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Developing a Thinking Type of Classroom Teaching for Music Auditory Training

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Abstract: *Auditory thinking is a complex psychological process, where the objectives, materials, and processes of musical auditory training all contribute to the thinking type of classroom teaching. This paper takes reading music and playing with singing as training content, guided by the cognitive instructional theory of "motivation activation—cognitive conflict—autonomous construction—self-monitoring—application transfer" and analyzes the specific requirements for identifying cognitive conflicts and promoting cognitive transfer, aiming to enhance auditory thinking quality by constructing a thinking type of classroom teaching that fosters cognitive development.*

Keywords: *Thinking type of classroom teaching, Music auditory training, Construction*

1. Introduction

Music auditory training involves many complex auditory information processing tasks, such as distinguishing musical elements such as pitch and timbre through auditory perception, improving visual symbol information processing through note recognition, rhythm visual reading, and other tasks, and promoting audio-visual integration of music information through sight singing and polyphonic perception. The fundamental attributes of musical auditory training are dedicated to enhancing the quality of auditory thinking, addressing both technical and artistic challenges in the processing of acoustic information. This attribute indicates that musical auditory training aims to systematically grasp the operational logic of auditory thinking. The depth, agility, criticality, creativity, and logical coherence of thinking urgently require development and optimization through the construction of thinking-oriented classrooms.

2. Characteristics of Thinking Type of Classroom Teaching for Auditory Training

A common phenomenon in auditory training is that fleeting sound patterns prevent listeners from discerning their constituent elements, resulting in a chaotic perception of pitch, duration, layering, and structural organization. Although some individuals demonstrate excellent pitch perception when singing, and others experience diverse emotions while listening, these alone are insufficient to gauge the level of musical aural proficiency. Good music listening requires high-level thinking and refined thinking skills. Auditory thinking is the intrinsic cognitive mechanism [1] of music practice activities and the core focus of music auditory training. The cultivation of auditory thinking in music not only relies on individual participation in explicit music practice activities, but also on the continuous construction of their implicit auditory perception in music practice.

The internal cognitive process of individuals absorbing, internalizing, and creating audio information to promote music understanding essentially confirms the process of auditory thinking in music and points to the steps of thinking teaching. The cognitive process of music auditory thinking should be deconstructed hierarchically and transformed into intuitive classroom teaching practice elements.

The construction of thinking type of classroom teaching centers on the dynamic growth of thinking, focusing on the progression of students' thinking levels from lower to higher orders and from simple to complex. The thinking type of classroom teaching aims to promote the development of students' thinking abilities as its core goal, emphasizing the transformation from a starting state to a certain target state through classroom teaching. It is a new form of classroom teaching that addresses the multiple challenges of the digital age. The development of thinking in the classroom can be reflected in the acquisition, expansion, transfer, and application of existing thinking skills to achieve deeper processing and more

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thorough understanding of knowledge.

In the thinking type of classroom teaching, learners either acquire new thinking skills, expand the application scenarios of existing thinking skills, or use existing thinking skills as means and methods to process knowledge, achieving a deeper understanding of subject knowledge and more proficient use of thinking skills, with a particular emphasis on "developing thinking abilities" rather than "simply applying existing thinking abilities".

The essence of music auditory training is to develop students' refined higher-order auditory thinking abilities through the construction of a thinking classroom. The goal of thinking type of classroom teaching for auditory training is to "develop thinking abilities" rather than "simply apply existing thinking abilities". Teaching activities serve as crucial settings for fostering cognitive development. By refining students' thinking into processes such as analysis, synthesis, abstraction, and generalization, the learning process enables precise skill-building and aligns the attributes of cognitive objects with corresponding forms of mental processing [2]. Enhancing students' auditory skills is achieved through a refined pathway of cognitive processing.

In auditory training, teachers should set driving tasks, construct diverse teaching paradigms based on music learning content, promote the transfer of thinking skills from the perspective of rich thinking teaching scenarios, diverse potential cognitive conflicts, and explicit thinking skills application, effectively stimulate students' learning motivation and attitude, develop students' music logical thinking, image thinking, and creative thinking, and elevate the "thinking classroom" to a "thinking development classroom".

3. Thinking Type of Classroom Teaching for Auditory Training Content

Training in multiple elements such as pitch, rhythm, harmony, and timbre all constitute auditory training. However, content that possesses the value of comprehensive training in “elements and the whole” is primarily developed in classroom training through sight-reading practice and singing while playing.

3.1. Sight-Reading Practice

Sight reading is a quintessential information processing activity—a complex cognitive process that translates musical notation into actual sounds and expressive interpretation. Far from mere note recognition, it constitutes a multi-layered, dynamic information processing activity involving a sequence of processes: visual symbol input, selective attention, working memory encoding, long-term memory retrieval, and motor response generation.

Sight reading trains students' auditory thinking skills through the encoding, storage, and retrieval of musical information. When the visual first comes into contact with the overall layout of the music score, this step will obtain preliminary information such as sheet numbers, keys, beats, structural markers, intensity and speed markers, and establish a preliminary impression of the basic emotional tone of the music itself; the second stage is the recognition and decoding of pitch, rhythm, and other notation elements, clarifying specific pitch positions and rhythm combinations, and synchronously identifying facial expressions, performance techniques, decorative sounds, temporary rising and falling signs, and their scope of action; the third stage involves integrating the aforementioned elements into coherent sound patterns, supplemented by musical understanding. Specifically, consecutive notes are organized into melodic lines, while simultaneously identifying vertical note combinations, perceiving their harmonic quality and function, discerning the patterns of rhythmic stress and release, and processing complex rhythmic patterns. By capturing the structure of the music itself through features such as repetition, comparison, and development, combined with information such as strength, speed, playing techniques, and expression terms, the object of thought is ultimately elevated to the level of musical understanding.

The output stage of sight reading involves mapping the integrated and understood musical information onto operational behaviors such as singing and playing. When the brain issues instructions to control the fingers or vocal cords to produce correct pitch, duration, timbre, dynamics and other results, this requires the prediction of auditory thinking, that is, the inner sense of hearing plays the role of expectation and feedback. Before the singing and playing operation, a person with rich auditory experience will "hear" the sound that is about to be produced in their mind and make real-time feedback and adjustments based on the actual sound produced to ensure that the singing and playing effect is consistent with the requirements of the music score.

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During sight-reading, the eyes continuously scan the music score, constantly acquiring new information. The brain continuously decodes and integrates this information, adjusting the ongoing overt actions accordingly. At the same time, the auditory system receives actual sound and compares it with internal auditory expectations and musical score requirements. If there is any inaccurate or unstable rhythm, it will be immediately fed back to the brain for correction. Sight reading is a highly complex, real-time, multi task parallel auditory thinking process [3] that requires solid music knowledge, sharp visual recognition ability, powerful information integration ability, profound music comprehension, precise action control ability, good internal hearing, and efficient attention allocation. This is a skill that requires long-term training to achieve mastery. Good sight reading ability is the foundation of music learning, and the entire process of sight reading is a continuous interactive process of close collaboration between visual, auditory, cognitive understanding, kinesthetic manipulation, and artistic expression.

3.2. Singing and Playing Training

For vocal accompaniment training, one must first possess auditory analysis skills. The subject of auditory analysis is fleeting sound patterns, and the non-semantic nature of these patterns renders music highly abstract. Only by deconstructing various elements in musical works, mastering their structural characteristics and creative techniques, and decomposing and analyzing melodies, harmonies, rhythms, textures, timbres, etc., can the occurrence and unfolding of auditory thinking form an objectified process.

Firstly, through sight reading, the content is sorted and classified, requiring students to accurately grasp the line changes of melody pitch fluctuations, especially the handling of off key modulations and out of chord notes that appear in the work should be given special attention. The accompaniment part is the identification of the texture structure and chord function. By judging the acoustic characteristics of the tonic chord and dominant chord, as well as other changing chords, it can roughly summarize the overall music tone and style of the work. In addition, mastering the structural characteristics of rhythm patterns, determining the rhythm center of different rhythm patterns, and capturing the sense of rhythm are also crucial for enhancing musical expression.

Secondly, we perceive sound through auditory perception. During the process of hearing music, our auditory system, aided by memory and imagination, develops the ability to retain and recall sounds. In the process of playing and singing, the distinction of timbre needs to be achieved through the contrast conversion of piano touch keys to enhance the emotional tone and establish the emotional tone of the music. Fine processing of timbre is one of the ways to improve the expressive and infectious power of music.

Creativity is the core of singing and playing training, which requires students to apply theoretical knowledge, singing and playing skills, and aesthetic perception of music to practical activities, while also expanding their imagination and developing innovative thinking. This not only places high demands on the reserve of theoretical knowledge, but also tests whether theoretical knowledge can be transformed into practical activities. In the initial stage of singing and playing activities, students can refer to accompaniment examples for textile adaptation, melody decoration, or filling. In terms of harmony arrangement, step-by-step training can be carried out, using different functions for the same fabric or matching different fabric layouts with the same chord, in order to understand how to use tonic chord and dominant chord to build the foundation of harmony arrangement, and how to enhance sound effects and emotional colors through secondary dominant chord and diminished chord. In the process of arranging accompaniment, appropriate chord progressions and texture forms should be selected based on different tonality, emotional tone, and stylistic characteristics. Fabric design should not only match the tonality and rhythm of the melody, but also enhance the artistic expression of the work through fabric changes, integrating implicit auditory activities with explicit operational behaviors.

4. Requirements for Thinking Type of Classroom Teaching for Auditory Training

4.1. Overall Requirements

4.1.1. Create a Problem-solving Scenario

Representative work cases are selected, and the problem context for auditory analysis is first set, which is the basis for the development of thinking. Secondly, setting goals for the thinking system that should be achieved in the classroom can be reflected in the acquisition of new auditory thinking skills, consolidation of known auditory thinking skills, and deeper processing of knowledge systems using

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existing thinking skills.

4.1.2. Identify Cognitive Conflicts Accurately

Cognitive conflict is the starting point and necessary condition for the development of thinking. When creating problem situations, valuable potential cognitive conflicts should be incorporated. Potential cognitive conflicts often manifest as contradictions between new and old knowledge, as well as students' different auditory skills towards the same problem. When creating problem situations, sufficient space should be provided for the exposure of these contradictions.

4.1.3. Visualize the Thought Process

Through sequential instruction [4], musical information is encoded, stored, remembered, retrieved, and reproduced. With the aid of cognitive tools, this series of implicit processes is made explicit [5]. In the process of deconstructing and constructing auditory knowledge in music, the sound forms in multiple levels are constantly undergoing a process of separation and integration driven by auditory thinking. The auditory perception of vocal part layering, harmonic tension contrasts, and the allocation of attention across different vocal parts [6]—all these correspond to processes of thought.

4.1.4. Promote Transfer of Learning

The shift in thinking reflects a transition in teaching objectives from emphasizing “explicit learning abilities”—such as knowledge and skills, comprehension and memorization—to prioritizing “implicit learning abilities”—namely, critical thinking and problem-solving skills [7], which represents a crucial indicator for enhancing the quality of thinking.

In the design and implementation of constructing a thinking type of classroom teaching, particular attention should be paid to three dimensions: making implicit thinking explicit, transforming explicit thinking into tools, and automating efficient thinking, which are the key points for promoting the internalization and transfer of thinking skills. Specifically, in the context of relatively fragmented knowledge, students should be guided to effectively organize fragmented knowledge using visualization tools. At the same time as generating the "knowledge panorama", it is necessary to clarify the position of specific knowledge in the panorama, which is fully reflected in the comprehensive training value of "element and whole" in music reading and singing training. Teachers should timely decompose complex tasks into several steps, guide students to complete them step by step, and ultimately improve their thinking quality through application transfer.

4.2. Specific Analysis

4.2.1. Sight Reading Practice

Sight reading is not simply visual recognition, but a complex cognitive process that involves multi-stage integration. It involves a series of processes such as visual perception, selective attention, short-term memory storage, long-term memory retrieval, information conversion, and reaction generation, as follows:

(1) Stimulus Reception and Selective Attention

Music score, as a visual stimulus, enters the visual receptors, and learners selectively focus on the relevant information areas on the score. For example, the current playing notes, rhythm patterns, diacritical marks, etc. require suppression of irrelevant visual information, and selective attention [8] is the basis for subsequent cognitive processing.

(2) Pattern Recognition and Feature Extraction

The visual information that is noticed, such as notes, rests, clefs, keys, beats, emoticons, etc., enters the sensory register for brief storage, and the pattern recognition mechanism begins to work. For example, the specific pitch name can be quickly identified based on the position of the note and in combination with the musical notation; it is possible to identify the duration of musical notes based on their combination forms, such as whole notes, half notes, quarter notes, eighth notes, etc., and to identify the rhythm type of several notes as a whole, such as dotted rhythms, syncopates, triplets, etc., and understand the time proportion relationship between them; it can also recognize strength marks, speed marks, playing technique marks, repetition marks, etc.

(3) Information Encoding and Short-term Memory

The identified discrete pieces of information require integration and organization. For example,

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continuously recognized notes are organized into a pitch sequence in order to understand the interval relationship between notes; the identified rhythm patterns are integrated into larger rhythm units, and the dynamic and structural characteristics of rhythm and beat are understood; emojis, intensity markers, and performance technique markers are meaningfully linked to their corresponding musical performance characteristics.

(4) Execution and Response Organization

Based on the pitch sequence, rhythm structure, and performance requirements constructed in short-term memory, students need to perform corresponding reading feedback. For example, the action program stored in long-term memory is called to match the current note to be read and the performance requirements; under precise temporal coordination, the action program is organized into a smooth sequence of actions in chronological order; during the execution of the action, the action plan is continuously monitored to ensure that it matches the actual expected effect.

(5) Feedback and Monitoring

Students complete the correction process through auditory, visual, and kinesthetic feedback, as well as error detection and strategy adjustment. Sight reading is a complex cognitive process that begins with visual perception, goes through selective attention, pattern recognition, information integration and sequence encoding, action program generation, and is accompanied by continuous feedback and monitoring to evaluate effectiveness, correct errors, adjust strategies, and promote learning [9]. The entire process emphasizes selective processing of information, structured integration, serialization operations, and goal based strategic monitoring and regulation. The collaborative operation of these internal cognitive functions is the result of the profound, agile, critical, creative, logical, and systematic operation of thinking.

4.2.2. Singing and Playing Training

Playing and singing works are an organic combination of melody, rhythm, harmony, and texture, so the analysis of the works directly affects the objectification of auditory thinking activities. The analysis of melody can clarify the ups and downs, development motivations, and sentence divisions of musical phrases, highlighting the overall subjectivity and coherence of the work; analysis of harmony enables more logical harmonic progression and accompaniment arrangement; analysis of rhythm facilitates precise control over rhythmic changes; analysis of texture allows for the use of different textural forms to enhance the expression of the melody. By separating and integrating musical elements, students can more efficiently solve technical and expressive problems in singing and playing training, thereby achieving implicit auditory thinking in the process of singing and playing, as follows:

(1) The momentary retention of musical elements. This is the starting point for individuals to continuously recognize musical elements in the process of sound form operation, and also the starting point for the coordination of the external operation of playing and singing.

(2) Identification and discernment of musical elements. Pitch, mode, rhythm, and beat are all basic elements that make up music. The recognition of various musical elements, especially the sense of mode and beat, is of paramount importance. The sense of mode knows the relationship between pitch and height, while the sense of beat knows the relationship between time. The two are prerequisites for distinguishing the relationship between pitch and rhythm, and are also key points for obtaining preliminary auditory concepts through playing and singing operations.

(3) Music memory. When individuals perceive sound, music memory is an important basis for mobilizing thinking for recognition and analysis, and is the fundamental condition for cultivating internal sound analysis ability. During the process of playing and singing, music memory will continue to play a role, allowing the sound form to expand continuously in both horizontal lines and vertical space.

(4) Transfer ability. Individuals consciously compare and analyze the current clip with the music patterns in their memory, and use this to build a bridge for collaboration with singing and playing. Transfer ability usually plays a significant role in training in music style comparison, distinguishing similar phrases, and assessing harmony function.

(5) Anticipation ability. This is one of the higher-order thinking abilities that auditory training aims to cultivate, which is usually applied in the perception of harmony function, recognition of works, and improvisation. Students are required to predict music development based on experience, transform their internal auditory thinking into forward-looking music understanding and creativity, which is also a common auditory psychological activity in singing and playing operations.

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5. Conclusion

The constructivist teaching theory is based on the fundamental principle of "motivation-cognitive conflict-autonomous construction-self-monitoring-application and transfer" [10]. The teaching activities of a thinking classroom are not only about teachers imparting knowledge in the classroom, but also the combination of the teaching process of teachers and the learning process of students. The core task in teaching and learning activities is to focus on thinking activities and improve thinking quality. Auditory thinking is a complex psychological process. The cognitive objectives, cognitive materials, and cognitive processes of musical auditory training all point toward the construction of a thinking-oriented classroom.

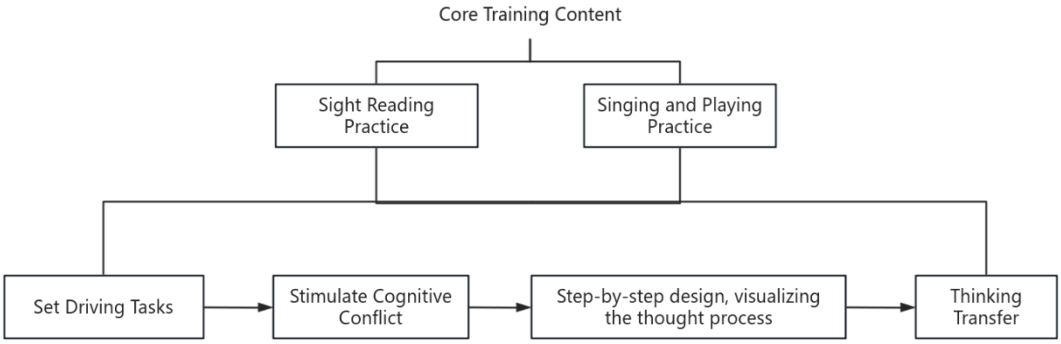

Figure 1: Auditory Training and Cognitive Construction.

As shown in Figure 1, this article focuses on reading music and singing as training content, demonstrating the specific requirements and processes for identifying cognitive conflicts and promoting thinking transfer, in order to construct a thinking classroom that can develop and optimize the depth, agility, criticality, creativity, and logicality of auditory thinking qualities.

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