

Research on the Innovative Mode of Virtual Simulation Teaching in Vocal Music Course

Jianying Li*

Suqian College, Suqian 223800, Jiangsu Province, China

*Corresponding author: Jianying Li, piaoyundetian@sohu.com

Copyright: © 2024 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: Virtual simulation technology has brought new development opportunities for vocal music teaching with its unique advantages and wide application value. The building of the Vocal Music course virtual simulation teaching mode discusses the application of virtual simulation technology in vocal music teaching. The virtual simulation vocal music teaching environment provides students with a more intuitive, vivid, personalized learning experience, not only can stimulate students' interest in vocal music learning and enthusiasm but at the same time can effectively improve the students' learning effect and teachers' teaching efficiency, so as to better serve the applied undergraduate colleges vocal music teaching and innovative talent training.

Keywords: Vocal Music course; Virtual simulation; Vocal music teaching

Online publication: July 29, 2024

1. Introduction

Since the 21st century, the new technological revolution led by the development of information technology has accelerated its evolution and the vocal music teaching in colleges and universities has also ushered in unprecedented opportunities for development. Adhering to the principle of "Student-centered, output-oriented and continuous improvement," it highlights application-driven and resource-sharing, taking experimental teaching informatization as the endogenous variable of systematic reform of higher education, high-quality experimental teaching helps higher education teaching quality change and overtaking and help the construction of a strong higher education country^[1]. Although traditional vocal music teaching has cultivated a large number of excellent vocal music talents, it still faces many challenges and problems in terms of teaching methods, means and resource allocation. Traditional vocal music teaching mainly depends on teachers' individual experience and ability, and the excavation of students' personalized needs and potential is insufficient^[2]. Therefore, exploring the teaching mode and method of artificial intelligence and improving the efficiency and quality of vocal music teaching has become an urgent problem to be solved in the field of vocal music teaching and the application of virtual simulation technology in many courses provides a new development path for the teaching reform of vocal music curriculum.

2. The inevitability of constructing the virtual simulation teaching mode of Vocal Music course

There are many research achievements on virtual simulation teaching in academic circles, but none of them involves vocal music teaching. Virtual simulation is a comprehensive of that uses a computer system that can create and experience a virtual world to imitate another real system, combined with various technologies such as human-computer interaction^[3]. Virtual simulation technology has the characteristics of immersion, interaction and fidelity, which is conducive to stimulating students' enthusiasm and initiative in learning and improving the teaching quality^[4]. Virtual simulation technology combines human-computer interaction, three-dimensional modeling, image processing and other advanced technologies to provide users with an immersive experience^[5]. In vocal music teaching, the application of virtual simulation technology has significant advantages, Chengdu Vocational Arts University took the lead in building a VR laboratory, which was applied to vocal music teaching (Figure 1).

- (1) Virtual simulation technology is highly immersive. Through virtual reality (VR) or augmented reality (AR) equipment, students can be placed in a realistic virtual vocal music classroom as if personally experiencing the atmosphere of vocal music learning. This immersive experience can stimulate students' interest and enthusiasm for learning, enabling them to participate more actively in vocal music learning^[6].
- (2) Virtual simulation technology has strong interactivity. In the virtual environment, students can interact with the virtual teachers in real time to obtain personalized guidance and feedback. At the same time, students can also improve their singing ability and performance level by simulating the real performance scenes. This interactive learning method can help students better understand and master vocal music knowledge and improve the learning effect^[5].
- (3) Virtual simulation technology is highly realistic. Through high-precision 3D modeling and image processing technology, the virtual vocal music classroom can present scenes and details like the real classroom. This realistic virtual environment can provide students with a more real learning experience, giving them a deeper understanding of the connotation and charm of vocal music art.



Figure 1. VR Laboratory of Chengdu Vocational Art University.

3. The purpose of the virtual simulation teaching mode construction of the vocal music course

With its unique advantage and wide application value, virtual simulation technology brings new development opportunities for vocal music teaching. Central Academy of Music, in the virtual simulation technology, explores the music visualization technology to build the Vocal Music course ^[7]. Virtual simulation teaching mode provides students with a more intuitive, vivid, personalized learning experience to better serve the applied undergraduate colleges' vocal music teaching and innovative talent training.

- (1) Further promote the deep integration of information technology and vocal music course teaching. As an important part of art education, the combination of vocal music courses and information technology shows unprecedented potential and advantage ^[8]. Constructing the virtual simulation teaching mode of Vocal Music courses is important to deeply integrate information technology and vocal music teaching. Through the introduction of virtual simulation technology, vocal music teaching is no longer limited to physical classrooms, piano rooms and other places but can use computer, network and virtual reality equipment to create an all-round, multi-angle learning space for students. This deep integration can not only greatly enrich the teaching means, improve the flexibility and interactivity of teaching, but also effectively stimulate students' learning interest and creativity and promote the innovation and development of vocal music teaching ^[9].
- (2) Strengthen the construction and application of high-quality resources in higher education experimental teaching. On the one hand, it can integrate the vocal music teaching resources inside and outside the school and build a virtual simulation experimental teaching platform with rich resources and perfect functions to provide students with more convenient and efficient learning ways. On the other hand, it can strengthen the sharing and communication of experimental teaching resources, promote cooperation and communication between different universities and improve the utilization rate and benefit of experimental teaching resources. At the same time, through the virtual simulation experimental teaching platform, teachers can also carry out remote experiment teaching, online tutoring and other activities to expand the space and time of experimental teaching and improve the coverage rate and quality of experimental teaching.
- (3) Focus on improving the quality of higher experimental teaching and the level of practical education. First, fully integrating virtual technology with vocal music teaching can enhance the intuitive and interactive characteristics of vocal music teaching while improving the practicality and authenticity of experimental teaching ^[10]. Next, virtual simulation technology can provide a personalized learning experience and feedback mechanisms. It allows the students to conduct independent learning and practice according to their learning situation and needs, improving the effectiveness of experimental teaching ^[11]. In addition, virtual simulation technology can also expand the boundary and scope of experimental teaching, expose students to more vocal works and performance forms, at the same time broaden the students' artistic vision and aesthetic ability, and improve the quality and level of practical education ^[12].

4. Design of virtual simulation experiment training for vocal music course teaching

The virtual simulation teaching platform of the Vocal Music course is divided into two modules: student's end and teacher's end, operating mode is shown in Figure 2.

4.1. The teacher's end

- (1) Experimental design: Through the platform, teachers can create diversified vocal skills training tasks, such as basic vocal training, treble breakthrough, timbre shaping, works singing, etc., and describe the purpose, object, method and process of the experiment in detail. Teachers can design personalized experimental tasks according to the characteristics and singing levels of different students to improve the pertinence and effectiveness of teaching ^[13].
- (2) Experimental implementation: Teachers can monitor the students' experimental training process in real-time and record every training detail and process to accurately evaluate the students' independent singing training. During the experiment, teachers can give students guidance at any time to help them correct their mistakes and improve their singing skills.
- (3) Experimental feedback: The platform can collect and display students' experiments and attempts in real-time, including audio recordings, video, pictures and other forms, to facilitate teachers' comprehensive understanding of students' vocal music training status. The system will sort and classify the questions and experimental data raised by students during the singing training for teachers to consult and reply.
- (4) Resource sharing: The teacher team can share the latest vocal music teaching resources and experimental research results on the platform and promote the exchange of experimental information and updates ^[14]. Teachers can also discuss and communicate on the experiment content to jointly improve the quality and level of experimental teaching. Teachers can share experimental data on the platform, including students' singing recordings, videos, performance statistics, etc. These data can provide a reference for other teachers and promote the improvement of teaching methods and innovative ^[15].

4.2. Student side

- (1) Login system: Students can log in to the vocal music virtual simulation teaching experiment platform through their personal account and password to participate in the experimental teaching conveniently and quickly. At the same time, students can check their own learning progress and experimental results.
- (2) Acceptance tasks: Students can view and accept the experimental task points released by the teacher on the platform to understand the experimental requirements and objectives. Students can choose suitable experimental tasks for learning and training according to their own time and interests.
- (3) Independent singing: Students can make full use of the recording and video functions provided by the platform. In the training process, students can refer to the process guidance information set by the teacher to practice to ensure the scientific effectiveness of the training.
- (4) Data processing: The platform will automatically process students' independent singing and extract key data for analysis and evaluation. Students can view their experimental data and analysis results through the platform to understand their own shortcomings and progress.
- (5) Experimental report: After the experiment, the platform will automatically issue the experiment report, including students' grades, feedback, teachers' evaluations and other aspects. Students can also view and share their own experimental data and exchange their learning experiences with other students. Students can learn from each other through data sharing to improve their learning effect and singing level.

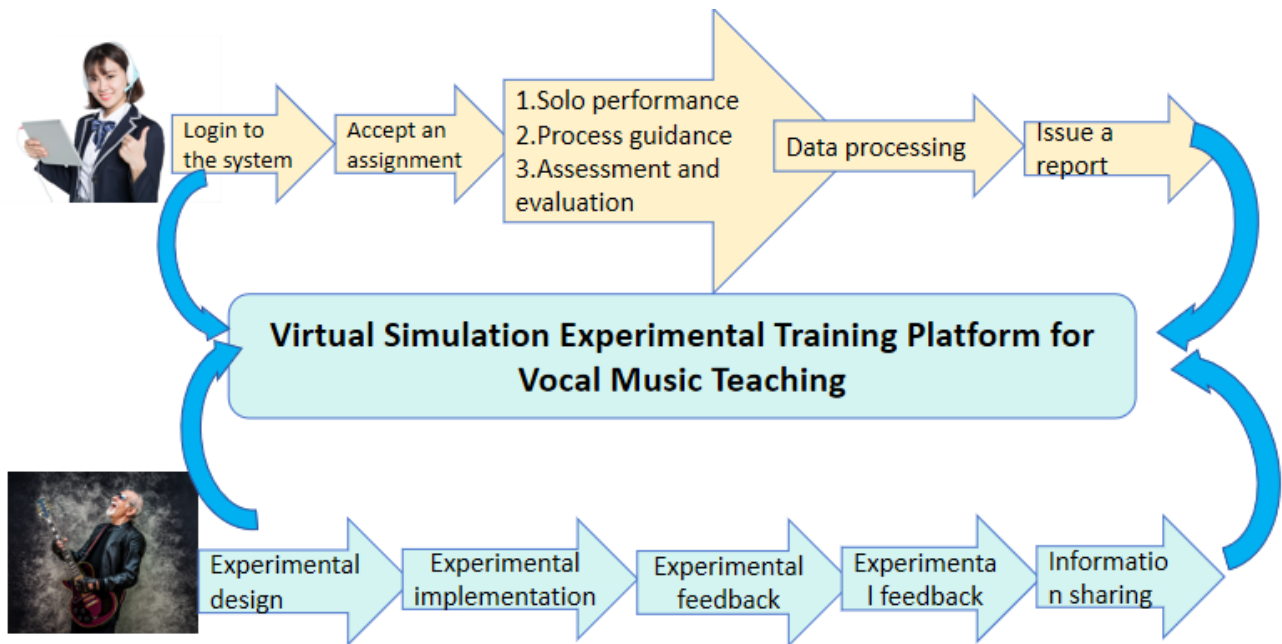


Figure 2. Virtual simulation experiment training platform of vocal music course teaching.

5. Effect evaluation of innovative mode of virtual simulation teaching in vocal music course

5.1. Evaluation of the teaching effect

Under the virtual simulation teaching mode of the Vocal Music course, teachers can comprehensively evaluate students' singing levels, learning interests and independent learning abilities. First of all, students can understand the vocal music singing skills more intuitively through the training of the virtual simulation platform and practice repeatedly in the simulation environment, so that their singing level and skill mastery ability can be significantly improved. Secondly, the virtual simulation teaching mode provides students with a richer and more interesting learning experience, so they have a higher interest and enthusiasm for vocal music learning. At the same time, students can independently choose learning tasks, set learning goals on the platform, and conduct self-assessment and adjustment through data analysis to cultivate students' independent learning ability and self-management abilities.

5.2. The advantages and disadvantages of the teaching mode

5.2.1. Advantages

- (1) Intuitiveness and interactivity: The virtual simulation teaching platform enables students to understand vocal music skills more intuitively and provides real-time feedback and interaction, which enhances the interest and interactivity of learning.
- (2) Personalized teaching: The platform can provide personalized learning tasks and feedback according to students' learning conditions and needs to make the teaching more targeted and effective.
- (3) Resource sharing and collaboration: The platform allows teachers and students to share teaching resources and experiences, promote mutual learning and collaboration, and improve the quality and efficiency of vocal music teaching.

5.2.2. Shortcomings

- (1) Technical threshold: For most students and teachers, the virtual simulation teaching platform is an emerging technology product that needs a certain amount of time and energy to learn the operation technology and needs time to adapt to the simulation training scene.
- (2) Device dependence: The virtual simulation teaching platform needs to rely on specific equipment and network environments and can only be used in specific experimental scenarios.
- (3) Lack of emotional communication: Although the virtual simulation platform provides rich interactive functions, it still cannot replace the face-to-face emotional communication between teachers and students in the actual vocal music classroom teaching.

6. Conclusion

The digital era has brought new opportunities for developing and reforming vocal music teaching in colleges and universities. Building a new teaching mode can maintain the advantages of the traditional teaching mode and break through the bottleneck limited by time, region and resources. It is not only the focus of the current construction of new liberal arts but also the focus of promoting the construction of education digitalization. This paper proposes a solution based on virtual simulation technology by analyzing the challenges and requirements of current vocal music teaching. This mode uses advanced technology to simulate the real vocal music teaching environment, which enhances students' intuitive feelings and participation and effectively improves students' learning effect and interest through personalized teaching design and real-time feedback mechanisms. The construction of the innovative mode of virtual simulation teaching in the Vocal Music course has brought new development opportunities for vocal music education, which is worth our further exploration and practice.

Funding

Industry-University Cooperation and Collaborative Education Project of the Ministry of Education "Research on Vocal Music Virtual Simulation Teaching Innovation Model" (Project No.: 231005275315203); Nanjing Weiqi Intelligent Technology Co., LTD.; Key Project of Jiangsu Provincial Education Science Planning "Research on the Construction and Teaching Reform Path of Universities under VR Technology" (Project No.: B/2022/01/181)

Disclosure statement

The author declares no conflict of interest.

References

- [1] Ministry of Education, 2018, Notice on the Construction of National Virtual Simulation Experimental Teaching Project (No.5), viewed May 2, 2024, https://www.gov.cn/zhengce/zhengceku/2018-12/31/content_5440531.htm
- [2] Chen J, 2024, Artificial Intelligence Will Profoundly Influence the Vocal Music Field. Music Weekly Report, Beijing, A07.
- [3] Wei Y, Wang F, Feng Y, 1999, Virtual Reality and System Simulation. Computer Simulation, 1999(2): 63–66.
- [4] Zhu Y, An J, 2023, Meta-analysis of the Effect of Virtual Experiments on Learning Effects. Open Learning Research, 28(2): 32–42.

- [5] Tan Y, Guo L, 2024, Research on Online Vocal Music Teaching Strategies Under the Perspective of Interaction Theory. *Musical Life*, 2024(3): 85–88.
- [6] Liu W, Zhang L, Jiang Y, et al., 2024, Construction and Practical Exploration of the Virtual Simulation Project in the Experimental Teaching of Biological Products, *Journal of Jilin University of Medicine*, 2024(4): 1–4.
- [7] Ma C, 2021, Application of Virtual Simulation Technology in the Inheritance and Communication of Dabie Mountain Folk Songs. *Journal of Nanyang Normal University*, 20(6): 74–76.
- [8] Zhang K, 2024, Teaching Exploration of Vocal Music Courses in Colleges and Universities Under the Background of New Liberal Arts Construction. *Symphony Orchestra (Journal of Xi'an Conservatory of Music)*, 43(1): 119–124.
- [9] Sun J, 2021, Application of Vocal Music Major Teaching Under the Background of Digital Education. *Artist*, 2021(11): 70–71.
- [10] Hong J, Liu W, 2017, Fusion Analysis of Digital Technology in Vocal Music Teaching. *Northern Music*, 37(16): 199.
- [11] Zhang J, Sun S, Gong S, et al., 2024, Continuous Improvement of Virtual Simulation Experiment Teaching. *Laboratory Research and Exploration*, 43(1): 125–129.
- [12] He X, Xue J, 2024, Analysis of Teaching Design for Virtual Simulation Teaching Experience Optimization for Digital Media Art Major. *Industrial Design*, 2024(3): 91–94.
- [13] Chen Z, 2024, Application of Virtual Simulation Technology in Display Art Design Teaching. *Grand View*, 2024(2): 137–139.
- [14] Zhang W, Si W, 2023, Take the Public Management Course as an Example. *College Education*, 2023(24): 36–40.
- [15] Chen Z, 2022, Construction of “Internet +” Vocal Music Teaching Mode in Secondary Vocational Schools. *Journal of Jilin Institute of Education*, 38(10): 90–93.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.