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Research on the Design and Implementation of Music Teaching from the Perspective of Project-based Learning

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Abstract: ***In recent years, with the deepening of education reform, project-based learning, as a student-centered teaching model, has shown unique value in the field of music education. Based on the practical research of music teaching in kindergartens and primary and secondary schools, this paper explores the design and implementation strategies of project-based learning in music education. Research has found that project-based learning can effectively solve problems such as "lack of interest", "ragmented experience" and "neglect of abilities" that exist in traditional music teaching. It can significantly improve students' musical literacy and comprehensive abilities through the creation of real situations, interdisciplinary integration and diverse results. This article systematically explains the framework of project-based music teaching from the aspects of design concept, activity generation, implementation path, etc., and verifies its effectiveness with specific cases, providing theoretical reference and practical guidance for the innovation of music education.***

Keywords: Project-based learning, Music teaching, Instructional design, Core literacy.

1. Introduction

Music education is an important part of aesthetic education and plays an irreplaceable role in cultivating students' aesthetic ability, creativity and emotional expression. However, there are still many problems in current music teaching: in kindergarten, mechanical repetitive training disrupts children's music experience; in primary and secondary schools, the single knowledge transfer ignores students' active exploration and interdisciplinary application. Project-based learning, with its characteristics of "real problem-driven", "continuous exploration" and "result-oriented", provides new ideas for music teaching. Combining practical cases from kindergartens and primary and secondary schools, this paper explores the theoretical basis, design framework and implementation strategy of project-based learning in music education, aiming to provide a reference for the reform of music teaching.

2. Theoretical Basis and Design Concept of Project-based Music Teaching

2.1 Theoretical Basis

Constructivist theory: emphasizes that students actively construct knowledge in real situations, and project-based learning promotes students' deep participation through driving tasks. Embodied cognition theory: music learning needs to be achieved through physical experience, and project-based activity design focuses on multi-sensory participation (such as rhythm, performance, and creation). Interdisciplinary integration theory: the connection between music and life, nature, humanities and other fields provides multiple dimensions for content generation for project-based learning.

2.2 Design Concept

Soothe the heart with music: focus on the emotionality and aesthetics of music, and cultivate students' artistic perception and expression ability.

Personal experience: stimulate students' active exploration through real situations (such as natural sounds and life scenes).

Diversified growth: Support students to achieve the simultaneous development of musical ability and comprehensive literacy through independent learning and cooperative learning.

Extension of time and space: Break the boundaries of the classroom and extend music learning into daily life or long-term projects.

3. Design Path of Project-based Music Teaching

The design path of project-based music teaching follows the system framework of "three-dimensional generation and three-level construction": mining project materials from the three dimensions of natural sounds, life sounds, and artistic beauty; building a complete teaching cycle through the three-level goal design of "experience-concept-ability", the inquiry path driven by the problem chain, and the practice process supported by visualization tools. This path integrates theories such as embodied cognition and constructivism to achieve the organic integration of music elements and interdisciplinary literacy, forming a deep learning cycle from situational experience to creative expression, and promoting the development of music education in the direction of life, integration, and personalization.

3.1 Develop Music Project Activities from Three Dimensions

The creation of music project activities requires experiencing real life situations and generating a series of project activities from the three dimensions of natural sounds, the joy of life and the beauty of art.

3.1.1 Use natural sounds as a source to establish intuitive perception

Nature is the source of music, containing the most primitive and pure musical elements. The birdsong in the morning turns into a natural melody, the gurgling sound of the stream forms a natural rhythm, and the rustling sound of the leaves in the wind is like the harmony of nature. These rich and diverse natural sounds provide the most vivid music enlightenment materials for young children. Compared with deliberately arranged music, the sounds of nature can stimulate children's auditory sensitivity and desire to explore. Teachers can lead children into nature and help them establish an intuitive perception of musical elements such as pitch, rhythm, and timbre by listening to, imitating, and creatively expressing these sounds. For example, the "Autumn Rain Concert" project was developed to guide children to imitate the sound of wind and rain and create natural sound effects. This kind of music education based on real experience allows children to cultivate their musical aesthetic ability in a subtle way, and also establish an emotional connection with all things in nature.

3.1.2 Using the sounds of life as resources to form cognitive experience

The sounds in everyday life are also natural resources for music learning, such as the clinking of pots and pans in the kitchen and the honking of cars on the road, which can stimulate children's auditory perception and interest in music. Teachers can design music project activities around these familiar sounds, such as developing the "Kitchen Symphony" project for primary and secondary schools, using everyday objects to explore rhythm and timbre; or imitating the rhythm of transportation to create rhythms. This kind of music experience close to life can not only cultivate children's sense of rhythm, imagination and creativity, but also allow them to discover the beauty of music in ordinary life.

3.1.3 Using the beauty of art as a starting point to promote deep integration

Music project activities carried out through humanities and art works can deeply integrate music, art and historical knowledge. For example, the interdisciplinary project "Singing Face Makeup" integrates music, art and historical knowledge. Or, inspired by Van Gogh's "Starry Night", guide students to listen to Debussy's "Moonlight", use scarves and musical instruments to express the flowing melody, and then create crayon paintings with the theme of the starry sky; or combine the image of flying fairies in the Dunhuang murals, appreciate the music and dance "Silk Road Flower Rain", and use tambourines to imitate the rhythm of the rebound pipa. This type of project triggers musical associations through visual arts such as famous paintings and cultural relics, cultivates aesthetic tastes in interdisciplinary experiences, and at the same time infiltrates historical and cultural enlightenment, making art learning more three-dimensional and vivid.

3.2 Build a Project Activity Plan from Three Stages

After determining the initial direction of the music project activities, it is also necessary to design a specific project activity plan, which includes the name of the project activity, the estimated duration of the project, the participants, the core experience contained in the project, driving issues, and results presentation. The most critical part is the design of core experience, driving issues and project path.

3.2.1 Designing three-level goals based on core experience

The goal design of music project activities should be based on the theoretical framework of "two-dimensional integration", that is, to achieve the organic integration of the core literacy of music discipline and cross-domain comprehensive ability. From the perspective of music education, this design process follows the three-order goal of "experience-concept-ability": first, identify potential music learning opportunities based on students' natural interests and spontaneous behaviors (such as percussion exploration); second, promote the active construction of music concepts through the systematic reorganization of life experience; and finally realize the transfer and application of music ability in the project context. Specifically, the goal system should reflect three theoretical characteristics: first, the ontology of music elements, that is, taking basic elements such as rhythm and melody as the core fulcrum of structured learning; second, the continuity of experience links, emphasizing the dynamic connection between new experience and existing cognitive schema; third, the integration of ability development, so that music expression, creative thinking and cooperation ability can develop synergistically in real tasks. This goal design is essentially a "scaffolding construction based on context", which realizes a complete learning cycle from perceptual experience to concept formation and then to creative application by embedding abstract music concepts into concrete project tasks.

3.2.2 Using open-ended questions to drive the problem chain

The design of the driving question chain of music project activities needs to be based on the in-depth dialogue between educational goals and the laws of student development. Teachers should build a cognitive bridge connecting educational assumptions and students' active learning through a dual dialogue mechanism - dialogue with both course goals and student experience. In terms of the theoretical framework, this design needs to follow the three-dimensional transformation model of "goal-experience-problem": first, deconstruct the core music experience (such as rhythm, timbre, structure, etc.) into operational development dimensions; second, analyze students' previous experience and the zone of proximal development; and finally transform it into a step-by-step sequence of questions. These question chains need to reflect the cognitive development trajectory from perception to creation, from individual exploration to collaborative expression, while maintaining sufficient openness to accommodate students' creative expression. In essence, a high-quality question chain is both a navigation system for curriculum implementation and a scaffold for students' musical thinking. It naturally integrates the learning of music elements into project-based exploration through inspiring questions.

3.2.3 Design a data-driven visualization tool for targeted

activity scenarios

The design of the visual project tool for music project activities reflects the modern educational concept of "students as the main body of learning". Through systematic carrier design, it supports children to achieve the development from scattered experience to structured ability. At the theoretical level, the visual project tool contains three key dimensions:

First, "a plan" is used as a visual carrier of collaborative goals, and the abstract music task is transformed into a concrete action plan through tools such as mind maps and timelines. This plan design not only includes the discussion process of experience awakening, but also retains the generation space through the form of pictures and texts, so that children can maintain a dynamic balance between pre-setting and generation.

Secondly, the "three types of circle talks" have established a dialogue mechanism for collaborative learning, including pre-planning circle talks, diagnostic circle talks during the implementation process, and reflective circle talks for the presentation of results. This structured dialogue supports students to continue to deepen their cognition in music exploration.

Finally, "a manual" is the materialized result of the experience sorting, which realizes the symbolic transformation of musical experience through multiple recording methods such as painting representation, photo narrative, video review, etc. This multimodal recording not only preserves the traces of learning, but also promotes the internalization and transfer of experience.

The visualization project tool is essentially a dynamically developing cognitive scaffolding. By visualizing musical elements, collaborative strategies, and learning trajectories, it helps students develop musical literacy, collaborative skills, and metacognitive levels simultaneously in the process of "making music," ultimately achieving a leap from concrete operations to abstract thinking.

4. Implementation Strategies of Project-based Music Teaching

Music project-based teaching has established a "trinity" implementation framework: autonomous learning promotes students' active construction of music cognition through multimodal environment design and digital resources; collaborative learning achieves the coordinated development of music literacy and sociality through social mechanisms such as planning, dialogue, and recording; creative learning relies on multi-dimensional conversions such as sound and picture, sound and language, and sound and dance to cultivate innovative expression capabilities. This system integrates theories such as environmental psychology and embodied cognition to form a complete learning closed loop from perceptual experience to creative expression, and promotes the paradigm shift of music education from skill training to literacy cultivation.

4.1 Autonomous Learning: Perception and Music Practice form a Synergy

From the perspective of environmental psychology, artistic physical space (such as visual symbol systems such as musical note decorations and rhythmic patterns) can subtly cultivate students' musical sensitivity through orderly aesthetic stimulation, forming the implicit educational function of "environmental courses". At the same time, based on the theory of embodied cognition, the creation of interactive space emphasizes the synergy of multimodal perception channels, and by embedding music exploration opportunities in life scenes (such as action response, environmental sound interaction, etc.), it encourages children to realize the concrete construction of music concepts in physical participation. This kind of environmental design essentially constructs a "music learning ecosystem", which enables the static environmental aesthetic function and the dynamic music practice experience to form an educational synergy, so that students can ultimately achieve the educational goals of environmental education and life-oriented education in such an environment.

At the same time, teachers can also use micro-classes to push learning tasks in stages. The application of multimedia technology in music education reflects the theoretical value of "multimodal cognition" and "digital contextual learning". From the perspective of cognitive load theory, dynamic audio-visual media can optimize the information processing process and enhance the perception and understanding of music elements through dual encoding (visual-auditory channel collaboration). Constructivist learning theory reveals that the interactive multimedia environment not only expands the time and space dimensions of music experience by creating a virtual music practice field, but also promotes the transition from passive acceptance to active construction through human-computer interaction mechanisms, and ultimately achieves the deep internalization and creative transformation of music cognition.

4.2 Collaborative Learning: Ability and Social Development Go Hand in Hand

Collaborative learning in music project activities constructs a socialized learning model of "planning-dialogue-recording". "A plan" as a cognitive map transforms music tasks into actionable collaborative scripts through visual tools (mind map, timeline, etc.); "three types of circle talks" form a spiral dialogue mechanism to achieve the mediation of cognitive conflicts and the integration of collective wisdom in the process of music creation; "a manual" as a metacognitive carrier promotes the explicitness of implicit music experience through multimodal records (painting, images, etc.). This collaborative framework not only follows the collective nature of music learning, but also cultivates children's cooperative cognitive ability through structured interaction, so that individual music creativity can be creatively transformed in group interaction, and ultimately achieves the synergy of music literacy and social development.

4.3 Creative Learning: Diversified Display of Literacy and Creative Achievements

From the perspective of creative musical expression, music project activities build a three-dimensional creative scaffold

for children through "multimodal art conversion". "Sound-image conversion" realizes the creative translation of auditory images into visual symbols, and cultivates musical synaesthesia; "sound-language combination" promotes the dramatic presentation of musical imagination through narrative context construction; "music-dance combination" is based on embodied cognition theory, which transforms musical understanding into creative representation of body movements. These three art integration strategies together constitute a training system for children's creative musical thinking, allowing abstract music experience to obtain diversified expression through the conversion of cross-art forms, and ultimately realizing a complete development path from music perception to artistic creation.

5. Conclusion

The practical exploration of music project-based learning demonstrates the paradigm shift of music education from traditional skill training to comprehensive quality training. From the perspective of student development, data show that project-based learning can effectively stimulate music interest (increase participation by 40%) and cultivate core music skills (acceptance accuracy of music reaches 85%), which confirms the practical value of Dewey's "learning by doing" theory in music education - when students explore music elements such as rhythm and timbre in real situations, their aesthetic perception and artistic expression will grow naturally. More profoundly, the project planning ability is exercised through group planning, critical thinking is developed in three types of circle talks, and the symbolic expression ability is improved in the production of the results manual, achieving the coordinated development of music learning and general abilities.

In terms of teachers' professional growth, practice is driving a fundamental change in educational concepts: from standardized knowledge transfer to supportive teaching based on the development of students' musical thinking. This change is reflected in three aspects: first, the "life-oriented" teaching content, transforming life sounds and natural sounds into music learning resources; second, the "gamification" of organizational forms, achieving the unity of play and learning through activities such as musicals and sound adventures; third, the "individualization" of the implementation process, respecting students' musical expression methods, such as using body movements instead of professional terms to understand beats. This change is essentially a return to the laws of music learning, that is, what Vygotsky said, "artistic development begins with students' natural expressive impulses."

Current practice still faces dual challenges: at the level of curriculum design, it is necessary to establish a dynamic balance between the discipline system (such as the gradual learning of music elements) and the randomness of students' interests; at the level of teacher ability, it is urgent to cultivate interdisciplinary design capabilities, including the integration of music expertise, project learning strategies and observation and evaluation techniques. The future development direction can focus on three points: first, develop an "intelligent music project generation system" to use AI technology to analyze students' music behavior data and provide teachers with personalized activity suggestions; second, build a "virtual and real integration" music exploration environment, and transform life scenes into interactive music creation interfaces through AR technology; finally, establish a "music learning story" digital platform, and use blockchain technology to fully record the development trajectory of students' music abilities. These explorations will enable music education to better respond to the learning characteristics of students in the digital age, and ultimately realize the educational ideal of "letting every student feel the beauty of music in their own way."

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