A study on the Cultivation of Musical Mind's Ear in Sight-Singing and Ear-Training Teaching

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Abstract

The objectives of this research were to mainly in exploring how to cultivate and develop students' mind's ear in sight-singing and ear-training classroom teaching, in order to improve their music perception and comprehension.

The research method is qualitative methods by Literature method and Observation method Qualitative research is the analysis and research of mainly in exploring how to cultivate and develop students' mind's ear in sight-singing and ear-training classroom teaching, in order to improve their music perception and comprehension.

The research results found that: 1) the concept of the mind's ear involves perceiving and understanding music through mental imagery rather than actual sound input. It is based on the reproduction of musical memories in the brain, allowing individuals to "hear" music clearly in their minds. This form of listening experience is crucial for musicians and composers, as exemplified by Beethoven who composed his Ninth Symphony despite being deaf, showcasing the power of a well-developed mind's ear rooted in musical training and memory re-creation, 2) The cultivation of the mind's ear is essential in music learning and performance, enhancing the understanding of musical works, sensitivity, and expressiveness,3) The relationship between sight-singing, ear training, and the mind's ear is interdependent and crucial in music learning. Sight-singing and ear training enhance musical perception by focusing on accurate scale and rhythm reproduction, aiding in a precise understanding of music elements, 4) Cultivating the mind's ear approach and method in sight-singing and ear-training instruction, the importance of developing the mind's ear in sight-singing and ear-training using methods such as silent singing, recite singing, writing from memory, filling and continuing exercises, and combining memory with creativity.

Keywords: Mind's ear; Music education; Sight-singing and ear training

Introduction

Music is an art that needs to rely on the sense of hearing, and it needs to transmit the musical elements to the audience through the recreation process of the performer's playing and singing. And in the process of creating musical works, as well as playing and singing them, musicians do not only rely on external instruments and sounds, but more importantly on the ability to shape musical images in the brain through imagination, an ability that we call Mind's Ear. cultivating and developing the mind's ear in the sight-singing and ear-training classroom is also an important task in music education. Sight-singing and ear-training is a compulsory basic course for music learners, and the fundamental purpose of students' learning sight-singing

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and ear-training is to organize and develop their musical hearing, and to train and actively apply their hearing to composition and performance practice. However, in the author's actual teaching, I found that when the teacher asked students to sing chords without relying on the piano and other musical instruments as an aid or to carry out creative activities such as harmonic arrangements, students feedback that it is difficult to carry out the above activities without the aid of musical instruments, and that even students with an absolute sense of pitch believe that they need to rely on the piano to sing out loud or to play out loud in order to confirm that the chords and harmonies that they make are correct (Jeong-Hee & Aaron, 2017).

Even if a preset wrong note can be discerned from the chord being tested, this is simply the result of a reaction to enough practice rather than the result of generating the corresponding correct chord sound in your head and then comparing it.This phenomenon suggests that students are not actually able to form concrete sound images in their hearts and minds, which will undoubtedly pose a limitation for them to engage in higher-level music performance and music creation activities in the future. In order to help students develop their mind's ear and thus improve their musical ability, this paper will discuss a series of ways to cultivate the mind's ear, which will hopefully help students improve their sight-singing and ear-training ability as well as develop their musicality. (Nico, 2020).

As music education continues to deepen and evolve, we have come to realize that musical skills are more than just the mastery of instrument playing and singing techniques, but also the ability to perceive and understand music Previous studies have shown that the cultivation of mind's ear is of great significance to music performance and creation. However, there are still some deficiencies and limitations in the cultivation of mind's ear in the current music education system at home and abroad. existing problems include how to improve students' perception and comprehension of music and how to combine theory and practice. And sight-singing and ear-training is an important method of music education, which helps students develop their musical hearing and mind's ear ability. Mind’s ear is the ability to emulate musical sounds through the interior of the brain in the absence of external sounds. This ability is important for musical performance and understanding. today's research on the role of sight-singing and ear training instruction in the development of music's mind's ear is limited (Honing,2018).

In conclusion, the cultivation of the mind's ear is a crucial aspect of music education that enhances students' ability to perceive and understand music beyond mere instrumental proficiency. The mind's ear allows musicians to form concrete sound images in their minds, aiding in higher-level music performance and creation activities. While sight-singing and ear-training serve as vital components in developing the mind's ear, existing challenges include improving students' musical perception and comprehension and bridging the gap between theory and practice. Addressing these issues is essential for enhancing students' musicality and overall musical abilities.

Research Objective

To mainly in exploring how to cultivate and develop students' mind's ear in sight-singing and ear-training classroom teaching, in order to improve their music perception and comprehension.

Literature Review

Music is the art about sound, and for those who make a career out of music, a good mind's ear for music is an indispensable ability in music composition, music performance, and so on Mind's ear has also long been a topic of study for many music educators and performers. Hearing is an objective and basic physiological condition of an individual. Musical mind's ear is the ability to produce a variety of sounds in one's mind without the aid of an actual musical instrument, and to reproduce them in one's brain in the form of musical auditory expressions (Wang, 1997).

In the study of mind's ear, Bruce-Adophe, a leading contemporary American composer, educator, and performer, wrote and published by the University of Oxford in 2013 the book The Mind's Ear the book is a guide to teaching exercises designed specifically for the development of musical imagination, by guiding readers to first construct and imagine the timbre of various life scenarios in their mind's ear from real life, and then progressively to construct and imagine the timbre of various instrumental sounds related to music, through which a series of exercises will strengthen musical imagination and inspire creativity, aiming to improve the ability to read and imagine music without sound, i.e., the mind's ear as the author suggests. This is a very inspiring book, not only for musical ability but also for imagination (Miu, 2000).

On the Cultivation of Inner Musical Hearing in Sight-Singing Teaching, that the human mind's ear perceives sound not only passively by accepting external stimuli but also actively by anticipating the attributes of the sound that may occur. This psychological expectation is influenced by experience and learning on the one hand, and on the other hand it shows a psychological tendency towards musical creativity. In music learning, we call this kind of mental characteristic mind's ear (Wang, 1997). The cultivation of mind's ear is an important task in the teaching of sight-singing and ear-training, and as an important musical listening ability, mind's ear needs to be formed gradually through repeated practice. Song Chao explores the principles of the formation of mind's ear in A Primer on the Principles of Musical Mind's Ear, systematically explaining everything from the level of the human physiological hearing mechanism to the principles of the cultivation of mind's ear, facilitating the reader's detailed understanding of the mechanism of the operation of mind's ear (Ostrovsky & Sun, 1957).

In Three Forms of Mind's Ear, the three forms of inner rhythmic sense, inner melodic sense, and inner harmonic sense, which exhibit different mental characteristics during musical time activities as a study. Rhythm, melody and harmony are the three main elements that make up music. By analyzing the qualities of these three elements, the author emphasizes that they are an inseparable whole, and that in the cultivation of the mind's ear, one cannot abandon one and talk about the other alone, and that only by having a rich experience in perceiving the sound of music in all three can one truly comprehend the music, and then perform and create music.

Research Methodology

This study is qualitative in nature and methods used are:

1. Literature method: a research method to find out the essential attributes of a thing through reviewing, analyzing and organizing the literature. Through literature research in the direction of music education and the direction of sight-singing and ear-training teaching, a scientific understanding of the phenomenon of music education is formed, which helps to guide further teaching practice in the classroom.

2.Observation method: observation method is a method of purposeful and planned observation of observable objects under natural conditions, collecting and analyzing perceptual information of the bookstore. Observation method has an important role in educational science research and is the basis of the research method of sight-singing and ear training pedagogy. Through observation, it helps the researcher to obtain the real process of sight-singing and ear training education and teaching, helps the researcher to understand the status of individual differences in the musical quality and musical potential of music education subjects, and enables the researcher to find ways to answer various questions in sight-singing and ear training teaching.

Research Conceptual Framework

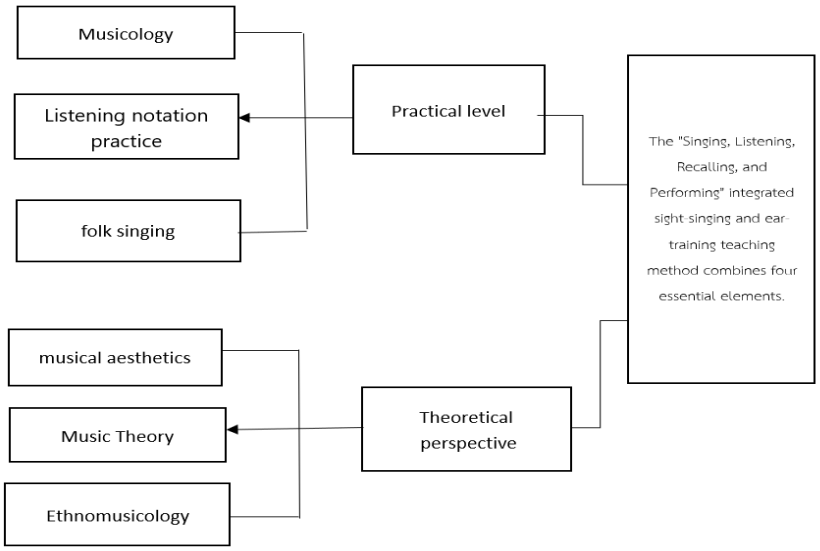


Figure1 Research Conceptual Framework

Research results

1. The concept of mind's ear and the principles that give rise to it

1.1 The concept of mind's ear

The famous music educator A.L. Ostrovsky (А.Л. Островский) has explained mind's ear as follows, "Mind's ear of music is based on the musical imagination or the reproduction in memory of images from the heard piece. This is where the musical imagination differs from the auditory apprehension constituted by the direct action of the score. This explanation of his reveals the nature of mind's ear, i.e., the mobilization of the reorganization and re-creation of musical memories in the brain.

Mind's ear refers to perceiving and understanding music through mental imagery rather than actually hearing the sound. When we recall the melody, rhythm, harmony, and other elements of music in our minds, although there is no actual sound input, we can hear these musical elements clearly through mental imagery, and this kind of listening experience is mind's ear. for example, by listening to music, reading music scores, analyzing musical works, and receiving auditory and visual stimuli, we can help build a model of music in our brain, leaving a musical impression and memory, after which we can clearly "hear" music without actual sound input. The reason why Beethoven was able to write his famous Ninth Symphony in his later years when he was completely deaf was because he had received strict musical training since he was a child, and had a good mind's ear, and was able to create an heirloom classic by virtue of this superb mind's ear even when he was completely deaf.

1.2 Principles of mind's ear generation

Hearing is a prerequisite for the existence of music, so only a thorough physiological understanding of hearing can lead to an understanding of the many aspects of musical behavior. To understand the principle of the generation of mind's ear, we should first understand how hearing is generated. First of all, we should first be clear about the mechanism of operation of physiological hearing - the human hearing organ is the ear, and the structure of the human ear is divided into the outer ear, the middle ear, and the inner ear. The outer ear consists of the auricle and the external auditory canal, which are visible to the naked eye. The middle ear is separated from the inner ear by the eardrum, behind which there is the auditory ossicles formed by the hammer bone, the anvil bone and the stapes bone, as well as the eustachian tube and the tympanic chamber. The inner ear includes the cochlea, vestibule and semicircular canals, and the auditory nerve is connected to the inner and outer hair cells of the cochlea. Sound is collected by the auricle through the external auditory canal to reach the tympanic membrane causing mechanical movement of the auditory ossicular chain, and the vibration of the stapes floor plate causes movement of the vestibular window energy is transmitted to the internal and external lymphatic fluids in the cochlea, which turn into fluid vibration. afterwards, the movement of hair cells on the basement membrane generates bioelectrical activity, and nerve impulses pass through the auditory nerve, uploaded to the neural pathway and finally reach the center of the auditory cortex to produce hearing. music is a momentary art form that consists of sounds organized over a period of time. It is impossible to think of musical cognition in isolation from the temporal element, and therefore memory must play an important role in it. Today's theories often divide human memory storage into two main types: short-term memory and long-term memory. Short-term memory has limitations in terms of duration and capacity, and information in short-term memory begins to fade away after about thirty seconds, unless it can be repeated at certain intervals. Long-term memory, on the other hand, has a virtually

unlimited capacity, and can contain memories of events that occurred decades ago, as well as storing memories that were formed minutes ago. When the above memory theories are applied to musical situations, it becomes clear that short-term memory is often actively involved in storing new, previously unheard melodies, whereas long-term memory stores the melody's pitch contours, tonal characteristics, and other characteristic schemas that make up the melody, making these melodies more and more familiar to our minds.

Regarding the principle of mind's ear, Wang Guangyao, a famous Chinese musician, believes that "mind's ear is the accumulation of inner musical images formed under long-term, intentional or unintentional external acoustic stimulation, and it is a kind of imaginative ability of musical images. Mind's ear for music is the mental process by which old sound images are reprocessed and transformed by the brain to form new sound images."(Wang Guangyao. 2008. A Collection of Essays on Teaching Methods of Sight Singing and Ear Training. Taibai Literature and Art Publishing House. 164) This point of view explains the formation process of mind's ear, i.e., through long-term, conscious memory of external sound, the brain gradually forms an accumulation of internal images of music, and eventually forms an ability to imagine musical images.

2. The significance of the cultivation of mind's ear

Mind's ear plays an important role in music learning and performance, helping us to understand musical works more deeply and to improve our sensitivity and expressiveness. Developing the ability to mind's ear means building in the brain the ability to accurately reproduce the elements of music, which not only helps us to learn, play and compose music better, but also helps us to understand and express the essence of music. in addition to its importance to music learners, mind's ear has a wide range of applications in music education. Teachers can help students understand and feel music better by guiding them to develop their mind's ear skills. In addition, mind's ear can be used to assess and diagnose a student's music perception and comprehension skills so that they can be provided with individualized instructional programs.

3. The relationship between sight-singing, ear training and mind's ear

The Relationship Between Sight-Singing and Mind's Ear Essentially, sight-singing and ear training focuses on improving learners' musical perception through a series of musical exercises, such as singing scales and rhythms accurately, as well as providing correct auditory feedback on the music. In the process, learners gradually develop a precise perception of music, including elements such as pitch, rhythm, and timbre. This ability to perceive with precision enables us to understand and experience music in a more nuanced and in-depth way. Yet this perceptual ability is not limited to the direct perception of musical sounds; at a deeper level, it also includes the imagination and understanding of musical acoustics, which we often refer to as mind's ear. This is a deeper level of perceptual ability that requires the learner to be able to introspect and perceive music without the actual sound of the music. It is an abstract musical perception which requires the learner to have a deep understanding and mastery of the elements of music in order to realize it.

The improvement of mind's ear ability, in turn, facilitates the learning of sight-singing and ear training. When learners are able to accurately visualize and understand musical sounds, they will be more likely to grasp pitch, rhythmic harmony, melody, and other elements in their sight-singing and ear training. This grasp is not simply imitation and

memorization, but is based on an in-depth understanding of the music's acoustics, which is transformed into an internal auditory experience. Such an approach to learning will result in a significant improvement in the learner's sight-singing and ear-training skills. In the author's opinion, sight-singing ear training and mind's ear are in a mutually reinforcing relationship. On the one hand, through the training of sight-singing and ear training, we can enhance our inner mind's ear ability; on the other hand, the enhancement of inner hearing in turn enhances our sight-singing and ear training skills. This is an enhancement of inner musical perception, which enables us to better understand and experience music.

So, the relationship between sight-singing and mind's ear is a complementary process. Together they form the cornerstone of music learning, helping us to understand and experience music in depth. Through continuous training and enhancement, we can better master the various elements of music and thus gain deeper experience and realization in the world of music. Therefore, it is very important for every music learner to understand and master the relationship between the two.

4. Cultivating the mind's ear approach and method in sight-singing and ear-training instruction

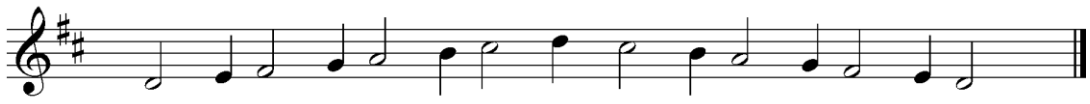
In the sight-singing and ear-training teaching to cultivate listening to the more mind's ear in a variety of forms and methods, now according to the author in the teaching of the main methods used to explain the following.

4.1 Singing in silence

The so-called silent singing refers to the ability to sing in the mind without making a sound based on the mind's ear; it is the ability to reproduce music or sound in the mind without making a sound. This form of training can be done by looking at the score and singing only some of the notes without sounding the others, or by looking at the score without sounding it and singing all the notes in your mind. In the initial stage of silent singing training, the mind's ear may be vague, but as the training progresses, this mind's ear will become clearer and more certain, which is the process of generating and strengthening the mind's ear.

Singing scales in silence：

Score1



Score2

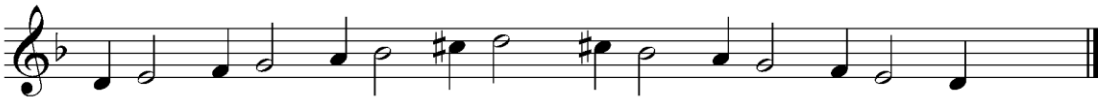
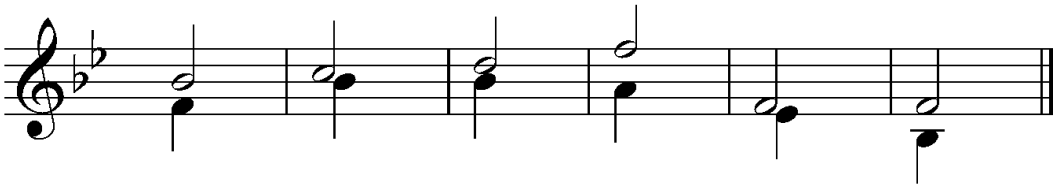


Figure: Singing scales in silence

The half note is sung audibly, the quarter note is sung silently, and when the last note is sung, the same note is played on the piano to test the accuracy of the sung scale. It is also possible to play only the first and last notes of the whole scale, and then sing them silently, thus consolidating and strengthening the mind's ear of the tonal scale.

Singing intervals in silence：

Score3



Score4

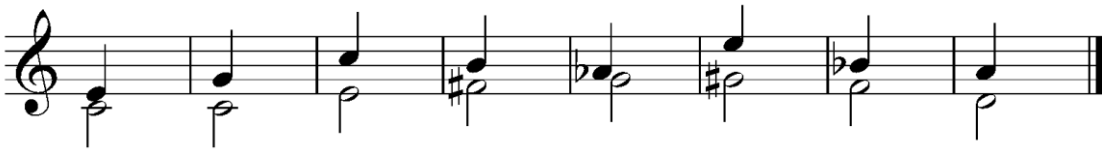
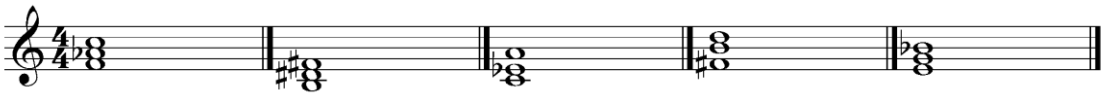


Figure: Singing scales in silence

Singing intervals in silence can be categorized into in-key interval and non-in-key interval for example, score 3 is a silent singing of intervals in a key, and the purpose of this silent singing is to develop a mind's ear for intervals within a mode, based on the key. On-in-key intervals

Singing in silence of chords and chord progression.

Score5



Score6

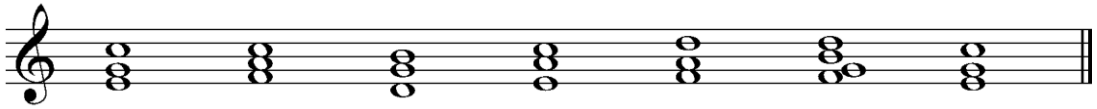
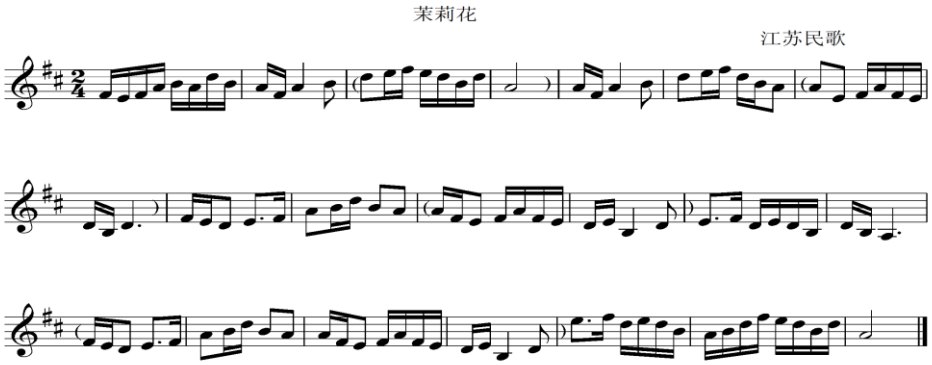


Figure: Singing in silence of chords and chord progression

To sing chords silently, you can play two voices on the piano and sing one voice, either in the original chord or in the inversion chord, singing a note in the chord internally and then playing the note to check the accuracy of the silence. Score 6 is the silent singing of three-part chord progression in a key. You can play two parts and sing the other part silently, paying attention to the sense of harmonic continuity. When you get good at it, you can play only a few chords and sing all the other chords in silence to develop the mind's ear for harmony.

Singing in silence of melody:



Score7

Figure: Singing in silence of melody

Score 7 is a well-known Chinese folk song "Jasmine Flower" in Jiangsu Province, with a melodious melody in A Zhi pentatonic mode, which is quite similar to the musical style of the south of the Yangtze River in China. It can be practiced in the form of vocalizing one line and singing one line silently, and in order to avoid boring practice, it can be practiced in small groups, or in the form of two-person pairs. Melodic silent singing is good for developing the mind's ear of melody. At the same time, because melody involves musical elements such as pitch, rhythm, key, tonality, etc., it is said that melodic silent singing plays a good role in promoting the improvement of students' comprehensive musical quality.

4.2 Recite singing and improvisational transposed recite singing

The so-called recitation singing is to choose a representative music classic work to read the music score and sing, analyze its structural characteristics, melodic characteristics, seize its characteristics, and then sing it by memory without reading the music score. a great deal of practice has proved that by recite singing can improve students' musical memory ability, which is closely related to the mind's ear of music. The stronger the music memory ability, the stronger the mind's ear, and conversely the weaker the music memory ability, the weaker the mind's ear. So, it is said that the improvement of music memory ability will strongly contribute to the development and improvement of music inner mind's ear. The works to be sung by heart can be vocal or instrumental. For example, the theme of the second movement of Czech composer Dvorak’s Symphony No.9 "From the New World" is very suitable as a material for recite singing.

Score8

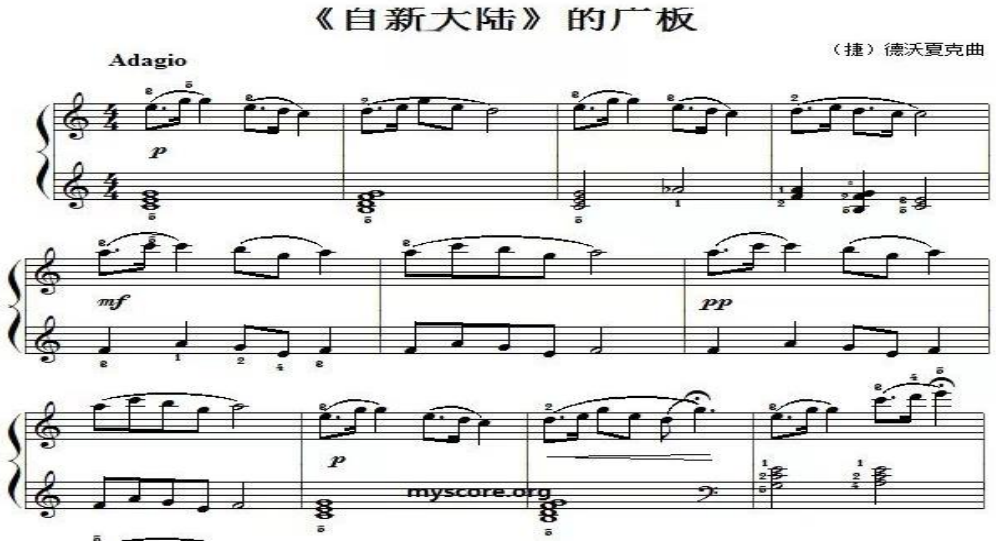


Figure: Score8

Improvisational transposed recite singing is based on memorization of the original tune, based on the inner feeling, in the selected new key quickly organized corresponding to the new tune for the transfer of the tune to recite sing. For example, the above score can be moved to the key of D and B-flat for reciting. This type of transposition singing reproduces the original tune on a new pitch and a new title without the help of vision, only by virtue of the mind's ear's tonal impressions. It presupposes familiarity with the key of the original tune and an autonomous mastery of the tonality of the new key. Instead of leaving too much time for reflection, students are asked to react quickly and accurately recite singing based directly on their impression of the original pitch, thus having a certain improvisation, which has a better effect on the development of the mind's ear.

4.3 Write from memory

Write from memory is essentially writing on a memorized melody without looking at the score; it requires a more precise understanding of the piece and the ability to record it in detail. The ability to memorize music is strengthened through write from memory, and a large and varied musical language is accumulated, laying the foundation for future compositions. Write from memory also improves students' ability to music notation. In another way, write from memory is also a way for students to truly realize how to translate their mind's ear into a visual musical notation process. A good composer, in many cases, composes with his mind's ear by reconstructing and combining various musical elements, creating a new musical image, and exporting it in the form of a written score to form a work.

4.4 Filling and Continuing

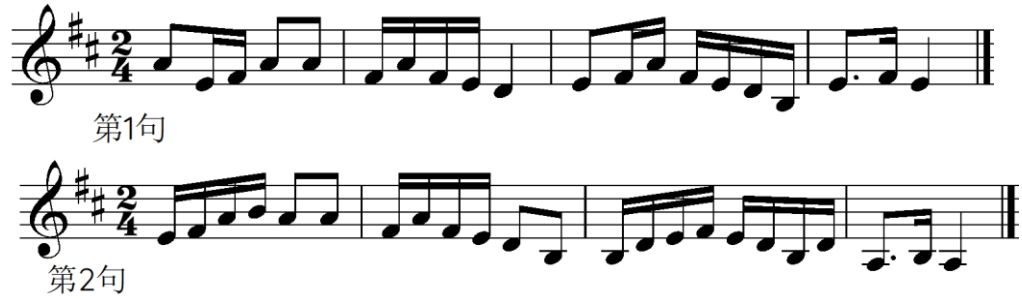
The teacher sings or plays a piece of music on the piano, then writes the beginning, middle, and end of the piece on the board, and then the students fill in the gaps that the teacher has set aside based on their musical memory of the piece. May students only listen to the music once and cannot fully remember the vacant part of the melody, the teacher can repeat and then sing or play again, but to strictly control the number of times to singing and playing, to mobilize

the students' enthusiasm to strengthen the memory of the vacant part, as a way to cultivate the students' ability to remember. The fewer times the piece needs to be played the more the student's memory improves. It is also possible for the teacher to write out only the beginning part of the piece and have the student take over and complete the second half of the piece. The length of the piece can be four, eight, or twelve bars, and the general principle is from short to long and from easy to difficult.

4.5 Memory and Creativity

The practice of this training method is as follows: first, the teacher plays an upper phrase on the piano, the student quickly memorizes the first phrase, and according to the melodic style, structural characteristics, and melodic characteristics of the first phrase, he or she quickly creates an echoing second phrase internally, and plays it on the piano. The method of this exercise tests the student's ability to memorize and understand music quickly, and to rely on their inner ear to quickly organize the musical language to create the next phrase. This creative style of exercise is very effective in developing the student's mind ‘s ear for music and fostering creativity. Here are two examples of different styles:

Score 9



Score 10

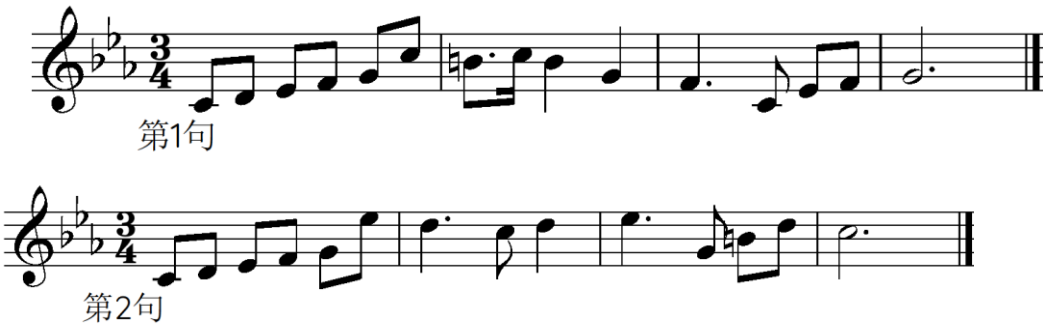


Figure: Score 9

The answer to the next phrase that comes out of this improvised practice pair is not unique. The teacher plays a first phrase, and different students can create different next phrases. As long as the style is similar and the melody develops logically, it can be determined as the correct answer. It is such challenging exercises that can greatly motivate students, encourage them to actively explore and discover, and thus stimulate their mind's ear and enrich their musical thinking.

The above are the training methods for developing mind's ear that I often use in my teaching practice activities, and these methods have been proven to be effective through teaching practice. Of course, there are many other ways to cultivate the mind's ear in the teaching of sight-singing and ear training. For example, the practice method of listening to the sound while reading the score, the practice method of comparing the written work with the sound work, the practice method of reading the score in four-part harmony and imagining the sound in silent reading, etc. In short, we need to tailor our teaching to the student and use different practice methods according to the student's specific situation in order to cultivate and develop the student's mind's ear.

Discussion

The result found that musical mind's ear is the accumulation of inner musical images formed under external acoustic stimuli; it is an ability to visualize musical images. music mind's ear is the psychological process of reprocessing and transforming the old sound image through the brain to form a new sound image (Ostrovsky & Sun, 1957). Mind's ear plays an extremely important role in the process of understanding music, music performance and music creation. The cultivation of mind's ear is an important task in the teaching of sight-singing and ear training. As an important musical listening ability, mind's ear needs to be gradually developed and improved through repeated practice and realization. Teachers in the sight-singing and ear training teaching process, according to the actual situation of the students, to take a variety of forms to cultivate and develop students' music mind's ear (Miu, 2000).

Synthesize the overall finding as the new knowledge The research has established that cultivating and developing students' mind's ear in sight-singing and ear-training significantly enhances music perception and comprehension. Key findings include:

1) The mind's ear involves perceiving music through mental imagery, crucial for musicians and composers.

2) Cultivating the mind's ear is essential in music learning and performance, improving understanding and expressiveness.

3) Sight-singing and ear training are pivotal in enhancing musical perception and understanding.

4) Methods like silent singing, recite singing, writing from memory, and creativity exercises are effective in developing the mind's ear during sight-singing and ear-training instruction.

This knowledge underscores the importance of integrating mind's ear development strategies into music education to enrich students' musical abilities.

Suggestion

1.General suggestion

This article proposes the fusion of diverse musical heritages, encompassing both Western and non-Western music, to provide students with exposure to varied tones, scales, and melodic forms. It highlights the importance of comparative analysis by encouraging students to juxtapose different musical styles, focusing on both their similarities and differences concerning melody evolution, harmonic advancements, and rhythmic arrangements.

2. Suggestion for future research

In upcoming research endeavors, a call is made to actively involve individuals in practical activities like mimicry, spontaneous music creation, and performance across various musical customs. Such engagements aim to foster direct comprehension of a broad spectrum of musical idioms while offering insights into the historical and cultural contexts underpinning the studied music. By introducing the concept of "bi-musicality," students can be guided effectively towards cultivating a comprehensive understanding and admiration for diverse musical traditions through vocalization and attentive engagement.

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