Application of Computer Multimedia Technology in High School Music Creation Teaching: Current Situation and Strategies

Keran Yang*
Quhua Normal University, China
*Corresponding author: 34811679327@std.uestc.edu.cn

Abstract

The rapid development of computer multimedia technology has brought change opportunities and new challenges for high school music education. This paper is based on the "general high school music curriculum standards (2017 version of the 2020 revision)" in the "music composition" module requirements, combined with the content of the human voice version of the "music composition" textbook, analyzes the potential for the application of computer multimedia technology in high school music composition teaching, describes the current teaching faced by the limited effect of hierarchical teaching, the students' practice ability is weak, the textbook is not synchronized with the technological update and other issues. The study takes 39 students from National High School in Taian City, Shandong Province as the object, and puts forward targeted strategies through teaching practice: building a multimedia teaching platform, implementing personalized teaching; introducing project-based creative practice, strengthening process evaluation; integrating multi-source materials, and dynamically updating teaching content. The study shows that the reasonable application of computer multimedia technology can effectively enhance students' interest and ability in music composition and provide reference for the reform of high school music composition teaching.

Keywords

Computer Multimedia Technology, High School Music Composition Teaching, Music Creation Module, Personalized Instruction, Project-Based Practice

With the deep integration of information technology and education, computer multimedia technology has become an important force in promoting innovation in music education due to its integration, interactivity, digitization, and other characteristics[1].The revised 2020 version of the "Music Curriculum Standards for Ordinary High Schools" clearly proposes to "encourage students to apply modern information technology and multimedia technology to the process of music creation and expression". Special content such as "computer music" and "composition software" has been set up for "Music Compilation and Creation" textbooks such as the People's Music Edition and the Hunan Arts Edition, providing policy and textbook basis for the integration of technology and teaching. As a key link in cultivating students' artistic creativity, high school music creation teaching currently faces many practical challenges: traditional teaching methods are single and difficult to stimulate students' interest in creation[2]. There are significant differences in students' music foundations, and the effectiveness of the unified teaching model is limited; The lack of synchronization between technological development and teaching content updates leads to a disconnect between what students have learned and their actual needs. In this context, exploring the application path of

computer multimedia technology in high school music creation teaching cannot efficiency but aching methods and improve teaching efficiency, but also help students establish the concept of "integrating music learning with modern information technology", which is in line with the development trend of interdisciplinary integration in the construction of "new liberal arts". This article combines theoretical research and teaching practice to analyze the potential application of computer multimedia technology in high school music creation teaching, sort out the main problems facing current teaching, propose targeted development strategies, and provide practical reference for high school music educators[3].

The Potential Application of Computer Multimedia Technology in Music Creation Teaching

Computer multimedia technology is a technology that comprehensively processes various information such as text, graphics, audio, and video through computers. Its digitalization, real-time performance, interactivity, and other characteristics are highly compatible with the needs of music creation and teaching. In high school music composition teaching, its application potential is mainly reflected in three aspects[4].

Personalized learning support

Computer multimedia technology can accurately capture students' learning habits and ability differences through the data analysis function of music software. For example, the piano rolling shutter window of Cubase software can visually display the pitch (vertical position) and duration (horizontal length) of notes, and students can adjust their learning progress according to their own rhythm perception ability - students with weak foundations can practice evenly distributed rhythms first, while students with strong abilities can try non-uniform rhythms (such as the free rhythm of Shaanxi North Xin Tianyou). This personalized support can effectively address the drawbacks of the traditional classroom's one size fits all approaches, allowing every student to achieve a sense of achievement at an appropriate level of difficulty.

Innovative teaching resources and methods

Computer multimedia technology can break through the limitations of traditional musical instruments and blackboard writing, providing rich resources for teaching[5]. On the one hand, the audio software (as Hypersonic) includes hundreds of tones such as piano, ethnic instruments, orchestral instruments, etc. Students can freely combine them to enrich the expressive power of their works; On the other hand, notation software (as Sibelius 7) can automatically convert melodic lines into standardized sheet music, solving the problem of tedious manual notation. In addition, features such as virtual drummers (Groove Agent SE) and real-time audio feedback can transform abstract music concepts into concrete content that can be heard and seen, enhancing the intuitiveness of teaching.

Dynamic optimization of teaching content

By analyzing students' creative achievements and feedback data, computer multimedia technology can assist teachers in optimizing teaching content. For example, in melody writing teaching, software can track students' mastery of techniques such as "repetition" and "jumping in", and teachers can adjust the focus of subsequent teaching accordingly. To address the common difficulties faced by students in creating ethnic music rhythms, specialized training in non-uniform rhythms can be added. This

data-driven dynamic optimization can make teaching more tailored to students' needs and ensure continuous improvement in teaching quality[6].

The Current Situation and Challenges of High School Music Creation Teaching

Despite the significant application advantages of computer multimedia technology, current high school music composition still faces many challenges in the process of technological integration, mainly reflected in the following three aspects

The effectiveness of hierarchical teaching is poor

There is a significant difference between students' music foundation and computer operation ability, which poses difficulties for hierarchical teaching. The teaching practice of Ethnic Middle School in Taian City, Shandong Province shows that among the 39 students, only 15.4% have excellent music theory foundation, and 84.6% are qualified; Only 7.7% have used music creation software, and most students lack awareness of technical application. Although teachers try to divide teaching levels, there are two problems: first, limited teacher resources make it difficult to design teaching content and evaluation standards that are suitable for multiple levels[7]; Secondly, some students may experience psychological discomfort due to being classified as the "basic layer", which affects their learning motivation. This situation makes it difficult for technology applications to cover all students, limiting the overall improvement of teaching effectiveness.

Students have weak practical abilities

Currently, in high school music composition teaching, theoretical courses account for a high proportion and practical activities are insufficient[8], resulting in students' understanding of theory but inability to create. Specifically, firstly, due to limitations in teaching staff and hardware, there is a shortage of practical course hours. The "Music Editing and Creation" module at Taian Ethnic Middle School in Shandong Province only has one class per week, making it difficult to carry out systematic creative training; Secondly, the traditional evaluation system focuses on theoretical assessment, while the evaluation of practical abilities lacks standardized mechanisms, and the feedback and improvement of students' creative achievements are ignored; Thirdly, there is a lack of depth in school enterprise cooperation (such as cooperation with music studios), making it difficult for students to access real creative scenarios. Their works often remain at the level of simple melody writing, lacking practical application value.

Textbooks and technological updates are not synchronized

The rapid iteration of computer music technology has led to a lag in updating textbook content, resulting in a disconnect between teaching and practice. Although the 2022 edition of the "Music Editing and Creation" textbook by People's Music has added a unit on "Computer Music Fundamentals", it still does not cover the latest features of mainstream software such as Cubase 12 and Studio One; The introduction of "composition software" and "computer arrangement" in the Xiangyi and Huacheng editions of textbooks is also relatively basic. In addition, the textbook review mechanism tends to be conservative, and emerging technologies (such as AI composition assistance tools) are difficult to quickly enter the teaching system. Students need to relearn mainstream industry tools after graduation, which increases the cost of adaptation.

Strategies for Empowering Music Creation Teaching with Computer Multimedia Technology

In response to the above challenges, combined with the teaching practice of Ethnic Middle School in Taian City, Shandong Province, the following strategies are proposed.

Build a multimedia teaching platform and implement personalized teaching

Building an intelligent teaching platform based on computer multimedia technology to achieve a personalized teaching process of "Accurate Diagnosis — Layered Push — Dynamic Adjustment". Specifically including:

Accurate diagnosis: Establish a student's ability profile through basic music theory tests (such as rhythm recognition and notation standards) and software operations (such as Cubase's note input)[8]. For example, students with weak rhythm perception are marked as "need to strengthen equal rhythm training", while students proficient in software operation are marked as "can try multi track arrangement".

Layered push resources: The platform pushes adaptive resources based on student portraits: the basic layer focuses on visual exercises of rhythm and beat (using Cubase's "Align" function to train stable shooting); Step up the training of melody development techniques (comparing the effects of "repetition" and "contrast" techniques using Sibelius); Increasing the level introduces multi track arrangement tasks (adding different instrument tones with Hypersonic).

Dynamic adjustment of progress: By using software to record students' practice time, completion of work, and other data. When the basic level student's complete rhythm training three times in a row with an accuracy rate of over 80%, the introductory content of melody writing will be automatically pushed[10]; Regularly push industry new software (such as Bitwig Studio) operation guides students at the improvement level to maintain technical sensitivity. This personalized teaching model has shown significant effectiveness in the practice of ethnic middle schools in Taian City, with 82% of students stating that they can make progress in difficulty levels that suit them, and their creative enthusiasm has increased by 60% compared to traditional classrooms.

Introducing project-based creative practices and strengthening process evaluation

Using actual creative projects as carriers, combining theoretical learning with practical operation, and enhancing students' practical abilities through the process of "Project Design — Group Creation — Exhibition Reflection":

Project Design: Design projects that combine textbook content with life themes, such as "Hometown Music Adaptation" (using Cubase to adapt local folk songs) and "Natural Sound Creation" (using Hypersonic to simulate sound effects such as wind and bird songs). Generative AI tools (such as ChatGPT) can assist teachers in quickly generating project task sheets, clarifying background, objectives and evaluation criteria, and saving lesson preparation time.

Group collaboration creation: Adopting "heterogeneous grouping" (each group includes students with different abilities), simulating the division of labor in a real creative team: students with weak foundations are responsible for rhythm writing, students with advanced levels design melodies, and students with advanced levels complete multi track arrangements[11]. Through intelligent platforms (such as classroom management systems), progress can be shared, and teachers can provide real-time feedback,

solving the problem of "one person taking care of everything while others observe".

Multiple evaluation feedback: Establish a "process outcome" evaluation system: Process evaluation focuses on students' performance in software operation (such as Cubase's strength adjustment) and team communication; The achievement evaluation adopts the model of "student mutual evaluation + teacher evaluation + software analysis" — the software can automatically detect the fluency of the melody (such as the rationality of interval jumping), while the teacher focuses on creativity and emotional expression. The practice of Taian Ethnic Middle School shows that the evaluation model improves the completeness of students' works by 40% and significantly enhances their sense of teamwork.

Integrate multiple sources of materials and dynamically update teaching content

Breaking through the limitations of textbooks, integrating multi-channel resources, and building a dynamic teaching content system of "foundation + frontier":

Multi source material integration: Obtain resources from academic journals (such as computer music research in "China Music"), industry forums (such as "midifan"), online courses (such as Coursera's "Introduction to Music Technology") and other channels. Subsequently, the core content will be extracted through generative AI tools and transformed into case studies suitable for high school teaching. For example, simplifying the "AI Composition Algorithm" in professional papers into a demonstration of the "Melody Auto Fill" function can help students understand the forefront of technology.

Expansion of textbook content: On the basis of the "Fundamentals of Computer Music" unit in the RenYin version textbook, mainstream software practical operation guides (such as Cubase's audio editing and Sibelius' score export) will be added, and digital cases of ethnic music will be supplemented (such as using software to simulate gain timbre), making the textbook content more practical".

Dynamic update mechanism: At the end of each semester, feedback from students and teachers is collected through a questionnaire survey. Based on the development trend of music technology (such as the popular "cloud collaborative composition" tool in 2023), 10% -15% of the teaching content is updated to ensure that students' learning is synchronized with industry development.

Conclusion

Computer multimedia technology provides a new possibility for high school music composition teaching. With advantages, such as personalized support, resource innovation and dynamic optimization, which can effectively address the problems of difficult stratification, weak practice and slow updates in current teaching. By constructing multimedia teaching platforms, introducing project-based practices, and integrating multiple sources of materials, strategies can be adopted to promote the transformation of music creation teaching from "traditional teaching" to "technological integration", helping students to master creative skills while establishing interdisciplinary thinking and innovative awareness. Of course, the application of technology needs to avoid the misconception of "emphasizing tools over art" computer multimedia technology is ultimately an auxiliary means, and the core of teaching still lies in cultivating students' music aesthetics and creativity. In the future, it is necessary to further explore the balance between technology and art, so that high school music creation teaching can keep up with the pace of technological development

while maintaining the essence and original intention of art education.

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