

Research on the Fusion Application of Music Technology and Music Education under the Background of Artificial Intelligence

Qian Zhang^{1, a}, Huizi Li^{2, b}, Chao Zhang^{2, c, *}

¹Communication University of China, Beijing, China

²School of Music and Recording Arts, Communication University of China, Beijing, China

^acuczq@cuc.edu.cn, ^bhuizikalian@163.com, ^c*music-industry@cuc.edu.cn

Abstract

The fusion application of music technology and music education in the context of artificial intelligence is a popular research field that has become the focus of many scholars' attention. Music education in art education has always been closely connected with the development of aesthetic education in China. How to construct and use information technology to optimize education Resources, expand the coverage of high-quality resources, so as to establish an effective high-quality educational resource mechanism, deepen people's new understanding of the integration of technology and music education, this article will build a framework for integration research from a macro perspective, and discuss artificial intelligence technology in music education Media role.

Keywords

Artificial Intelligence; Music Education; Music; Technology; High-quality Educational Resources.

1. Introduction

Since the Higher Schools Artificial Intelligence Innovation Action Plan issued by the Ministry of Education, the integration of artificial intelligence and music education has entered a stage of rapid development. Also, with the deepening of the comprehensive reform in the field of education, the education department has made comprehensive Arrangements, and at the same time, it has listed educational informatization as an important content of the comprehensive reform in the field of education. The current application of artificial intelligence in music technology and music education has shown an explosive growth, and the active attempts and breakthrough progress in music education are even more amazing. The rapid development of contemporary scientific and technological means has had a huge impact on music education and teaching. It has not only brought a technical breakthrough in the development of music education and teaching, but also played an important role in the innovation of teaching modes and educational concepts. The promotion effect has brought positive changes to the establishment of new concepts of modern music education, the innovation of teaching methods and teaching methods.

Relying on their own music education teaching experience, the authors reviewed the current problems in music education, and combined with the evolution analysis of artificial intelligence technology, combed the integration process and development prospects of music education and artificial intelligence technology. In improving learning efficiency, through "intelligence" [Jia Jiyou. Artificial Intelligence empowers education and learning [J]. Distance Education Journal, 2018, (1): 39-47] upgrade educational cognitive ability, so that the educated becomes more smart. In view of this, a research framework of taking the fusion panorama as the body, the fusion front as the line, and the fusion landing as the point" has been initially formed.

Specifically, 'integrating the panorama as a body' will analyze the development overview of the integration process of music global education and artificial intelligence global technology from a macro perspective, and 'taking the fusion frontier as the line' will focus on the cutting-edge issues of music education and artificial intelligence of hotspot technologies. From the perspective of analyzing the context of the development of the fusion process, 'taking fusion landing as the point' will focus on analyzing the reality of fusion from the perspective of promoting integration landing and enhancing social benefits.

2. The Connotation of Educational Artificial Intelligence

In educational artificial intelligence, the teaching model, domain knowledge model and learner model are its core. The teaching model mainly includes teaching professional knowledge, skills and effective methods. The domain knowledge model contains the professional knowledge system of students and subjects. The learner model shows the interaction between the computer and the learner. Through the student's learning activities and emotional states, the student's learning situation is understood. The learner model can feedback its learning situation according to the learning behavior of the specific learner, and the teaching model and domain knowledge model can infer the learner's progress through the feedback of the learner model, adjust the knowledge system and teaching methods in the model to suit the learner's learning, and then form a dynamic system of mutual circulation, making the entire model system more complete and richer.

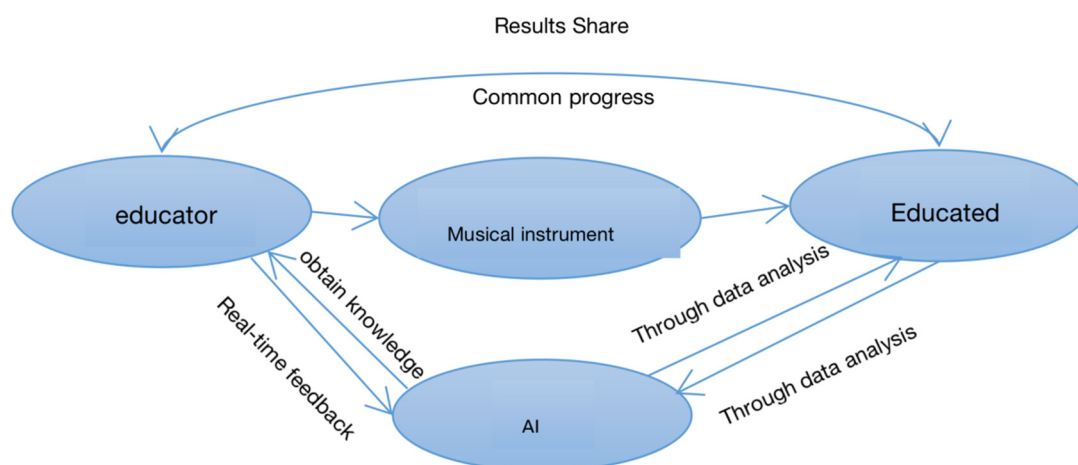


Fig 1. Artificial intelligence education system

In the era of rapid technological change, the change of smart technology is more rapid. It takes a certain period of time for the cultivation of personal energy alone, and it is necessary to establish a certain cognition, concept, and cultivation of reversal of identity, understanding, perception, etc. Therefore, the positioning of educational artificial intelligence should be more clear. Compared with advanced technology, educated people are in a relatively lagging state of development, and the application of intelligent technology should conform to the overall law of human education. To some extent, artificial intelligence is a "double-edged sword." If its accelerated application to educated people, there will be certain behaviors that violate the ethical principles, thus limiting the development of intelligent technology. The authors believe that the technology of educational artificial intelligence should play two core roles. On the one hand, it is to improve the efficiency of repetitive learning, and to shorten the unnecessary time wasted by educators in the learning process in an auxiliary way; On the one hand, it is better to develop the talents of learners, mainly guided, and integrated into the traditional teaching of Tao. Both educators and educated people need a certain amount of time and cycle to improve their

qualities. Through continuous application of technology to achieve the purpose of adapting to the new teaching model, educational intelligence technology should become a new way to improve efficiency, rather than violate education The trajectory of the learner's development.

3. The Research Framework in the Integration of Music Education and Artificial Intelligence Technology

Artificial intelligence education is to make people master artificial intelligence technology through education. While educational artificial intelligence is to use artificial intelligence technology to better achieve the purpose of education. Based on the current problems in music education, combined with the evolution analysis of artificial intelligence technology, the following research framework is summarized. At present, there is limited understanding of artificial intelligence, so many people have unprecedented anxiety and confusion. Therefore, we must redefine how artificial intelligence-based music technology assists music education, and recognize the value and future development of education from a macro perspective Direction. It does not form what Jerry Kaplan said in *The Age of Artificial Intelligence* to take over human life and work in a comprehensive way. [Jerry Kaplan. Translated by Li Pan. *The era of artificial intelligence: the future of wealth, manpower and thinking under the symbiosis of man and machine* [M] Hangzhou: Zhejiang People's Publishing House, 2017]

The use of artificial intelligence in music education explores more possibilities, looks at many excellent cases in such fields, expands the test objects and obtains more rational and objective results through comparative analysis. The first part of the framework is "Fusion of Panorama", which collects the specific application of the currently popular artificial intelligence algorithms in music learning. The research found that there are two main categories of popular intelligent recognition systems related to music education: the first category is pitch recognition algorithms; the second category is rhythm recognition. The two most common algorithms are the most used in complicated applications. The related software that can be seen at present is to provide basic learning content for beginners, but the accuracy still needs to be improved; the second part of the framework' Taking the fusion frontier as the line is to analyze how to apply such artificial intelligence algorithms to more teaching fields. Through the current algorithm research, it is found that if the above two types of algorithms are analyzed through cloud data to record the learning quality of learners, Give rational and objective evaluations, in order to provide the basic performance or singing problems that can be solved, and provide the most suitable learning content through artificial intelligence. Not only can such artificial intelligence technology be used in children's learning stage, but in the learning process of adult learning and other musical instruments, almost all textbooks can be solved with the same technical point, thereby changing the most common basic problems in learning. . "Focusing on the ground" is the process of using Internet media technology to improve teaching conditions, improve teaching quality, and optimize high-quality resources. To solve the problem of lack of resources for excellent music teachers in my country through landing methods, in a true sense, the integration of music technology and music education through the power of science and technology. Reasonably adjust the interests of business and public education, achieve the goal of optimizing educational resources, improve the application ratio and transparency of artificial intelligence in various learning environments, and ensure that artificial intelligence achieves a real boost in music education.

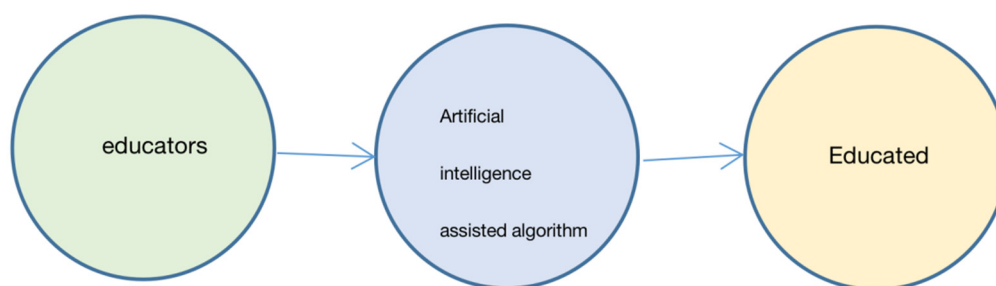


Fig 2. Model of AI-assisted Algorithm in Music Education System

4. The Media Role of Artificial Intelligence Technology in Music Education

Artificial intelligence technology has played a media role in music education, not a substitute. Its media function is the process of transferring the transfer from A to B. In short, it is to transfer the content of music education to the educated learners. The traditional music learning model is to directly participate in music courses and learn through the guidance of teachers. This kind of teaching model is the basic model for learning music. Music educator Lucy Green once advocated that we use our ears to "replicate music", to break away from teachers' guidance, arouse the desire to learn, and increase the internal drive to promote music learning. This has been recognized by many music lovers. This learning method is not only suitable for amateur learners, but also provides a more efficient way and a broader learning field for professional performance learners, which in a sense subverts the traditional education. mode. Based on this, in the process of copying music with ears, whether the judgment is correct or not is left to the learner himself. In the learning process in the context of artificial intelligence, learners are not passively fused into learning, but the process of active learning. In the process of learning, we are active participants. The technology of artificial intelligence allows us to achieve another process of receiving. In 2017, Tang Yewei and others proposed the "based on artificial intelligence + STEM" interdisciplinary integration model, which is based on an active way to promote interdisciplinary integration. In music education, the subject of education is human. What we need is to solve the long learning process through music technology and artificial intelligence technology, and shorten the time cost on the problems that can be solved quickly. For example, in the process of learning to play musical instruments, the grasp of basic knowledge is more accurate and efficient, and more time is used to enhance the artistic quality of music, rather than relying on artificial intelligence to help us realize the process that originally required self-cognition. Artificial intelligence technology is to escort us for our better music education.

5. Thinking and Suggestion

At present, the artificial intelligence algorithm technology we use is basically stuck in the recognition of a specific item. The more complex AI intelligent composition is gradually mature, although there are many papers that point out whether artificial intelligence technology can replace the human brain. A lot of anxiety, but the authors believe that we must grasp the direction of artificial intelligence. Its role is to allow us to better adjust our learning methods, improve the entire learning system, and fundamentally solve some of the inefficient Basic problems make our learning more targeted. Under the background of artificial intelligence, the real beneficiaries of music technology and music education are teachers and students. They follow the natural growth law of students' learning, maintain consciousness and sober consciousness, and avoid the artificial intelligence technology overdue to degrade their learning

ability. It is necessary to make reasonable use of high-quality educational resources, to apply technology in enhancing their learning ability to explore more possibilities, and to reduce the so-called ethical risks of artificial intelligence. We can clearly predict the possibility of technological development. Mastering the more media role of human artificial intelligence allows us to better enjoy the popularization of high-quality educational resources.

The impact of artificial intelligence on the education field will be subversive. People need to adjust their learning attitudes to keep up with the changes in learning methods brought about by technology. Educated people need to update the learning methods and cognitive paradigms to build the only learning model before; educators need to update the educational concepts and theoretical frameworks to interpret the connotation and value of new rainy education under intelligent technology and reshape The identities between teachers, students and artificial intelligence technologies respond to the changes in information technology by practicing a modern education path. The extensive use of informatization is to allow us to update a series of questions on how to learn, how to learn, and how to teach. We need to consider the teaching content, teaching objectives and the best presentation method from the perspective of informatization, to understand the meaning of education informatization in a more specific way, and the order of knowledge is reconstructed. In learning, what we need is to take an efficient learning path, save the time used to improve thinking patterns and self-awareness, and use a more personal perspective to choose a broader development in a more complex and rich world in the future road. The world is becoming an information circle, and human cognition is also gradually updated. We hope that through our own cognition, we can build a learning circle with rich content and value sharing under the leadership of new technologies.

References

- [1] Xi Jinping. Make sure that the key core technologies of artificial intelligence are firmly in your own hands. People's Daily (Overseas Version), 2018-11-01.
- [2] Wu Jun. Intelligent Age. Beijing: CITIC Publishing Group, 2016. 364-365.
- [3] Yuval Heralli. A brief history of the future-from Homo sapiens to Wise God. Beijing CITIC Publishing House, 2017. 286.
- [4] Richard Watson. Intelligent society-how people live, love and think in the future, Beijing CITIC Publishing House, 2017. 179, preface 6.
- [5] Karl Jaspers. What is education. Beijing: Life·Reading·Xinzhi Sanlian Bookstore, 1991. 4.
- [6] Tao Xiping. The future is no longer far away. China Education News, 2018-09-01.
- [7] Li Yanhong. Intelligent Revolution-Meeting the Social, Economic and Cultural Changes in the Age of Artificial Intelligence, Beijing CITIC Publishing House, 2017. 276, 122.
- [8] Luke Dommel. Artificial intelligence: change the world, rebuild the future. Beijing: CITIC Publishing House, 2016. 221, 246.
- [9] Yuval Noah Harari. Homo Deus: A Brief History of Tomorrow. New York: Harper Collins Publishers Inc., 2016. 318-321.
- [10] Nick Bostrom. Super intelligence: Paths,Dangers, Strategies. Oxford: Oxford University Press, 2013. 1.