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Research on Creative Practice in Music Education Empowered by AI

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Abstract: This paper reviews the development of AI in music, And introduced three AI products to demonstrate their wide range of applications and innovative capabilities in creation. It explores the transformation of student roles and the value of AI in art education in conjunction with the new art curriculum standards. The paper emphasizes enhancing student skills through creative practice. It also reflects on the challenges and opportunities of integrating technology with art, noting that AI should assist rather than replace human creativity. Looking ahead, this paper underscores the importance of maintaining human creativity at the core amidst the AI wave, providing theoretical support and direction for integrating technology into art education and promoting harmonious coexistence between art and technology. It also emphasizes indirectly that in this process, educators need to continuously explore, making technology a powerful assistant in cultivating students' creativity. Students also need to learn to use AI to cultivate the habit of autonomous learning.

Keywords: AI, Music Education, Creative Practice, Role Transformation.

1. Introduction

In 2023, the emergence of ChatGPT shattered the public's "general" perception of artificial intelligence, sparking widespread discussion and reflection across various industries. One of the most disruptive reflections is whether humanity's future will be replaced by artificial intelligence. Tracing the development of AI, its origins were not a chance occurrence but were rooted in a seminal workshop held in the United States, which brought together leading experts from multiple disciplines, including mathematics, computer science, cognitive psychology, economics, and philosophy. After eight weeks of intensive and profound discussions, ten distinguished scholars collaboratively established a clear and far-reaching definition of AI. The core vision was to create a system based on symbolic reasoning and representation, aiming to simulate and replicate the complex and variable human thought processes. In the ensuing decades, AI technology, like the dawn of a new day, illuminated the ancient and sacred realm of music creation. It not only greatly expanded the creative boundaries for musicians, renewing methods and forms of musical composition and expression, but also injected unprecedented innovation and infinite possibilities into the art of music itself. The rapid development of AI in the music field not only supplements and extends traditional creation models but also offers a profound exploration and reinterpretation of the essence of music, demonstrating the infinite charm and broad prospects of the perfect integration of technology and art. This process not

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only affirms the capabilities of AI technology but also represents a bold expansion of the boundaries of human creativity and imagination.

2. The Development of Music Artificial Intelligence

2.1. Emergence and Initial Exploration: Conceptual Foundations and Early Practice

Since the mid-20th century, when the concept of AI was formally proposed, its potential has rapidly expanded into the broad realm of artistic creation, with music composition becoming one of the early fields of exploration. During this period, AI music composition primarily focused on computer-assisted composition, simulating human musical thought processes through symbolic reasoning and representation systems. In 1956, American composer Lejaren Hiller's creation of the Illiac Suite using the Illiac computer at the University of Illinois marked the first successful application of AI technology in generating a complete musical work, paving the way for AI music composition.[1] Subsequently, the initial development of voice synthesis technology, such as Max Mathews and John Kelly's Daisy Bell, further demonstrated AI's potential in musical expression.

2.2. Technological Advancement and Application Expansion: From Assistance to Innovation

By the 1980s, AI music composition technology experienced rapid development. In 1982, Stanley Kubrick was released as the world's first song entirely sung by a computer, marking an advanced application of AI in the music field. At the same time, the emergence of music notation software like Overture, Sibelius, and Finale significantly enhanced the efficiency and precision of score production, providing robust technical support for music composition. Entering the 21st century, with the proliferation of the internet, AI's application in music platforms such as YouTube and Apple Music became increasingly widespread, improving user experience and driving the intelligent development of features such as music recommendation and volume adjustment.

2.3. Advanced Applications Led by Deep Learning: A Deep Integration of Creativity and Technology

Starting in 2010, the rise of deep learning technology brought revolutionary changes to AI music composition. During this period, AI not only achieved complex music creation, performance, and analysis but also demonstrated unprecedented innovative capabilities. Examples such as Baidu's conversion of famous paintings into music, HiFi House's release of the AI creation assistant "Xiao Hi" album, and Microsoft's Xiaoice mastering lyrics creation and composition abilities highlight AI's deep application and high creativity in the music composition field, marking the entry of AI music composition into a new development stage.

2.4. Technological Maturity and Popularization: Dual Leaps in Research and Application

By 2020, with the continuous maturation and popularization of AI technology, music artificial intelligence has become a hot field in both research and application. The Central Conservatory of Music and Shanghai Conservatory of Music have successively established doctoral programs in music artificial intelligence, marking significant progress in academic research and high-level talent cultivation in this field. Additionally, the leap in application has been more pronounced, with platforms like SUNO AI achieving fully automated music composition and even converting text into musical notes, providing convenient music creation tools for non-professionals and further promoting the popularization and democratization of AI music composition.

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3. Functional Introduction and Comparison of Three Music AI Systems: SUNO AI, Xingzhe AI, and AIVA AI

3.1. Introduction to the Functions of the Three Music AIs

SUNO, as a research-oriented enterprise in the field of artificial intelligence, aims to democratize and popularize music creation, breaking down professional barriers and encouraging more people to engage in music composition. Its innovative model, developed in-house, is capable of independent music creation and can use ChatGPT to generate lyrics, enabling fully automated creation. Since the release of SUNO AI V3, it has been praised by many industry professionals as the "ChatGPT of the music world." Its uniqueness lies in the fact that it does not require users to have professional knowledge or vocabulary in music; ordinary people can also generate the music they desire. The latest V3 model has undergone comprehensive upgrades, supporting the creation of complete 2-minute music tracks and offering a variety of styles, including but not limited to R&B, pop, hip-hop, country, and electronic music, catering to diverse user preferences. Additionally, it supports input and output in over fifty languages, including Chinese, French, Japanese, Russian, and Spanish, achieving truly barrier-free communication in the music field.

AIVA, which stands for Artificial Intelligence Virtual Artist, first debuted on March 26, 2017, and is a product developed by AIVA Technologies specifically for music composition. It is a leader in the field of AI composition. AIVA is the first AI composer to receive international certification. Through its unique learning mechanism, AIVA has studied the works of composers such as Beethoven and Mozart, drawing inspiration and techniques to create music. AIVA AI is capable of composing both classical and contemporary music, and its works are suitable for various scenarios including films, advertisements, and games. Moreover, AIVA AI provides users with a high degree of creative freedom, allowing them to customize harmonies, instrumentation, and other elements according to their needs. Notably, AIVA AI also supports lyric creation in multiple languages, enhancing the integration of music and lyrics and achieving a truly borderless musical experience.

Xingzhe AI, officially known as Chengdu Potential Artificial Intelligence Technology Co., Ltd., offers a comprehensive AI music education platform that integrates interactive AI lyric writing, composition, vocal synthesis, and arrangement functions. The platform aims to assist people in music creation and uncover musical talents and potential through AI technology. Xingzhe AI's music education platform is used in multiple schools, benefiting tens of thousands of teachers and students by providing innovative teaching methods and experiences. Xingzhe AI deeply integrates three dimensions—language, visual, and auditory—to achieve a comprehensive, unified approach to creative innovation and personalized learning. Users can not only use AI technology to create lyrics but also generate unique musical melodies with AI algorithms. Additionally, the platform employs advanced AI vocal performance technology to present music works with more vivid and realistic sounds. Xingzhe AI also offers intelligent evaluation and analysis features to help users accurately grasp the strengths and weaknesses of their music works, providing strong support for subsequent improvements.

3.2. Comparison of the Three Music AIs

When delving into the functions and features of the three music AIs, it becomes evident that their contributions to music creation extend beyond technological innovation to the broadening and deepening of the boundaries of musical art.

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3.2.1. Exquisite Demonstration of Music Creation Capabilities

All three AIs exhibit outstanding music creation abilities. They excel in weaving melodies, constructing harmonies, and controlling rhythms, seamlessly navigating between these elements to produce music that is both complete and emotionally charged. This capability not only reflects a profound understanding of music theory but also highlights the AI's boundless potential in emotional expression and artistic innovation.

3.2.2. Personalized and Humanized User Interaction

Each AI adheres to a "user-centered" design philosophy, offering highly personalized guidance and flexible adjustment mechanisms to ensure that each user receives music that aligns with their unique aesthetic and creative vision. This deep interaction not only enhances user engagement and satisfaction but also promotes the evolution of AI music creation towards more personalized and customized directions.

3.2.3. Wide Inclusivity and In-depth Exploration of Music Styles

In terms of musical diversity, all three AIs demonstrate high inclusivity, adeptly handling styles ranging from classical to modern, and from mainstream to niche genres. Notably, AIVA AI, with its unique learning mechanism, explores and replicates the styles of historically significant composers, infusing new vitality and inspiration into the music creation field. SUNO AI, with its rapid generation capabilities and multilingual support, further breaks down geographical and linguistic barriers in music creation.

3.2.4. Differentiated Technological and Application Positioning

In terms of technology and application, the three AIs each occupy distinct positions. Xingzhe AI focuses on the music education sector, bringing unprecedented changes and innovations through deep integration of AI technology. AIVA AI specializes in the professionalism and artistry of music creation, aiming to lead in this domain. SUNO AI, with its efficient output and user-friendly features, provides a convenient and effective music creation platform for both general enthusiasts and professional musicians.

3.2.5. Precision and Flexibility in Market Positioning

Regarding market positioning, all three AIs demonstrate high precision and flexibility. Xingzhe AI primarily targets the educational market, offering intelligent solutions to schools and music education institutions. AIVA AI, with its broad audience base and diverse application scenarios, occupies an important position in the music creation field. SUNO AI flexibly responds to market demand changes, serving both casual music enthusiasts and professionals with efficient creation needs.

In summary, the three music AIs have achieved significant accomplishments and breakthroughs in their respective fields. They not only advance the rapid development and widespread application of AI music creation technology but also inject new energy and vitality into the preservation and innovation of musical art. With ongoing technological advancements and the continuous expansion of application scenarios, it is reasonable to believe that these three music AIs will play increasingly important roles and provide greater value in the fields of music creation and education.

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4. Transformation and Reshaping of Student Roles Under the Background of Art Curriculum Standard Reforms

After three years of in-depth discussion and review by the Art Curriculum Standard Revision Group, the "Compulsory Education Art Curriculum Standard (2022 Edition)" (hereinafter referred to as the "Standard") was introduced in 2022. This marks a new development phase for art education in China's compulsory education stage. Compared to the 2011 version of the music curriculum standard, this revision significantly deepens the educational connotations. It concretely implements the essence of the Party's educational policies into the core competency framework of the art curriculum, focusing on four dimensions: sensitivity in aesthetic perception, excellence in artistic expression, vibrancy in creative practice, and depth in cultural understanding. These dimensions serve as core directions for shaping students' essential qualities and key abilities comprehensively.

4.1. Interpretation of Creative Practice

As a critical component of artistic core competencies, creative practice has been endowed with new-era significance and practical pathways. It emphasizes interdisciplinary integration, encouraging students to assimilate knowledge from various disciplines, closely connect with real-life contexts, and boldly explore and innovate to achieve a dual leap in artistic creation's individuality and practical application value.[2]In this process, students can not only stimulate boundless imagination and creativity but also cleverly leverage modern technology, particularly artificial intelligence, to expand the boundaries of artistic creation and deepen the scope and depth of artistic experiences.

Specifically, teachers can design a series of innovative teaching activities. For example, after guiding students in creating music works, they can use Xingzhe AI's intelligent assessment function to provide personalized feedback and guidance, allowing students to intuitively grasp the internal logic and aesthetic value of their music works while mastering the essence of AI technology in creation. Additionally, artificial intelligence can act as an accelerator for creative practice. For instance, SUNO AI can instantly generate artistic works based on students' creative ideas, allowing students to experience the charm of the integration of art and technology and inspire their imagination about future forms of art. More importantly, the interdisciplinary integration concept advocated by creative practice has been unprecedentedly strengthened with the aid of AI technology. Intelligent platforms like Xingzhe AI can break down disciplinary barriers, achieving cross-disciplinary integration of music with sports, visual arts, science, and other subjects. They can design challenging comprehensive learning tasks that promote the overall enhancement of students' comprehensive qualities and innovative abilities. This interdisciplinary teaching model based on creative practice not only aligns with the trend of contemporary development but also lays a solid foundation for cultivating the composite talents needed by future society.[3]

4.2. Transformation and Reshaping of Student Roles

Under the wave of artificial intelligence, the role of students has undergone an unprecedented and profound transformation, evolving from passive recipients of knowledge to active explorers, knowledge creators, and efficient collaborative learners. Online music education serves as an extension and revolutionization of traditional music instruction. It embodies an online, interactive training and learning paradigm, leveraging the Internet as its backbone. This modality harnesses modern smart mobile devices and advanced network technologies to facilitate remote, synchronized, and interactive teaching, learning, and training experiences through a dedicated platform. The AI-infused landscape of online music education encompasses diverse avenues such as live streaming of renowned teachers' lectures and presentations, video-on-demand access to classroom sessions and educational films, video-based question-and-answer sessions, online tutorials, study forums, and

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teacher-student chatrooms.[4]This shift not only requires students to possess more comprehensive qualities and exceptional adaptability to handle the complex challenges and endless opportunities of the future society but also reflects a deep-seated innovation in educational philosophies and a reshaping of talent development models.

4.2.1. Leap from Passive Reception to Active Exploration

The precise intervention of artificial intelligence has completely overturned the traditional "spoon-feeding" teaching model.[5] By customizing personalized learning paths, AI paves a road for students based on their potential and interests. It intelligently analyzes each student's ability differences and learning habits, providing customized learning content, making music education no longer confined to fixed frameworks but instead a domain for students to choose and explore independently. Moreover, the global repository of interconnected educational resources allows students to transcend temporal and spatial boundaries, immersing themselves in a rich and diverse world of music, from classical to modern, from Eastern to Western, fostering boundaryless communication and inspiration, and significantly broadening their artistic vision and cognitive boundaries. Additionally, the rise of social media and online learning communities has further promoted real-time interaction and deep communication between teachers and students, and among peers, adding limitless vitality and possibilities to learning.

4.2.2. Transcending Single Skills Towards the Enhancement of Comprehensive Competencies

Artificial intelligence not only exists as a learning tool but also serves as a powerful engine driving students' autonomous exploration and interdisciplinary integration. It encourages students to break out of traditional subject frameworks and bravely explore unknown fields, integrating music with sports, visual arts, science, and other disciplines to form unique innovative perspectives and comprehensive application skills. In this process, students not only master techniques and methods of music creation but also learn how to use diverse thinking to solve problems, fostering habits and abilities for self-directed learning and lifelong learning. Additionally, the promotion of collaborative learning models helps students learn communication, coordination, and leadership within team settings. The enhancement of these soft skills has immeasurable value for their future integration into and contributions to society.

4.2.3. Elegant Transition from Knowledge Consumers to Knowledge Creators

With the emergence of intelligent creation tools like SUNO AI, music creation is no longer an unattainable dream but a tangible practice. Students only need to provide simple creative inputs and, with the help of AI, transform their imagination into reality, creating their own musical works. This process not only lowers the barriers to creation but also greatly stimulates students' creativity and imagination, shifting them from passive recipients of knowledge to active creators. Furthermore, AI's evaluation and feedback mechanisms provide students with instant, objective guidance, helping them continuously optimize and improve their work in practice, achieving a leap from "creation" to "refined creation."[6] This role transformation signifies that students are no longer merely consumers of knowledge but are capable of applying what they have learned to create new value and lead new trends as future explorers.

In summary, the deep integration of art and artificial intelligence under the new "Standards" not only reshapes the landscape of art education but also leads to a comprehensive upgrade in student roles. In this process, students need to actively embrace change, continuously improve themselves, and step into the future filled with challenges and opportunities with greater enthusiasm and determination.

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5. Reflection

After delving into the evolutionary trajectory of artificial intelligence (AI), I am profoundly moved by the intricate relationship between technology and art. Since the mid-20th century, when the concept of AI first emerged, to the present stage driven by deep learning, AI has not only witnessed technological miracles but has also triggered an unprecedented revolution in the realm of music creation. The rise of AI in music composition challenges and expands the boundaries of human creativity. From early symbolic reasoning experiments to today's autonomous generation of complex musical works across various languages and styles, each breakthrough in AI leaves us in awe. This journey not only enriches musical expression but also urges us to rethink the essence of "creation." AI's capability to simulate and replicate human cognitive processes—sometimes even surpassing human innovation—leads us to ponder: What role will technology play in the future of music composition and education? The fusion of AI-generated music with music education opens new possibilities for creative practice. AI-powered teaching tools and creation platforms allow students and musicians to explore music theory more deeply, experiment with composition techniques, and collaborate with AI, propelling new developments in both education and creativity. This integration not only inspires fresh ideas but also helps break traditional boundaries, encouraging musicians and students to explore new musical territories.

However, while people admire the convenience and creativity brought by AI music creation, they must maintain a clear understanding: technology is always a tool, not the source of creativity. It cannot fully replace the nuanced observation, profound insights, and authentic emotional expression that humans bring to life. Music, as a profound medium of emotion and culture, is fundamentally about touching hearts and creating resonance. Therefore, in the integration of technology and art, we should uphold the core value of human creativity, allowing technology to act as a catalyst for stimulating potential and expanding artistic boundaries, rather than restricting or replacing it. Additionally, the trend of popularizing AI in music creation brings new opportunities and challenges to the field of music education. The fusion of AI and music education represents a prevailing trend in contemporary education. In the foreseeable future, diverse intelligent equipment and virtual technologies are expected to gain even greater application in educational settings. The emergence of a myriad of intelligent tools stands to elevate students' learning efficiency and quality. To empower teachers in executing course arrangements with greater efficacy and precision, the introduction of AI into classrooms holds immense potential. It offers educators a valuable auxiliary tool, thereby enabling them to allocate greater attention towards tailored instruction, in line with students' individual aptitudes and needs.[7]Under the guidance of the "Art Curriculum Standards for Compulsory Education (2022 Edition)," educators need to actively guide students to transition from passive recipients of knowledge to explorers, creators, and collaborators. Through interdisciplinary teaching strategies and personalized learning paths, educators should foster students' core competencies and innovative abilities, enabling them to enjoy the beauty of music while also becoming active contributors to social progress and cultural prosperity.

6. Conclusion

This paper explores three AI music tools that demonstrate immense potential in stimulating creativity and imagination among students. The practical application of these tools helps students not only acquire more musical skills and knowledge, enhancing their musical literacy, but also fosters teamwork and collaboration. Each AI tool brings unique advantages to music education: SUNO AI is particularly suitable for students seeking quick creative inspiration or improving composition efficiency. It encourages students to infuse their emotions and personal needs into musical works, making music a powerful tool for expression and communication. AIVA AI offers similar

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functionality to SUNO AI but supports multiple musical styles, catering to diverse student needs in composition. Xingzhe AI seems more appropriate for teaching activities in music education. With integrated features like AI-assisted lyrics writing, composition, and arrangement, it significantly lowers the barriers to music creation. Xingzhe AI also provides visual score teaching guidance, helping students improve pitch and rhythm accuracy. Furthermore, its interdisciplinary teaching approach broadens students' knowledge. Together, these three AI tools enrich educational content and ignite student creativity, bringing new vitality and possibilities to music education.

In summary, the development of music AI not only highlights the power of technology but also represents a bold exploration of the limits of human creativity and imagination. Looking to the future, we should maintain an open and inclusive attitude, embrace the changes and challenges brought by technology, while remaining true to the essence and value of art, and collaboratively create a new chapter of harmonious coexistence between technology and art.

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