

# Research on the Personalized Teaching of Music Education Driven by Artificial Intelligence

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## ABSTRACT

The application of artificial intelligence in music education has opened up a new education and teaching model, which not only provides teachers and students with new learning tools and resources, but also makes the personalized music teaching activities be developed. This paper will explore the implementation path of personalized teaching in music education driven by artificial intelligence, in order to provide certain references for music teachers to use artificial intelligence to carry out personalized teaching, and provide support for the further improvement of the music talent training quality and the better development of music education.

## KEYWORDS

artificial intelligence; music education; personalized teaching

In traditional music teaching, students can come into contact with limited teaching resources, which limits the opportunities for students to independently explore and practice music, and cannot meet the personalized learning needs of students<sup>[1]</sup>. With the powerful functional advantages, artificial intelligence can not only provide students with customized learning plans and resources to meet their individual needs, but also track students' learning behaviors and provide them with more comprehensive guidance, which is beneficial to stimulate students' creative inspiration and enthusiasm, and improve their comprehensive music accomplishment.

## 1 Application of Artificial Intelligence in Personalized Teaching of Music Education

### 1.1 Design of Individualized Teaching Activities

The application of artificial intelligence in music education provides support for teachers to carry out personalized teaching activities. Before the beginning of music teaching activities, teachers can use artificial intelligence to collect students' learning data that is reference for them to make teaching plans. For example, by collecting the practice data of students in the last class, teachers can grasp the learning situation of students and judge the teaching focus of this class, so as to provide targeted guidance for students. In classroom teaching, intelligent digital teaching equipment based on artificial intelligence can also track and record students' classroom learning and transmit it to teachers in the form of data, so as to help teachers accurately grasp students' classroom learning and further adjust teaching content in a targeted manner<sup>[2]</sup>. In addition, the use of artificial intelligence can also enrich the form and content of music classroom teaching, and broaden the music learning space for students, so as to influence students through diversified knowledge and culture in the classroom, constantly improve their comprehensive quality, and meet their personalized learning needs. After class, the intelligent teaching platform can also provide targeted exercise programs according to different basic levels of students, help teachers design personalized music homework, push assistant learning materials for students, strengthen the management of students' daily teaching activities, and so on, so as to promote the realization of personalized music teaching in colleges and universities.

### 1.2 Build an Intelligent Learning Platform

Music teachers can use artificial intelligence to build an intelligent learning platform, which is mainly reflected in three aspects. First of all, the intelligent learning platform based on artificial intelligence can automatically complete the collection, retrieval and classification of massive music learning resources, so that students only need to input keywords to obtain the desired music learning materials. Secondly, this intelligent teaching platform can comprehensively collect students' platform learning data such as learning behavior, historical performance, personality preferences, etc., and draw personal portraits, so as to help students understand their strengths and weaknesses in music learning and match them with targeted teaching programs. For example, in view of the lack of basic knowledge of music theory and lack of instrument playing skills of some students, targeted solutions are given to students to help students strengthen the strengths and make up for the weaknesses, improve the efficiency of music teaching, and promote the comprehensive

and healthy development of students<sup>[3]</sup>. Finally, this intelligent learning platform can meet the interactive needs of students. This platform can build a virtual music learning scene for students and give students a richer learning experience, so as to further stimulate their desire for in-depth learning and give them rich creative inspiration.

### 1.3 Intelligent-aided Music Creation

Music is a creative art, and the application of artificial intelligence makes music creation easier and effectively meets the personalized development needs of students.

First of all, the assistant composition platform based on artificial intelligence can use the machine learning algorithm in artificial intelligence to analyze and deconstruct massive music works, and classify them according to their characteristics, so that students can find creative inspiration according to their actual needs. When students use the platform to create music works, the platform can provide students with targeted opinions according to students' search habits, personal preferences and creation needs, and help students adjust the problems in their music creation in real time, so as to improve the creation efficiency of students' music works.

Moreover, the music works platform based on artificial intelligence effectively lowers the threshold of music creation. In the past, it was difficult for students who just entered college to make music due to the lack of basic knowledge. However, the artificial intelligent-aided creation platform can effectively reduce the threshold for students to create music works. Students only need to enter the creation requirements, artificial intelligence can automatically generate a piece of music. Besides, in the process of students' music creation, the editing and correction functions of artificial intelligence can help students make flexible adjustments, so that students can directly interact with the generated music works, thus greatly improving the creative enthusiasm of students and meeting the personalized development needs of students.

Artificial intelligence can also be used as an assistant tool in instrumental teaching. Taking the piano teaching as an example, the artificial intelligence platform can use the sensor device connected to the piano to capture the details of students' performance, such as button strength, hand gestures, rhythm changes, etc., to help teachers grasp students' performance in a more comprehensive way, so as to provide targeted guidance for students. At the same time, with the support of artificial intelligence, the "digital piano" can accurately analyze students' practice duration, practice intensity and practice effect, and recommend appropriate practice tracks to students through the intelligent platform, so as to improve students' certain abilities in a targeted manner<sup>[4]</sup>. In addition, the superposition of artificial intelligence, virtual reality and augmented reality can also build a virtual music scene for students, so that students can creatively integrate other different instruments and music fragments in piano practice, thus making music teaching more vivid and greatly improving students' creative enthusiasm.

### 1.4 Dynamic Feedback and Tracking

Artificial intelligence can also achieve the dynamic assessment and tracking of students' learning behavior, and provide feedback directly to teachers and students through the system, so as to help students master skills more effectively and promote the optimization of learning outcomes. When students use the intelligent learning platform to learn, the system will conduct long-term dynamic tracking of students' learning data and performance data, and understand students' learning status through continuous comparison and correction of the data that includes students' strengths, weaknesses, habits, levels, development and so on. In addition to the longitudinal personal comparison, the artificial intelligence system can also compare the data of students horizontally, so that teachers can accurately evaluate the level of the student in the class and the comprehensive teaching quality to provide necessary references for the next teaching plan. In terms of feedback, the feedback system built by artificial intelligence system is dynamic rather than periodic. This data-driven feedback method can make the teaching feedback more targeted, and also provide a basis for teachers to optimize resource allocation and adjust classroom teaching activities.

## 2 Key Points for Personalized Teaching of Music Education Driven by Artificial Intelligence

The development of artificial intelligence has provided important support for the realization of personalized teaching in music education. However, in the process of education and teaching, it is still necessary to pay attention to many aspects.

### 2.1 Strengthen Data Security Management and Break Down the "Data Barrier"

Colleges and universities should strengthen the management of educational data to ensure that students' data will not be tampered with and used, which may affect the accuracy of personalized teaching. First, universities should

strengthen the application of data encryption technology in the process of their education data transmission, and use blockchain and other technologies to continuously improve the transparency and traceability of data to prevent the leakage of students' information. Second, in daily teaching, teachers should strengthen the maintenance of the artificial intelligence teaching system, and regularly update and test the music teaching equipment and software, so that teachers and students can make full use of the artificial intelligence teaching system to carry out education and teaching activities. Third, there is a need to strengthen the sharing of data and information. It is necessary to take students as the center, and break the data barrier between various disciplines of music major and between school and enterprise cooperation, so as to use the artificial intelligence teaching system to draw accurate "personal portraits" for students, and constantly improve the pertinence and effectiveness of music education and teaching activities<sup>[5]</sup>. Fourth, colleges and universities should strengthen the full coverage of artificial intelligence in education and teaching scenes, focus on strengthening the construction of campus ecology, cultivate students' digital education concept, and promote students to have the positive interaction with artificial intelligence, so as to provide enough data support for colleges and universities to continuously optimize teaching programs.

## 2.2 Enhance the Teaching Experience and Promote Deep Learning

Music teaching is boring, and students often find it difficult to maintain their enthusiasm for learning for a long time. Therefore, music teachers should make full use of the artificial intelligence teaching system to continuously improve students' classroom experience, stimulate students' learning interest, and gradually guide students to develop the habit of independent learning to promote the realization of personalized learning. For example, music teachers can take the initiative to "stack" artificial intelligence, virtual reality, augmented reality, etc., to build a "realistic music classroom" for students to constantly enrich their music experience and stimulate their creative inspiration. Moreover, teachers can use the artificial intelligence teaching platform to give students more practical opportunities and encourage students to try to use a variety of musical instruments to create, so as to gradually master more music creation skills and improve music creation ability.

## 2.3 Build a New Type of Teacher-Student Relationship and Strengthen the Guidance and Supervision for Students

The application of artificial intelligence in music education effectively broadens the teaching space of music education and meets the personalized learning needs of students. However, artificial intelligence is not omnipotent, and teachers still have an irreplaceable role in music teaching. Therefore, on the one hand, teachers should take the initiative to use the artificial intelligence teaching platform to strengthen the interaction with students, break the previous teaching mode of information infusion and knowledge imparting, and give full play to their own infectious effect to cultivate students' good music quality. On the other hand, music teachers should face the advantages and disadvantages of artificial intelligence, and avoid the decline of comprehensive ability due to excessive reliance on artificial intelligence, so as to promote their own healthy development.

## 3 Conclusion

To sum up, compared with the Internet and online learning platforms, artificial intelligence has a more flexible application, a richer experience and a more intelligent form, and is more compatible with the goal of smart teaching in the new era. Therefore, colleges and universities and music teachers should recognize the importance of artificial intelligence in music teaching, boldly explore the application of artificial intelligence in music teaching, and build an intelligent music teaching system to meet the personalized development needs of students.

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