical support and practical scenarios for AI music education.

In addition, strengthening international cooperation is also an important way to promote the development of AI music education. Through exchanges and cooperation with top international art colleges and technology enterprises, student exchange programs and short-term study tours are carried out to help students learn international cutting-edge art and technology knowledge. There are plans to select teachers and students to participate in international music academic exchanges, publish research results and display music works on the international stage, learn from the international cutting-edge experience in music education talent training, and enhance the international popularity and influence of Chinese music discipline.

5.Conclusion

AI technology empowering college music education is an inevitable trend of the times and an inherent requirement for the reform and innovation of music education itself. This paper discusses the reform paths and practical strategies of college music education under AI empowerment from four dimensions: curriculum system, teaching mode, faculty team and evaluation mechanism, providing a reference framework and cases for relevant colleges and universities.

Research shows that the application of AI technology can effectively solve the pain points in traditional music education and improve the personalization, interactivity and creativity of teaching. Through intelligent teaching systems, virtual scene construction and data analysis technology, students can obtain richer and more efficient learning experiences, while teachers can be liberated from repetitive work and focus on the essence of art and creative guidance. In addition, the integration of AI technology and music education helps to expand students' interdisciplinary thinking and innovation ability, and cultivate compound art talents adapting to the digital era.

However, AI-empowered music education still faces many challenges. On the one hand, the balance between technical tools and the essence of art education needs to be carefully grasped. Technical convenience may be abused, for example, students rely on AI to complete homework. Teachers need to take the lead in mastering the use and identification ability of AI tools and guide students to use technology reasonably. On the other hand, the application of AI technology cannot be separated from the educational original intention of art education, and should be used as an auxiliary tool rather than replacing emotion and creativity.

In the future, AI music education will show the following development trends: first, the technical application will be more mature, evolving from auxiliary teaching to collaborative creation; second, interdisciplinary integration will be deeper, forming a knowledge system of in-depth integration of music and technology; third, the educational ecology will be more open, building an innovative pattern of collaborative education among schools, enterprises and society; fourth, personalized learning will be more accurate, realizing individualized teaching for each student.

AI-empowered college music education is a systematic project that requires the joint participation and efforts of educators, technical experts, industry and all sectors of society. Only by adhering to the principles of taking education as the center, technology as the means, and art as the ontology, can we promote the innovative development of music education in the digital era, cultivate more excellent talents with both artistic accomplishment and scientific and technological literacy, and make greater contributions to the prosperity and development of socialist culture.

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