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Research on the Application of AI-Human Collaborative Composition Creation Models in Teaching

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Abstract: With technological advancements, artificial intelligence technology is also evolving, and the methods of music creation and teaching are gradually changing. In terms of creation, the earliest creations were completed independently by human creators, requiring extensive theoretical support. Meanwhile, the methods of music creation are constantly evolving and diversifying, and the AI collaborative creation model is gradually becoming the mainstream approach to music creation. This article explores four aspects: how AI assists human composition, typical models of collaboration between human composition and AI, the application of AI composition in music education, and the future development direction of AI music generation technology in education, thereby better understanding the role and value of AI in music creation and education. AI is developing rapidly but not yet mature. Technically, AI can effectively help us solve problems in creation and teaching, but there are still some controversies regarding emotional depth and copyright. Therefore, we should avoid relying on AI as much as possible when using AI.

Keywords: Artificial intelligence; Music composition; Music education; AI collaboration; Technology ethics

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1. How AI can assist humans in composing

Music plays an important role in daily life. It is not only a carrier of human emotions but also a medium that helps people express themselves. How to create and accurately express inner feelings and ideas is a challenge faced by every musician. Music creation is a complex and multidimensional process [1], involving artistic expression, technical application, and the comprehensive application of theoretical knowledge. Music is a language, and notes and rhythm are words. By combining the two and adding different instruments and stylistic elements, a complete piece can be created. Artistic expression in music is about conveying the author's feelings and ideas to the listener in this way, allowing them to draw energy or resonance. Creative motivation and sources of inspiration, compositional techniques and theoretical frameworks, and technical tools are all manifestations of creative application. The technical applications in composition are also diverse (such as

advancing, repetition, variation, contrast, imitation, etc.). How to properly and brilliantly arrange rhythm, harmony, and melody in music requires different writing techniques and approaches. Before the advent of AI, creators usually first devised a motivation based on emotional expression needs, cultural heritage awareness, or desire for innovative exploration, then developed and modified it according to emotional changes, then adjusted the rhythm according to style needs, and finally paired it with harmonies that matched the style. This approach basically produced a relatively complete melody. However, since humans are emotional creatures, this approach often suffers from a lack of inspiration. When such situations arise, music creation is also hindered. Now, with the advent of AI, the often exhausted human inspiration has been largely remedied. This not only improves human creative efficiency but also increases the amount of music produced.

The advent of AI has made music creation more convenient. Software like "Sonato," "Udio," and "Suno" are all commonly used AI music creation tools today. These software programs operate similarly: you need to enter the keywords you want for your song on the creation page, such as your desired style, the emotions you want to express, or the theme you have set. The system will automatically generate your customized lyrics and music. However, the level of development varies. For example, the advantage of "Sonato" is that it is completely free and unlimited, allowing you to customize songs with your own lyrics. You can also directly use the teleprompter to generate the works you want, and its generation speed is very fast—you can generate three songs at once. Even better, after the song is generated, you can edit your music—just select the section you want to change and use prompts to modify it. However, this software is still not very mature in Chinese language development, so it may not be able to create smooth Chinese lyrics. The second, "Udio," is more accurate in terms of style, but unfortunately, there are only five free songs per day. Compared to the other two apps, "Suno" has more mature and stable technology and software. It also integrates different languages and musical styles better and can recognize more unique instruments.

2. Typical model of human composition with AI assistance

In recent years, AI music creation technology has developed rapidly and gained some recognition. Many music majors, teachers, and even music enthusiasts who haven't received systematic training have gradually started experimenting with AI for creation. During this process of adjustment and collaboration, humans and AI have also given rise to different creative models under different needs [2].

The first is the creative inspiration mode: AI software analyzes a large number of musical works provided by humans and uses them as references to generate melodic fragments, harmonic progressions, and rhythm patterns to inspire creators. Based on these materials, creators can filter them and then decide whether to modify or reorganize them, ultimately forming a complete musical work. For example, if I need to write a piece in the swing style but my current theoretical level is not sufficient to support this style, I can send sample pieces I found into the system, then have the AI system analyze the rhythm arrangement and harmony combinations, and finally generate the material based on it. This model is common in the early stages of creation, helping creators break through their creative bottlenecks and fixed thinking patterns, thereby achieving the goals and effects of innovation.

The second is the assisted generation mode: This mode is generally suitable for situations where you need to produce works quickly. Creators can input corresponding style parameters (such as genre, tempo, etc.) into the AI system based on their actual needs (mood, style, etc.) to generate complete musical passages [3]. After obtaining the generated content, it is then edited and optimized to adjust details to align with the original

creative intent. For example, the work “Seven Days Lover.” The creator inputs a song related to love into the system, asking the AI to compose a song. The song title should be profound and convey the sweet atmosphere of love. The system then automatically generates this song and gains a large audience on the music platform.

The third is the collaborative enhancement mode: During collaborative creation with AI, it is inevitable to encounter styles that do not align or fail to meet internal expectations. In such cases, you can interact with the AI to adjust parameters in real time so the AI composition system can provide stable feedback and continuously optimize output. This two-way interaction helps foster the formation of musical ideas. This approach to music creation allows creators greater freedom in expressing and creating their works, without being restricted by traditional music creation rules, meaning creators can pursue their unique inner voice more deeply.

The fourth is the technical optimization model: music creation requires high musical literacy and a theoretical foundation, but not every creator can fully master every aspect of knowledge, thus needing the assistance and support of AI systems. In creation, we can use AI to solve technical problems in composition, such as automatically orchestrating a piece when the creator doesn’t know the instrument, helping creators who don’t do post-production audio with mixing and optimizing voice balance, or optimizing the creator’s existing playing techniques. This approach allows creators to focus more on creative expression without being constrained by technical issues, and on the other hand, it can more effectively improve music production efficiency and increase the output of works.

Each model summarized above reflects different focuses of human-machine collaboration, ranging from simple tool assistance to deep creative collaboration. In current music creation practices, these models are often used in combination, with specific applications depending on the creative goals, music genre, and the creator’s work habits. It is worth noting that AI mainly undertakes technical and repetitive tasks in these modes, while emotional expression and artistic decision-making in music remain dominated by humans. Through continuous collaborative creation between humans and AI, the relationship between AI and humans in music creation is becoming increasingly close. The assistance of artificial intelligence has opened new possibilities for music creation. By analyzing vast amounts of music data and generating new musical works based on human needs, it greatly provides human creators with inspiration, creative space, and thinking direction, and better helps them realize their musical dreams.

3. AI and the application of composition in music education

With the gradual development of AI composition software, these tools have been continuously used as auxiliary tools in music teaching. In teaching, AI can analyze large amounts of data and patterns in musical works, then automatically generate specific technical requirements or examples of musical styles based on teachers’ teaching needs, providing students with suitable learning materials [4]. For example, the jazz styles “shuffle” and “swing” are often confused during students’ learning. We can use AI to generate typical rhythm patterns corresponding to these two styles, helping students master and distinguish between them; AI can also help students train and learn scales. Different scales have different harmonic colors. We can use AI to generate accompaniment in corresponding styles and guide students to sing the corresponding scales based on the accompaniment. For example, the difference between blues scales and natural major scales is that they lower three or seven notes and raise four notes. We can use AI to generate a classic blues accompaniment in twelve-bar 4/4 time, and then, guided by the harmony of this accompaniment, lead students to construct and sing the

blues scale to achieve training goals.

In addition to customizing learning materials, the development of AI composition technology can further enable personalized learning [5]. The AI composition system can adjust the overall difficulty of the music (speed, style, harmony, musical structure, etc.) according to students' learning needs, providing practice that better meets practical needs. Such adaptive learning systems can more efficiently improve students' learning outcomes.

AI composition has brought considerable convenience to music education and teaching, but it also faces some problems and challenges. The first issue is that the emergence of AI may cause students to develop psychological barriers, weakening the training of traditional musical skills [6]. Excessive reliance on AI tools may cause students to neglect basic music theory knowledge, making it difficult to improve their musical literacy. Moreover, music is a subject with a biased approach, and AI is a mechanical tool. Therefore, AI-generated music still faces limitations in emotional expression and artistic originality, which is why AI cannot replace human teachers in teaching guidance.

4. AI: The development direction of music generation technology in future education

The emergence and development of AI music have had a certain impact and drive in the field of music creation. The one-click generation feature of AI music has put the pressure of professional creators facing the pressure of being replaced for their professional survival, which has also forced creators to redefine their own value; The basic process of music creation has undergone certain changes; The rapid production feature of AI music makes music copyright issues even more worth considering; Music education began to emphasize creativity rather than simply pursuing technical skills [7]. Although AI music is gradually replacing human creation, there are still obvious limitations, mainly reflected in the fact that most systems tend to be mechanized and fixed, thus lacking true musical understanding capabilities. Although AI-generated content can take many forms, it is not as rich in emotional depth and artistic expression as human composers. The essence of music creation is the output of emotion, spirit, and energy, so AI-generated music often requires human modifications and selection to reach the highest professional standards.

As a new mode of music creation, AI music not only brings challenges but also presents certain opportunities, and the future trends of music creation have also changed to some extent [8]. The model of human-AI collaborative creation will become the mainstream trend, where people only need to motivate AI to advance, or conversely, AI motivates humans to develop it further; AI will take on more repetitive and technical creative tasks, such as harmonic progression and arrangement or instrument arrangement. People don't need to go to great lengths to find references; AI can directly arrange and produce according to the style requirements provided by humans. As creative modes change, the standards for evaluating music are also evolving; In the future, personalized music customization will become more widespread, making music creation more accessible to everyone. People can have AI tailor their music according to their current moods and feelings.

To better collaborate with AI and strengthen the targeted nature of music creation teaching, more professional AI music education systems should be developed in the future [9]. For example, course systems can be divided into three levels: beginner, intermediate, and advanced! Students can learn step by step like a game level. In beginner courses, AI can generate simple melodies and then guide students to analyze and

imitate; in intermediate courses, AI can generate chords for students to select and develop into complete works; in the final advanced stage, AI can assist students in arranging and arranging existing melodies, but the student still leads the creative process; In actual teaching, a teaching model combining AI and human guidance should be established, and long-term tracking of the effectiveness of AI composition education should be conducted [10]. Educators need to regularly assess the boundaries of AI tool usage to ensure that AI tools do not harm the artistic essence of music education while improving teaching efficiency and effectiveness.

5. Summary

The emergence and development of AI music have created new momentum for music creation and education, effectively reducing a large portion of the preparation time, allowing creators to focus more on the music and teachers to concentrate more time and energy on students' learning. In terms of creation, the emergence of AI music technology lowers the threshold for creation, allowing every student to try and participate in creation, bringing new experiences and opportunities that make it easier to enjoy the joy of creation. During teaching, it further improves teaching efficiency, making difficult theories more visible and easy to understand. However, with AI technology, we must remain vigilant and not overly reliant on AI technology; we should have our own ideas to maintain human innovation and creativity.

Disclosure statement

The author declares no conflict of interest.

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