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To be Smart, Music Teaching can be Different

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Abstract. When music deep learning is brought into high school music classes, traditional classroom forms are far from meeting the requirements of music education in the new era. The music deep learning classroom supported by virtual reality technology can pay more attention to students' perception and understanding of music and the connection between music and themselves in the classroom with the help of various teaching modes. Through the study of virtual reality technology, information technology, the fusion of science and a variety of teaching techniques, from body design, collaborative knowledge construction and distributed cognition, scaffolding instruction, the micro genetic method, will be a brand new music classroom, music classroom and the process of situation have to free from traditional constraints. With the proposal of blended learning environment, the construction of music classroom will develop in the course of continuous transformation. Guided by deep learning and supported by virtual reality technology, music classroom will display strong vitality and vitality by integrating various teaching modes.

Keywords. Virtual reality technology; Music classroom; Deep learning; Embodied design; Distributed cognition; Microgenesis

1. Introduction

At present, the teaching situation and means of high school music classroom in China tend to be single, and the classroom development is often limited to the ordinary classroom equipped with a single multimedia. At the same time, in the face of the teacher's "overall" teaching scene, students' understanding and learning of music can not be substantially developed under this condition. Although the high school students' entrance pressure restriction, school music culture construction narrow, school music teaching resources shortage are all contributing to the above phenomenon, but fundamentally, the lack of research on high school music classroom teaching scene model construction makes high school music teaching has to stay at a shallow level. In recent years, the application of virtual reality technology and deep learning are a hot spot in learning science and the development trend of education and teaching research. The emergence of deep learning has pointed out a new development direction for the teaching of various disciplines, and the current teaching methods that integrate various intersecting information technologies have injected new blood into the construction of music classroom scenes.

2. Music Deep Learning

The understanding of deep learning can be developed from two aspects, the intellectual level and the emotional level. At the knowledge level, learners are required to have a relatively clear cognition of the structure system of the knowledge they have learned, and the cognition can be flexibly transferred. On the emotional level, it points to the learner's values. After learning a given content, will the learner pursue

personal and social meaning through the surface concepts of knowledge? Thus, the learner's values will be further constructed. The thinking development process of music learning and other subjects learning is completely different. Music learning cannot be separated from four processes. Creating representations, participating in identity construction processes, language development, creative and critical thinking development. To bring deep learning into the field of music requires appropriate discipline understanding. In terms of music knowledge, learners can easily integrate what they have learned into the structure of music knowledge, and thus bring about the adjustment and reorganization of cognitive structure. Learners can analyze music works and music knowledge from the perspective of humanity, and thus bring about the deepening of values.

In high school, most students tend to lack systematic music knowledge, and their music cognition only stays at the shallow level of popular music, thus causing some constraints on the construction of deep learning scenes in high school music classes. According to the Music Curriculum Standards for Ordinary Senior High Schools (2017 edition, 2020 revision), the core literacy of high school music curriculum is aesthetic perception, artistic expression and cultural understanding, and the curriculum concept is as follows: Highlight the function of aesthetic education to improve aesthetic taste, emphasize music practice to develop creative potential, deepen emotional experience to highlight music characteristics, promote folk music to understand multi-culture, enrich curriculum choices to meet development needs, and improve the evaluation mechanism based on core literacy [1]. Through the above indicators, it can be concluded that the specific performance of deep learning of music courses in high school is as follows: through course learning, learners can have a more systematic cognition of music discipline, and can induce and reason related music concepts through concept maps; Through classroom practice, learners can have a correct representation of natural musical skill expression state (vocal singing, instrumental performance, drama performance, dance performance, music composition), and output natural musical expression; Through the cultivation of music situation, learners can form a more macroscopic understanding about music and individual, music and society, music and survival, and can give their own unique critical response to artistic works, and establish relatively profound values from them.

3. Scene Development And Trial

In this deep learning scene construction experiment of high school music class, a class of high school Senior High School Affiliated to Harbin Normal University was selected, with a class size of 40 students. (The performance of the overall and local music level of the class was obtained through the diagnostic test before the experiment: Most of the students have a certain understanding of basic music theory, most of them have some dabbings in classical music, and some of them can perform music works to a considerable extent for students who are specialized in music). The experiment course is one semester (two classes per week and the time of each class is controlled to be 40 minutes). Classes will be held in the school's intelligent art classroom, intelligent performance classroom and computer classroom (the intelligent art classroom is equipped with 3D projection audio-visual system, AR system, VR all-in-one machine, etc. The intelligent performance classroom is equipped with an electric piano with electronic screen and headphones and a central control system to meet the needs of class size. The computer classroom is equipped with electronic music creation software Studio One. The course content selected for this experiment is based on the first edition of music textbooks for senior high schools published by People's Music Publishing House in July 2019 (there are 7 of them, all of which are compulsory: music appreciation, singing, performance, Music and Opera, Music and Dance, and music composition and creation). The whole experiment process was carried out offline under the premise of meeting the requirements of epidemic prevention and control at that time.

3.1. Bruner's Cognitive Representation Theory

Bruner divides cognitive growth into three stages: action representation, image representation and symbol representation. Recent studies on cognitive representation learning have shown that the above three representation stages do not replace in a straight line direction, and the three representation modes play an integral role in the cognitive development of learners throughout their lives. Based on this, this experiment established that the three representation methods all play a cognitive traction role in teaching. In each class of the experiment process, a teaching link was set up in which different representation ways of learning occurred.

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3.2. *The Introduction Of Embodied Design Ballet Dance Class*

Embodied design has recently become a hot topic in learning science. The core support of embodied design holds that cognition is based on the experience of the body. Embodied learning advocates bringing the learner's body perception into the created learning situation, so as to obtain the meaning of the knowledge through the whole body reaction. In the class themed on the dance and music of Tchaikovsky's four cygnets, we created the dance situation of the four cygnets through the 3D projection audio-visual system in the Art and Wisdom classroom, and let the students feel their own body's rhythm in the dance music through the AR system. The following is a transcript of the main steps of the class.

Import: Create the stage scenery and background music of Swan Lake through 3D projection audio-visual system

Preliminary perception: Invite students to wear AR sensing mobile devices and imitate the ballet decomposition action flow projected in 3D. The movement track of students will be synchronized on the LED screen.

In-depth analysis: The teaching situation of the basic movements of the four cygnet steps was introduced into the VR glasses, and the students entered the one-to-one ballet step teaching situation through VR and carried out body movements in situ. After THE STUDENTS HAVE GOT THE BASIC KNOWLEDGE OF ballet steps, THE teacher invites THE female students and the MALE students to perform a demonstration in the center of the classroom. After the dance, the students came to the intelligent performance room. The teacher linked the performance and development of different parts of the four Cygnet piano score with the dance movements that students had performed when wearing VR. Will students divided into two parts, left and individual practice (students need to wear headphones to keep closed sound environment, electric piano accompanied by electronic screen fingers on the keyboard operation guide, help to ease the piano skill is weak students disorder), and practice to a certain extent, teachers guide students to practice ensemble invited a group of students in the ensemble music to dance. Show the video of dance performance just recorded in class, and inspire students to connect dance and music.

Extend and extend: Create a discussion situation in which students consider whether the performance and development of music can be explained based on symbolic body movements. Presenting Rachmaninoff's Etude for music and painting OP.39 NO.6 Little Red Riding Hood, and organizing students into groups to create and compose the dance of Little Red Riding Hood, reminding students to pay attention to the emotional expression and development of the music, and enlightening students on how to relate the emotion of the music through the speed and posture of body rhythm.

Summary Assignments: Assign pre-class presentation assignments for the next class. Students are required to collect some musical fragments that can express emotions or states in relation to body reactions, and work in groups to integrate the collected musical fragments to create a musical.

3.3. *Music Appreciation Course Based On Collaborative Knowledge Construction*

Cooperative knowledge construction points to the deep construction of knowledge. The ultimate purpose of contemporary collaborative knowledge construction is to develop learners' critical spirit and innovation ability. It describes such a learning situation: individuals cooperate with each other in a specific organization, participate in some purposeful activities together, and finally form some intelligent products such as opinions, thoughts and methods. Collaborative knowledge construction is different from group learning, the former directly points to the establishment of individual roles and ideas. In the appreciation class of traditional high school music class, teachers often only pay attention to how to teach the form and content of music works, but ignore the appeal and expression of students' own cognitive understanding of the works. Therefore, in the music classroom, the application of collaborative knowledge construction can stimulate students' own views and innovations on music to a certain extent. Please look at the following class transcript.

The import:plays the fragment of Mussorgsky's orchestral music "Night on Barren Mountain" through the 3D simulation projection audio-visual system of the Modern Art Center. Display text on multimedia: the roar of non-human voices from deep underground, the appearance of dark ghosts, and then the appearance of the dark God. The eulogizing of the dark God and the mourning of the underworld, at the height of the revelry, came the distant sound of the village church bells, which dispelled the dark spirits.

Initial perception:Students wear VR glasses to watch the orchestra play "Night in Barren Mountain"

In-depth Analysis and Collaborative Knowledge Construction:Teachers lead students to analyze the common structure of orchestral music and the rules of musical development. Students are divided into small groups. Each student is required to discuss and communicate in small groups and complete the following questions: What do I know about PowerGroup? What are my feelings and experiences of "Night in the Desert Mountains"? What do I think is the musical style of "Night in the Desert Mountains"? What are the differences between Tchaikovsky's artistic ideas, creative styles and powerful groups at the same time? What is the biggest difference between my views and those of the other members of the group? The teacher inspects each group and gives each group a piece of A4 paper. Each member of the group has to write their own key words in response to the above questions.

Give your opinion:At the end of the group discussion, the teacher randomly selected students to answer -- After the students answered, the teacher asked: Through the discussion in the group, what is the common opinion of you and other members on the Night of Barren Mountain? What new knowledge and ideas did you get from the other panelists?

Extends:The teacher led the students to the Wisdom performance room. Each student wore headphones to practice playing Debussy's "Moonlight" -- After playing, the teacher asked a question: After playing "Moonlight", what is your understanding of this work? What is your understanding of impressionism? Use some words to describe.

Summary the homework:The teacher leads the students to analyze and summarize the main theme, the secondary theme and the musical image depicted in each theme of "Night on the Barren Mountain". The teacher encourages the students to discuss and exchange their different views and understandings on the same work through collaboration with other students after class. And draw music knowledge they do not know so as to deepen their understanding of the work. The teacher issued the task to students for the weekend: listen to the solo song "Return to Sorrento" in a group and discuss the feelings of the song, and pay attention to the creation background of the song, its melody characteristics and development mode. After that, we presented the results based on group discussion through the class wechat group and Tencent conference.

Online classroom:teachers launched class wechat groups and Tencent conferences on the weekend, where students reported and showed their own and group's achievements online -- teachers guided the groups to make mutual comments.

3.4. The Electronic Music Classroom With Distributed Cognition And Scaffolding Teaching Is Introduced

Distributed cognition is derived from the development of the theory of contextual cognitive learning, which holds that cognition can be carried through various forms (intra -, intra -, media, culture, environment, etc.). Scaffolding teaching introduces the concept of scaffolding in the construction industry, emphasizing the role of external support in facilitating and helping students to complete their tasks. In the class of electronic music creation and editing, students can not complete the task of electronic music creation and editing because of the ambiguity of electronic music and software. Distributed cognitive skills can help students to carry out cognitive input well by carrying out cognitive loops in different cognitive regions. The scaffolding help provided by teachers can help students get out of the cognitive confusion of electronic music and get a more comprehensive understanding of the structure. In the computer classroom and intelligent performance classroom, facing the electronic music processing software Studio One, we use the following strategies to help students master the basic operations required by electronic music creation.

Teaching strategy based on distributed cognition: 1. Software operation record book. Students are told to make handwritten notes on the manual for complex operations that are easy to forget in the process of using the computer, and the teacher checks the manual after class. 2. Share the operation of One function of Studio One as a group. 3. Learn a functional area of the software within the group and complete a monophonic creation using this function. Then the group members exchange with each other, and the swapped members complete the introduction of the original group learning function to achieve the cognitive cycle among the groups. 4. Describe the software function diagram on A4 paper independently from the software environment. 5. Perceive the characteristics of electronic music style through VR headset and AR system.

Through scaffolding teaching, students can be guided to complete the creation of three-voice

electronic music, and teachers can use interactive supports (teacher demonstration, thinking aloud, providing questions) to assist. The following is a transcript of the class.

In the warm-up stage: Xu Jingqing's "Cloud Palace News Sound" and Tez Caday's "Seve" were played. Students responded positively and were eager to create electronic music. Students can preliminarily perceive and understand the rhythm, melody and harmony characteristics of electronic music by wearing VR devices. Students wear AR intelligent sensing devices and conduct dance spot training in the electronic music environment according to the body movement pictures provided by the screen.

Exploration stage: The teacher first shows the creation process of three-part music with different timbres and rhythms. After that, the teacher writes the main process on the blackboard. The students are divided into several groups, and each group completes a three-part electronic music work together. - the teacher handed out to each group task CARDS (completed five section to arbitrary timbre, specify the rhythm, the input of three parts) - teachers visit different team awareness of students living difficult operation as well as to the software function of the structure of the fuzzy, at this moment, the teacher let the students suspended creation, undertake to the student to use the function of thinking aloud demonstration (such as: Students, please look at the big screen, in order to achieve the stability of music input speed, we need to turn on the rhythm and speed tracking, this function will be solved in the middle function area at the top of the main page...) -- The teacher explained the functional areas and connections of each part of the software, and then the teacher issued a software operation manual to each group -- the teacher asked the group about the key problems in the three steps of music input, music editing and music export -- and the group responded according to the questions.

Independent exploration stage: the teacher gradually reduced the help to the students, through a small number of questions to make the students aware of their problem status.

4. Microgenesis Method In High School Music Classroom Application

Microgenesis involves the careful analysis of learning, reasoning, and problem-solving processes. The purpose of microgenesis is not only to identify the factors that affect learning, but also to understand how these factors regulate learning step by step when it occurs [2]. Microgenesis always focuses on the process of cognitive development and change of the observed objects. In high school music classroom, the application of microgenesis method can help teachers understand what factors affect students' learning effect in the process of music learning, and how these factors ultimately contribute to students' musical performance. In order to better grasp the learning state of students, teachers should be good at using micro-generation method to obtain timely growth information from students, so as to better adjust teaching. The following perspectives and strategies can help teachers better master and apply microgenesis method.

4.1. The Changing Process Of Students' Understanding Of Music Works

Students' cognition and understanding of works are facilitated by many factors, including the influence of external input and the subjective cognition formed by students' background experience. In the process of teaching, teachers can focus on what aspects of classroom teaching affect students' understanding of the work.

4.2. Changes In Students' Musical Performance

The development process of music performance is interwoven and complex. Students' psychological activities, emotional state, music cognition, organism state, external support, stage experience and so on will affect the performance level. Students' musical performance is relatively stable in a short period of time. Teachers should continuously observe the changes in students' musical performance, record students' singing, dancing, performance and creation status at different nodes, and try to help students find out the reasons for their inability to make progress.

4.3. The Change Of Students' Mentality During The Course Of Class And The Whole Semester

High school is the key stage of students' development, but also the sensitive stage of development. The emotional development of middle school students is characterized by explosive and impulsive, unstable and bipolar, exposed and recessive, mood and persistence. Teachers should pay full attention to the changes of students' mood and mentality in music class, explore the contributing reasons behind the performance of students, and actively communicate with students after class when they encounter students with

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psychological barriers.

5. Conclusions

The practice and application of virtual reality technology in music classroom deserve attention. In the whole process, some reflections and prospects should be put forward in order to make the music classroom better

5.1. The Teaching Process Can Be Carried Out Through Various Forms, Techniques And Means

The play of music classroom has been affected by many factors, whether from the field of information technology, material science and technology or learning science, the current music classroom is moving toward a new form, a new state of development. On the one hand, the music classroom receives the technical, theoretical support and nutritional supply brought by multi-disciplines. On the other hand, it also faces the challenge and risk of integrating the technology and means of various foreign disciplines into its own discipline field. It can be seen that the development of music classroom still needs the tireless efforts of people from all walks of life. In the deep learning scene construction of high school music classroom, we try to bring into play the maximum effect of modern music classroom through the integration of embodied design, distributed cognition, scaffolding teaching and information technology. At the same time, we also propose to use micro-generation method for more detailed educational observation. However, it needs to be honest that how to promote the maximum personalized development of students in the music classroom and students can better understand the meaning of the music content from a higher perspective, still need to explore from a more optimized music teaching method, more close to the law of cognitive development of the teaching environment. At the same time, we should have the courage to absorb the theoretical and technical wisdom brought by different disciplines. Deep in the music soil, but also to cultivate other disciplines tirelessly, in order to inject endless vitality into the music classroom.

5.2. The Development Of Blended Music Learning Environment

Blended learning environment is the current wave of learning environment design. Through the integration of multiple classroom forms, students can learn across different learning situations. Music class is limited to a single cultural classroom, students' enthusiasm for learning, the development of music cognition has been greatly restricted. In addition to the art intelligent classroom, performance classroom and computer classroom, classrooms, scenes and exhibition halls with other functions and functions can also be integrated into the music classroom (art gallery, museum, dance studio). The integration of online and offline class is the core of the blended learning environment development, after class, teachers can give students some music learning websites and software to help students to expand the knowledge of music learning at the same time, the online music community can attract many students love music, they can freely in the online community to present their view of music and works.

The blended learning environment is both real and virtual, face-to-face and remote. Through the integration of different classroom forms, the music classroom form will be transformed continuously.

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