INTERDISCIPLINARY LESSON PLANS FOR TEACHING MANDARIN AND

MUSIC TO ELEMENTARY SCHOOL STUDENTS

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The purpose of this practicum was to create 10 lesson plans that use music to teach musical skills while also fostering Mandarin pronunciation, listening comprehension, and syntax. A review of previous literature indicated a connection between music and language learning and highlighted possible teaching strategies that were utilized in the current project. The development of the plans was also informed by interviews with one elementary school music teacher and one elementary school Mandarin teacher respectively, and observations of one music lesson and one Mandarin lesson in the same school. Best practices from previous research, standards for music and Chinese language learning, and information from teacher interviews and observations all contributed to the 10 lesson plans that focused on learning both beginning Mandarin and music skills. The practicum concludes with a summary and implications for future research. Some of these implications include developing more age-appropriate resources for music and Mandarin interdisciplinary courses, and examining the effectiveness of such lessons via an experimental study.

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Chapter 1: Statement of the Problem

Rationale

Music learning and language learning share common attributes, and researchers have revealed the connection between these two areas. From linguists' and music educators' perspectives, music training may benefit language learning. Ray (1997) designed a music-driven English curriculum and tested the effectiveness of the curriculum in an elementary school with a predominantly Latino population. She found that all participants from Pre-k, Grade 1, and Grade 2 increased their English level of communication after receiving two weeks of daily ESL music lessons.

Likewise, Li and Brand (2009) used American and British pop songs in a college level ESL class in China. The comparison of three groups' English achievement (whole music group, half music group, and non-music group) showed that consistently using songs in the ESL class could significantly improve participants' English vocabulary and usage as well as increase their motivation to learn a foreign language.

The effectiveness of using songs in a language class was also investigated by other researchers. Coyle and Gracia (2014) examined the influence of musical activities on young EFL students' vocabulary acquisition. After teaching the song *The Wheels on the Bus*, 25 Spanish children significantly improved their receptive vocabulary acquisition on the five targeted words (wheels, wipers, horn, door, and bell). Davis and Fan (2016) devised their research protocols based on previous studies and added a control condition to their experiment. They investigated the effect of songs and choral repetition on English vocabulary acquisition. The results indicated that participants significantly improved their acquisition on those English phrases taught under the song and repetition conditions.

Vera and Luna (2013) also proposed a multimodal teaching plan, and they gave some specific examples of teaching music and foreign language at the same time. For example, they taught children the song *Old MacDonald* while showing them animal flashcards, and the teacher would first adjust students' intonation and rhythm accuracy. After that, the teacher said the name of different animals, and children had to make the corresponding sound as to consolidate memory of the vocabulary.

Psychologists and neuroscientists have also found that music instruction may have a positive effect on processing different linguistic tones. Marques, Moreno, Castro, and Besson (2007) conducted research on French musicians and non-musicians' ability to detect pitch variations in Portuguese. The result showed that musicians were more successful in detecting trivial differences in a foreign language, and musicians could process and categorize the same and different pitches much faster than non-musicians. Therefore, they stated that music instruction improved pitch processing in music and language domains. Wong, Skoe, Russo, Dess, and Kraus (2007) examined musicians' and non-musicians' brainstem response to different linguistic pitches. The result of this study showed that compared to non-musicians, musicians had stronger linguistic pitch encoding at the brainstem.

Some researchers have found specific connections between tonal language and musical abilities. Mandarin is a tonal language with four different tones. The meaning of a word changes when pronounced with different tones. For example, "shu" pronounced in the first tone could mean "book"; pronounced in the second tone could mean "ripe"; pronounced in the third tone could mean "count"; and pronounced in the fourth tone could mean "tree". Researchers have investigated the effect of tonal language background on

music pitch perception and production (Deutsch et al., 2006; Peng et al., 2013; Pfordresher & Bowen, 2009). Deutsch et al. (2006) found that Chinese music students from Central Conservatory of Music (CCOM) had better performances on the absolute pitch test than music students at the Eastman School of Music (ESM). While the beginning age of formal music training might affect the acquisition of absolute pitch, the Mandarin speaking background still led to higher opportunities for developing absolute pitch.

Peng et al. (2013) conducted similar research to investigate the influence of Mandarin speaking background on absolute pitch development. They invited 283 Chinese college students and 24 English speakers at the University of California San Diego to take the absolute pitch test. The procedure of the test was borrowed from Deutsch et al. (2006), and the result was consistent with the previous study, which indicated that Mandarin speakers (tonal language) had some advantages in acquiring absolute pitch over English speakers (non-tonal language).

Pfordresher and Bowen (2009) examined the relationship between tonal language and pitch processing in music. They recruited one group of Mandarin speakers and another group of English speakers, and asked them to take four tests: pitch imitation, interval imitation, pitch discrimination, and interval discrimination. The result showed that Mandarin speakers did better in the pitch imitation, interval imitation, and interval discrimination tests than English speakers.

Because the processes of music and language learning have so much in common, and may be mutually beneficial, it is logical to integrate these two subjects into an interdisciplinary curriculum. According to Klein (1990), the idea of interdisciplinarity was proposed many years ago. Plato supported the concept of integration of knowledge, but it

was not until the twentieth century that the word interdisciplinarity emerged. It was first used in general education and social sciences. In the early twentieth century, there were many programs incorporating the idea of interdisciplinarity. For example, the Social Science Research Council (SSRC) was founded in 1920s to endorse the integration of different subject matters. Entering the mid-twentieth century, there was a trend of promoting interdisciplinarity. Many experimental interdisciplinary programs were established in the 1960s and were affiliated with colleges and universities (Klein, 1990). The Association for Supervision and Curriculum Development (ASCD) reported in 1989 that according to the results of a poll, integration of curriculum was the top issue in American education (Jacobs, 1989). Throughout history, educators have explored the integration of disciplines, and the concept of interdisciplinarity has gained more and more attention from the public over time. As a result, it is reasonable to connect two subjects that share similar learning processes and provide students with a more holistic learning experience.

Interdisciplinary curriculum is theoretically based on a progressive educational system, which attaches great importance to students' creativity and their learning experiences (Ellis & Fouts, 2001). In a traditional education system, each course may have a clear goal and several predetermined steps; however, teachers of interdisciplinary courses often use loose planning that provides a general landscape and gives students time to explore and inquire (Barrett, 2016). An example of the progressive educational system was the Whole Language approach in music classrooms promoted by Whitaker (1994). "The Whole Language approach can be described as a research-based framework supporting many pedagogical choices, rather than appearing as a prescribed scope and sequence"

(Whitaker, 1994, p. 24). The purpose of this approach was to give students the experience of interactive learning, and it focused on students' participation and creation. For example, students may be assigned to a group, and members in the group work together to create short lyrics in English based on a given topic. Students then improvise a melody to fit the lyrics and then notate the melody. Through this approach, students can practice both the new language they are learning and music notation. They can also learn about rhyme and make connections between music and language contour as they compose a song with text. The goal of the interdisciplinary lesson plans is not simply to teach one subject but to allow students to use multiple senses and explore different curricular areas in one class. Therefore, combing music and language teaching may give students an opportunity to engage in reading, writing, listening, singing, and kinesthetic activities in the same course so as to develop both musical skills and language literacy.

The interdisciplinary lesson plans that were developed in this study followed certain standards for music teaching and Mandarin teaching, and focused on Mandarin communication as well as music making and performing. The Standards for Chinese Language Learning (2006) are categorized into five areas: communication, cultures, connections, comparisons, and communities. According to these standards, students are expected to communicate with the foreign language they learn and know the culture behind the language. In addition, they should be able to build connections in foreign language learning and other disciplines at school, compare the foreign language they learned with their native language, and use the foreign language outside the school settings. The National Core Arts Standards (2014) emphasize students' abilities in creating, performing, responding, and connecting. Through learning music, students should improve music

literacy and develop skills such as performing, analyzing, and connecting music to the social and cultural context from which it originates. Researchers have found that learning music may effectively improve students' language ability and their motivation for learning a second language (Eterno, 1961; Li & Brand, 2009; Luckett, 1996; Ray, 1997). The positive effect of tonal language speaking on pitch perception has also been examined by many researchers (Deutsch et al.,2006; Peng et al., 2013; Pfordresher & Bowen, 2009). However, despite the close relationship between music and language, especially tonal language, there is limited knowledge regarding teaching that combines music learning with tonal language learning.

Purpose Statement

The purpose of this practicum was to create 10 lesson plans that use music to teach Mandarin pronunciation, listening comprehension, and syntax. The goal of these lessons was to improve students' Mandarin communication skills and develop music skills simultaneously. The lesson plans were designed for beginning level Mandarin students in elementary school, and followed the Standards for Chinese Language Learning (2016) and National Music Standards (2014).

Research Questions

This practicum investigated the following questions:

1. What standards are addressed in teaching Mandarin in a beginning level class?

2. What possible teaching sequence(s) is /are needed to teach beginning Mandarin in an elementary school?

3. What concepts in general music related to the development of pitch can align with initial Mandarin language lessons in an elementary school setting?

4. Which teaching strategies from best practices in language learning and general music can be applied to lesson plans designed to teach both beginning Mandarin and musical pitches in an elementary school setting?

Delimitation

The 10 lesson plans in this practicum were designed for elementary school students ranging from six to seven years of age in a beginning level Mandarin class.

In addition, through combining music teaching with Mandarin teaching, these lessons focused on improving students' pitch accuracy as well as Mandarin communication skills.

Definitions

Tone Language (Tonal Language): "A language in which the same series of sounds can represent different meanings, depending on how high or low they are spoken" (Cambridge Dictionary, n.d.)

Interdisciplinary: "A knowledge view and curriculum approach that consciously applies methodology and language from more than one discipline to examine a central theme, issue, problem, topic, or experience" (Jacobs, 1989, p.8).

Chapter 2: Review of Related Literature

A large body of research has examined the connections between music and language. Chen (1998) found that Cantonese-speaking children could sing pitches more accurately than English-speaking youngsters partly because of the various tones in Cantonese. In order to speak Cantonese, children need to master nine different tones, and this ability might transfer into pitch matching in music learning. Butzlaff (2000) found that music might be used to improve children's reading skill for several reasons. First, both music and reading materials utilized specific symbol systems and they required people to read from left to right. Therefore, reading music might be connected with reading texts. Second, music and reading required sensitivity to different sounds. As a result, music training might be beneficial to the development of auditory skills, which is also very important for phonological discrimination. Third, children may enhance their reading skill through singing songs with repetitive lyrics.

Hansen and Bernstore (2002) summarized six skills that were imperative for both text-reading and music symbol reading. These skills were phonological awareness, phonemic awareness, sight identification, orthographic awareness, cueing systems awareness, and fluency. Based on these common skills that were needed for reading music and language, he argued that music instruction and reading instruction might be mutually beneficial. Trinick (2011) also stated that a positive connection may exist between children's singing experience and linguistic development, since both the books and songs specifically for young children contained rhythm, rhyme, repetition, and refrain. Children could intensify their retention through singing and reading.

The possible link between music and language learning has led to a large body of literature. In this chapter, I will review this literature, focusing initially on the relationship among music background, music aptitude, and language ability. In addition, several studies that combine music teaching and language teaching will also be examined to explore themes that could be applied to the lessons in my practicum.

Music Background, Music Aptitude, and Language Ability

Luckett (1996) examined the connection between music training background and the success of second language learning at the college level. The research questions were (a) What are the traits of good foreign language learners? (b) Is it possible that good foreign language learners had more music training than less accomplished language learners?

The author reviewed literature on common features of language learning and music learning as well as the definition of good language learners. The theoretical framework of this study was based on the commonalities between music and language learning processes. There were two parts in this study. First, college students ($N = 211$) who enrolled in the Spanish class were asked to complete a music background survey. There were 18 questions in this survey regarding the formal music learning experience, regular practice time, opportunities for music performance as well as capability in singing, playing instruments, reading music, and composing. In addition, Luckett interviewed four foreign language teachers in college, and them to describe the characteristics of good language learners. "The Structured-Interview Guide was pilot tested on six college level modern foreign language instructors at three institutions before using in this study" (Luckett, 1996, p. 30). The researcher then asked the four interviewees to select 25% of the students in each of their classes who displayed these characteristics the most, as well as another 25% of the

students who had shown these characteristics the least. After that, Luckett examined the survey results of these selected students to find out the relationship between music background and language learning ability.

The characteristics of good language learners described by the instructors were mostly congruent with what had been found in previous literature. There were four characteristics that instructors agreed a good language learner should possess. The first is the proper classroom behavior, such as punctual attendance to each class and active interaction with peers and the instructor. Second, a good language learner should have personal characteristics such as confidence in learning a second language and motivation to communicate with native speakers. The third characteristic relates to the cognitive process, such as the capability of imitating intonation accurately and the willingness to ask questions about language. The last is the use of learning strategies, including the ability to focus on the meaning of a whole sentence instead of individual words while listening, and the frequent use of the target language outside of class.

The result of the survey (Luckett, 1996) indicated that good language learners (GLL) were more likely to have music performance experiences and music training background, particularly in instrument learning and music reading, than less capable language learners (LCLL). In the music background survey, 73% of GLL ($n = 44$) reported that they had the experience of learning one instrument, while 51% of LCLL ($n = 39$) reported that they had learned to play one musical instrument, X^2 (l, 83) $= 4.06$, $p < .04$. In addition, 32% of the GLL ($n = 44$) stated that they could play more than one musical instrument, while only 10% of the LCLL ($n = 39$) had such ability, X^2 (1,83) $= 5.66$, $p < .02$. Regarding the ability to read music, 49% of the GLL ($n = 41$) believed that they were at an

intermediate or advanced level while 2% of the LCLL ($n = 38$) assumed that they were skillful in reading music, X^2 (l, 79) = 6.63, $p < .01$. Moreover, 58% of the GLL ($n = 43$) had more than two years of formal music training while only 34% of the LCLL ($n = 38$) had similar experiences, X^2 (l, 81) = 4.64, $p < .03$. Among all participants in this survey, 83% of the GLL ($n = 41$) practiced music daily or weekly, while 53% of the LCLL ($n = 36$) had the same frequency of practice, X^2 (1,77) = 8.12, $p < .004$. When it came to willingness to perform, 58% of the GLL ($n = 43$) reported that they enjoyed performing music for others; however, only 36% ($n = 39$) of the LCLL enjoyed performing music, X^2 (l, 82) = 1.22, $p < .27$. Last, 86% of the GLL ($n = 43$) had performed in music recitals, while only 59% of the LCLL ($n = 39$) had similar performance experiences, X^2 (1,82) = 7.64, $p < .006$.

The validity of the music background survey was verified by three music professionals, and pilot tests were conducted before the study. This study suggested that a positive relationship may exist among musical background, musical ability, and foreign language skills. As a result, combining music teaching with language teaching might help students develop skills in both domains.

A similar experiment was conducted by Piro and Ortiz (2009). The purpose of this study was to investigate the influence of long-term piano training on vocabulary and verbal sequencing skills. It was a quasi-experimental study with students from two primary schools in New York City. Both schools offered literacy programs and shared the same demographic and geographic characteristics (as shown in the study). Students in the treatment group ($n = 46$) were from the school that provided formal music instruction as a uniform curriculum while those in the control group ($n = 57$) went to a school that did not offer a music curriculum.

At the beginning of this study, participants in the treatment group had already received two years of music training at school and they were about to enter the third grade. During this school year, they had two group keyboard lessons each week, and according to Piro and Ortiz (2009) "materials from the Music and the Brain (MATB) project served as the basic music curriculum" (p. 331). There was a certain sequence for each piano lesson. In each lesson, students were introduced to some music concepts such as rhythm, pitch, and tempo. They studied the music concepts through learning new songs, and before playing these new songs on keyboard, they were guided to clap the rhythm and sing the melody to develop a phonological awareness. They were also encouraged to create their own rhythms and recreate the rhythm patterns they heard through clapping hands. The next step was to do the musical warm-up. Students practiced a series of exercises on keyboard to improve dexterity and to prepare for learning the new piece. After that, students spent the majority of class time practicing songs on the piano. They learned to read musical notation and develop their piano skills through learning new songs. The repertoire consisted of many different music genres, such as classical music, world music, and folk songs. At the end of each class, students would do some creative musical activities, such as freely exploring the keyboard or improvising some melodies on the piano. They often played for each other at class and performed at concerts.

When learning the concept of musical directionality, the instructor showed students the contour of different melody lines (up, down, or flat), and students would use their body movements to represent the direction of the music. Students then read the music score and practiced the music on piano. They were also encouraged to have those pitches in mind and audiate the melody without actually touching the keyboard.

After all the instructional periods, participants were given two subtests of the Meeker Structure of Intellect (SOI)-Form L. "This standardized testing instrument was designed for a large urban school system and has been widely used throughout this school system since the early 1980s to measure discrete intellectual abilities of students from pre-kindergarten to grade 3" (Piro & Ortiz, 2009, p. 331). The validity of this test was verified by Roid (1984). The first subtest focused on vocabulary, and it tested students' ability to understand the meaning of words and concepts. Children were given several pictures and were asked to tell what was on each picture. Students were then given the second test, which was verbal sequencing. The instructor stated a sentence with several items in order, such as "Show me a ball inside a star" (p. 331), then children had to choose the picture that depicted what the instructor said. This study was conducted within a standard ten-month school year, and researchers analyzed the pre-test and post-test scores.

Piro and Ortiz (2009) used Levene's test to examine the equivalence of variances (experimental group and control group), and this showed that the control group had much greater variability than the experimental group in the post-test SOI verbal score, and that they did not have a great improvement on SOI vocabulary score (mean pre-test score was 15.82 and mean post-test score was 16.12), while children in the treatment group had significantly higher scores on the vocabulary tests (mean pre-test score was 15.67 and mean post-test score was 18.28, $p < .001$). Thus, the mean post-test vocabulary score of the treatment group was significantly higher than the mean post-test vocabulary score of the control group, $F(1, 100) = 41.57, p < .001$. This result was also true for the post-test verbal sequencing score of the two groups, $F(1, 100) = 58.86, p < .001$. The mean pre-test verbal sequencing scores of treatment group and control group were 10.89 and

10.26 respectively. However, the mean post-test verbal sequencing score of the control group dropped to 8.84, while the treatment group got a mean score of 13.28 in the post-test. Also, "no group by sex interactions for SOI vocabulary scores $F(1, 98) = .103, p < .748$, or for SOI verbal sequencing scores $F(1, 98) = .076, p < .784$" were found (Piro & Ortiz, 2009, p. 336). In summary, children with long-term piano training tended to have a better performance on vocabulary and verbal sequencing skills than those who did not have any music instructions.

The result of this study showed a positive relationship between long-term piano instruction and children's vocabulary and language skills. Some teaching methods from the piano lessons were applied in this practicum for my development of music and Mandarin lesson plans. For example, I designed many kinesthetic movements in my practicum. When teaching the four different Mandarin tones, students used four different movements to show the direction of each tone. In my lesson plans, the first and third Mandarin tones were also connected with *s* and *m* respectively. The different movements they did for high/low Mandarin tones could also remind them of the relationship between *s* and *m*.

Sleve and Miyake (2006) examined the relationship between musical ability and second language proficiency. Participants of this study were 50 native Japanese speakers aged from 19 to 52 ($M = 31.3$). They did not live in the US until the age of 11, and among these participants, 50% were students in the US, 22% were spouses of people who worked or studied in the US, and 28% were people who had jobs in the US.

Their English skills were tested in four domains: receptive phonology, productive phonology, syntax, and lexical knowledge. In the receptive test, participants were asked to discriminate 26 pairs of words with similar phonemes and differentiate 26 pair of sentences

that consisted of words with similar phonemes. In addition, they were given a written version of a short passage, and were asked to listen to the recording while labeling words that were pronounced in a wrong way. In the productive test, participants had to read those words and sentences in their receptive test, and two native English speakers decided which word they heard in each pair. A third judge was in charge of deciding all words and sentences when the previous two judges disagreed. Additionally, participants had to read an English paragraph and their performance recordings were given to two native English speakers. These two judges would then rate participants' performance on a 9-point scale. In the syntax test, participants had to listen to 72 sentences adapted from Johnson and Newport (1989) and check the grammar of each sentence. The lexical knowledge consisted of two parts: a vocabulary test and a listening comprehension test. The 25 vocabulary questions with multiple choices were adapted from the TOEFL practice book, and the 30 multiple-choice questions in the listening part aimed at testing participants' comprehension of idiomatic and colloquial expressions. Prior to the English skill tests, participants offered information about their language background, and researchers also tested participants' nonverbal intelligence and phonological short-term memory (STM).

In addition to the English ability test, participants were also asked to take some musical ability tests. The tests utilized were three subtests (Chord Analysis, Pitch Change, and Tonal Memory) of the Wing Measures of Musical Talents (Wing, 1968). In the chord analysis test, participants had to decide how many notes they heard in a one chord. In the pitch change test, participants listened to two chords and then answered whether they heard the same chord or not. If they detected differences between these two chords, they had to indicate the altered note. In the tonal memory test, participants listened to two short

melodies that only differed in one note and they had to identify the altered note. Apart from these three tests, researchers also asked participants to sing a short tune (three to seven notes) right after they heard it. Researchers then used a digital program to compare subjects' performances with the original tune, and a note was considered accurate if it was within one semi-tone of the original note.

After collecting and analyzing participants' scores on both English and music tests, researchers found that the correlations between musical ability and L2 receptive and productive phonology were .52 and .45 respectively ($p < .005$). The correlation between musical ability and L2 syntax was .35 ($p < .005$), and the correlation between musical ability and L2 lexical knowledge was .26 ($p < .10$). These results indicated that musical ability was more strongly related to L2 phonology than to syntax and lexical knowledge. In order to eliminate other possible explanations for this result, researchers also conducted a hierarchical regression analysis, which examined the relationship between participants' English ability and their age of arrival, length of residence, language use and exposure, phonological short-term memory, and musical ability. The final ß, which indicated the "standardized beta weight for each variable when controlling for all other variables" (Sleve & Miyake, 2006, p. 679), still showed a stronger correlation between musical ability and receptive phonology (final $\beta = .37$, $p < .005$), than there was between musical ability and productive phonology (final $\beta = .30$, $p < .05$). In contrast, the final beta for the correlation between musical ability and syntax was .13, and the beta for the correlation between musical ability and lexical knowledge was .04.

The results of this study illustrated a stronger connection between musical ability and L2 phonology, and this result corroborated findings from other researchers (Chen, 1998;

Eterno, 1961; Luckett, 1996; Morgan, 1992; Piro & Ortiz 2009). Some of the contents from the three music tests in this study, chord analysis, pitch change, and tonal memory, were adapted into aural training exercises in my own lessons. For example, students were asked to detect the high/low musical pitches and Mandarin tones during the class in order to train their aural skills. Once students got familiar with the Mandarin tones, they started to learn new Mandarin words by simply listening and echoing.

The relationship between music aptitude and second language ability was also investigated by other researchers. Morgan (1992) conducted a study to examine the correlation between music aptitude and the acquisition of a second language. Participants in this study were college students in the French department taking one of three different classes. Class A ($n= 44$) was for beginners and intermediate students; Class B ($n = 25$) was for intermediate students, and Class C ($n = 13$) was for advanced students. All participants were asked to take the music perception (rhythm and tone perception) test, speech perception test, music production test, and speech production (vowel production and accent production) test. In addition, they all completed a questionnaire regarding their previous language learning experience, mother tongue, musical background, and the opportunities to stay in a French-speaking environment.

Researchers analyzed participants' scores from all of the tests and found a significant correlation between rhythm perception and speech perception ($r = .30, p < .01$). A significant correlation also existed between rhythm perception and accent production ($r = .34, p < .05$), as well as between music production and accent production ($r = .34, p < .05$). However, tone perception did not have a significant correlation with speech production, speech perception, or accent production. In general, this

study suggested a positive relationship may exist among rhythm perception, music production, and accent production.

This finding was congruent with the pilot study of Eterno (1961), in which he examined the connection between musical aptitude and foreign language (Spanish) pronunciation. Participants of this study were sixth-, seventh-, and eighth-grade students from a grammar school in Long Island, New York. They were asked to take both a musical ability test and a Spanish pronunciation test, and the results indicated that 60% of the sixth graders, 60% seventh graders, and 77% eighth graders received the similar scores on both tests. Students received higher scores in the Spanish pronunciation test tended to also get higher scores in the musical ability test, and vice versa. This study suggested that music aptitude may have a positive influence on learning pronunciation of a foreign language. These two studies from Morgan (1992) and Eterno (1961) both suggest that students' music aptitude may be positively related to second language acquisition, especially in learning pronunciation. As a result, it is logical to combine Mandarin teaching with music teaching to increase the productivity of learning.

Tonal Language and Music Ability

As mentioned in the previous chapter, Mandarin is a tonal language, in which the meaning of each word can be affected by different lexical tones. Researchers have identified a positive link between tonal language and pitch production and perception (Deutsch et al.,2006; Peng et al. 2013; Pfordresher & Bowen, 2009). Deutsch, Henthorn, Marvin, and Xu (2006) examined the relationship between speech-related critical periods and the acquisition of absolute pitch. There were two groups of participants in the study. Group one consisted of 88 Mandarin speakers who were first-year students at Central

Conservatory of Music (CCOM) in Beijing. Group two consisted of 115 English speakers who were first-year students at the Eastman School of Music (ESM). The mean age of participants in the CCOM group was 20 (range 17-34), whereas the mean age of participants in the ESM group was 19 (range 17-23). In addition, participants in each group were subdivided into smaller groups based on the initial age of formal music training. Participants in both groups were asked to take a listening test that consisted of 36 notes within a three-octave range (from C^3 to B^5). All intervals of two consecutive notes were larger than an octave in order to avoid using relative pitch as a hint. Participants heard these notes from a CD player, amplifier, and two loudspeakers. After the test, participants had to fill in a questionnaire to provide information about their music education, native language and the language they speak with their parents, as well as the city in which they and their parents resided. ESM participants were also asked to identify their primary ethnic background. There were two criteria for the test: 1), 85% or higher of the total answers should be correct; 2), 85% or higher of the total answers should correct, but semitone errors were allowed.

The result showed that absolute pitch ability was related to years of formal music training. The test scores from participants in both groups indicated that the earlier music education began, the higher the chances that both criteria for absolute pitch were met. Additionally, the differences of test scores of CCOM participants and ESM participants in each subgroup were also significant. Under the standard of no error in the test, there were approximately 60% of CCOM participants who started their music training between the ages of four and five had absolute pitch, while only 20% of the ESM participants who began musical training at the same age had absolute pitch ($p <. 001$). Approximately 55%

of the CCOM participants who started their musical training between the ages of six and seven had absolute pitch, while about 15% of the ESM participants who began music training at this age had absolute pitch ($p < .001$). For CCOM participants whose music training began at the ages of eight and nine, about 40% of them met the criteria of absolute pitch, while none of the ESM participants met the criteria in this age group ($p < .001$). The situation was similar when semitone errors were allowed, with a higher percentage of participants meeting the absolute criteria in the CCOM group than in the ESM group (age of music training: four to five, $p < .001$; six to seven, $p < .001$; eight to nine, $p < .005$).

The results of this study indicated that the feature of the native language may affect the acquisition of absolute pitch, which may further influence the perception of musical tones. Native Mandarin speakers in this study gained higher scores in the listening test than native English speakers, which suggested that speaking a tonal language might be helpful in developing absolute pitch in music. As a result, the positive connection between tonal language and absolute pitch in music revealed in this study supported the idea of combining Mandarin teaching with music teaching. Students might improve their aural skills through learning Mandarin and through music training.

Peng, Su, Deutsch, Henthron, and Wang (2013) conducted a similar study to investigate the relationship between language experience and music pitch perception. Researchers recruited 283 first-year and second-year Chinese college students in Guangzhou, China, and 24 English native speakers who were first-year and second-year students at University of California, San Diego. The stimuli and procedure were borrowed from Deutsch et al. (2006), and all participants listened to 36 notes ranging from C3 to B5, and then wrote down the note they heard. The 36 notes were played in three groups (12

notes each group), and the interval between each group of two notes was larger than an octave in order to reduce the help of relative pitch. After the listening test, participants had to complete a questionnaire concerning their language and musical training background. According to the results of the questionnaire, researchers created three different onset age groups of musical training (Group 1: age 2-5, Group 2: age 6-9, and Group 3: age $\geq$ 10).

The results showed that both language background, $F(1, 295) = 15.47$, $p < .001$, and onset age of musical training, $F(2, 295) = 6.82$, $p < .001$, had a significant effect on pitch perception. Within the first age group (2-5), Mandarin speakers had a much higher mean percentage of correct answers than English speakers (approximately 70% vs 15%, $F(1, 42) = 8.12$, $p < .01$). There was also a significant difference in the mean percentage of correct answers between the Mandarin speakers (approximately 40%) and English speakers (approximately 10%) in the 6-9 age group, $F(1, 94) = 6.63$, $p < .05$. However, there was not a significant difference in pitch perception between Mandarin speakers and English speakers under the third age group ($\geq$ 10).

The results of this study suggested a positive relationship between tonal language background and music pitch perception. In addition, the results also showed earlier musical training resulted in stronger music perception ability. As a result, combing music teaching with Mandarin teaching during childhood might help students develop both language ability and music ability.

Pfordresher and Bowen (2009) also examined the relationship between tonal language and pitch processing in music. Participants ($N= 22$) included university students from Buffalo, NY, and 11 of these participants were native Mandarin speakers who had lived in China before studying in the US. Among the other half of the participants, nine

were monolingual native English speakers and two were bilingual intonation language speakers (one spoke English and Japanese, the other spoke Portuguese and German). None of the participants in the tonal and non-tonal language groups had significant formal musical training ($M = 2.00$ and 1.44 years for tonal and non-tonal language speakers, mode $= 0$ in both groups).

Participants in this study were asked to complete several tasks. The first was a set of warm-up exercises to test whether participants in both groups had similar vocal ranges and whether the music examples in the following tests fit those ranges. The next two tasks were note imitation and interval imitation. For the note imitation task, participants had to vocally imitate four-note sequences (chosen from C3, D3, E3, F3, and G3 for male participants, and C4, D4, E4, F4, and G4 for female participants). This study used the easiest level of note sequences, consisting of the same pitch played four times. For the interval imitation task, researchers changed the second or the third note in the four-note sequence and participants had to vocally imitate what they heard. There were two measurements used in the study. The first was absolute note errors, which assessed how well participants could repeat the exact note they heard. The second was interval errors, which assessed how well participants could imitate relative pitches. Then participants took the note discrimination and interval discrimination tests respectively. For the note discrimination, participants heard two notes separated by a one-second pause. For the interval discrimination, participants listened to two pairs of melodic intervals separated by a one-second pause. The first interval was C5 to G5, and the second interval was F#5 to C#6.

The result of the warm-up task showed small vocal range differences between the two groups of participants. Researchers used absolute note errors to measure the note imitation, and in order to reduce the effects of two statistical outliers, researchers used a Mann-Whiney U test which compared the two groups based on median note errors. The result showed that participants in the tonal language group (median = 47.5 cents, 100 cents = 1 semitone) had fewer note errors than participants in the non-tonal language group (median = 95.01 cents, $U = 93$, $p < .05$). After removing the two outliers, researchers used ANOVA to confirm the result. Results showed a significant difference in note imitation between the tonal language group and the non-tonal language group, $F(1, 18) = 7.36$, $p < .05$. The interval imitation was measured by the interval error, and the result from ANOVA also showed a significant differences between tonal language group and non-tonal language group, $F(1, 20) = 5.75$, $p < .05$. The result was also confirmed by a Mann-Whiney U test ($U = 95$, $p < .05$). The median of interval errors in the intonation language group was twice as high as the median in the Mandarin group. After removing one outlier in the intonation speaker group, the result remained the same, $F(1,19) = 6.27$, $p < .05$. However, there was no significant difference between the two groups in note discrimination. With regard to the interval discrimination test, the median of the Mandarin language group was significantly higher than the non-tonal language group, $t(20) = 1.92$, $p < .05$, $U = 90$, $p < .05$.

This study provided evidence that tonal language speakers might have some advantages on perception and production of music pitches. Pfordresher and Bowen (2009) stated that "the use of pitch to convey lexical information in one's native language facilitates the use of pitch in nonlinguistic contexts" (p. 1395). As a result, learning a tonal

language might be helpful in developing musical abilities, and this study supported the current project for developing interdisciplinary music and Mandarin lesson plans. Based on the result of this study, I focused on the connection of Mandarin pronunciation and aural training (pitch, interval, melody imitation, and discrimination) in music.

Using Music as Tool for Teaching Language

Ray (1997) conducted an experimental study to examine the efficacy of an ESL music curriculum and the amount of training needed for classroom teachers to teach English through music. The ESL music curriculum was designed by Ray and her associates. This pilot study was conducted in Loreto Elementary school in Los Angeles. The school was located in a predominately Latino community and the majority of students were from newly-settled immigrant families. Among all children in this school, 90% were Latino and 9% were Cantonese speakers. There were 14 bilingual classes from pre-kindergarten to second grade and 13 language teachers participated in this research.

Students were randomly assigned to three experimental groups (two weeks of daily, 30-minute ESL music lessons) and one control group (two weeks of daily, 30-minute ESL lessons without music). Instructors were also randomly assigned to an intensive training group (experts and the teacher implemented the music ESL curriculum together), a moderate training group (an expert occasionally instructed the classroom teacher), and a minimal training group (the instructor taught the music ESL curriculum independently). The effectiveness of the curriculum was measured by students' pre-test and post-test scores on a modified Language Assessment Scale (LAS). In addition, Ray used the Student Oral Language Observation Matrix (SOLOM) to identify students' English level. According to SOLOM, students were categorized in five levels: Preproduction (Students could only

understand but failed to speak), Early Production I (Students could speak simple words or make short phrases), Early Production II (Students could respond with simple phrases and sentences), Speech Emergency (Students could make advanced sentences but may sometimes use awkward words), Intermediate Fluency (Students could engage in daily communication but still sounded different with native speakers), and Fluency (Students sounded almost like native speakers but still needed help to improve the vocabulary). Ray named her language test used in this study the English Language Assessment (ELA), and in order to strengthen the test validity, Ray cooperated with 13 other teachers to test all pre-k, kindergarten, and elementary classes at Loreto. This school had already employed the LAS to identify LEP (limited English proficiency) students, and the result of the ELA test identified the same group of LEP students.

Classroom teachers were given a questionnaire to measure their confidence in teaching the music-driven English curriculum. In the first part of the questionnaire, teachers provided their demographic information in order to determine whether their other training might influence the result. The second part of the questionnaire used a Likert Scale, and teachers had to rate their confidence in teaching the curriculum. "Strongly Agree responses were given 100%, Agree responses 80%, Neither Agree or Disagree responses 60%, Disagree responses 40%, Strongly Disagree responses 20%" (Ray, 1997, p. 57). The researcher then collected the questionnaire and calculated the mean percentage for each question. Scores within 80%-100% indicated high confidence, 60%-80% indicated moderate confidence, 40%-60% indicated a lack of confidence, and 20%-40% indicated a low level of confidence. Then the results were compared and interpreted for each training group.

Ray (1997) first taught her own students (ranging in age from four to seven) before writing her one-unit curriculum. The topic of this unit was "Insects and Spiders," and Ray used children's songs such as *There's a Spider on the Floor* and *Baby Bumblebee*. In addition, Ray used some realia such as plastic spiders and picture song books, and she also offered 30 keyboards for her students. In each lesson, she played guitar and sang songs related to insects and spiders with her students and led students to move plastic spiders up and down as well as to pretend like they were flies trapped in the spider web. Students also read picture song books, played keyboards, danced with music, and mimicked actions of different insects such as hopping like grasshoppers and marching like ants. Students sang, danced, read, and performed in these lessons to learn targeted vocabulary related to the topic. After teaching these lessons, Ray (1997) took notes of all of the things she did with her students and developed a curriculum for elementary school teachers. Later in the research, classroom teachers in the experimental groups used this curriculum to teach English. The experiment lasted for two weeks and the result of the pilot study showed that music was an effective way for teaching language. In addition, regardless of whether the classroom teachers had background in music, they were capable of teaching the music-driven language curriculum. In the three experimental groups, 86% of the kindergarten kids, 100% of first-grade students, and 94% of second graders grew one or more English level. However, in the control group, only 21% of kindergarten children, 13% of first grade students, and 36% of second grade students reached a higher English level. With regard to teachers' confidence ($N = 13$), teachers in the intensive training group showed a 94% confidence rating; teachers in the moderate training group exhibited an 83% confidence rating, while teachers in the minimum training group indicated an 88%

confidence rating. It was also shown in the teachers' journal that even non-music background instructors may gain confidence in teaching the music ESL curriculum after training.

This study illustrated the effectiveness of using musical activities and materials to teach language. Some of the teaching methods, such as using song books with illustrations, using some realia, and incorporating dancing and performing in the music ESL lesson were adapted into my lesson plans. I used some cartoon pictures to help students see the high and low Mandarin tones and music pitches. When teaching different animal names, I also encouraged students to sing and dance like different animals. Moreover, the idea of setting up a topic and teaching vocabulary related to the topic was also be utilized in my lessons. The 10 lesson were divided into 2 units and each unit contained different themes that related to daily life. I also introduced some pitched and unpitched percussion instruments to my class in order to inspire students to connect the different instrument sounds with different Mandarin tones.

Li and Brand (2009) also examined the effectiveness of using songs in an ESL class. They put forward three research questions: (1) To what extent did the use of songs affect learning English vocabulary? (2) To what extent did use of songs affect English usage and meaning? (3) To what extent could ESL students be motivated by the strategy of incorporating songs in the English class? Participants $(N=105)$ in this study were college students (average age of 23) from a university in Shenzhen, China. All of them were applicants for the graduate law school, and their English skills were strictly evaluated in order to get into the school. Most of the participants' English levels were above average; however, due to the lack of opportunities to speak and listen in English, they reported

difficulties in the usage of English vocabulary and in clearly expressing themselves in English. Participants were randomly assigned to one of the three groups: Group one used music as the only tool for teaching English; Group two spent half of the class time using music to facilitate English teaching; Group three used no music to teach English. The instructor of the three groups was the same, and had a master's degree in linguistics and ten years of teaching experience. The instructor was also observed by a board of experienced college professors to make sure that equal enthusiasm and engagement were given to three groups.

This experiment contained six ESL classes and each class lasted for 90 minutes. Goals and teaching content were the same for the three groups, focusing on vocabulary acquisition, pronunciation, and meaning of each word. In group one and group two, American and British pop songs from bands such as the Beatles and the Rolling Stones were introduced in the ESL class, and the instructor would encourage students to listen to the natural way of English speech as well as asking questions about the grammar in the lyrics.

In addition, the instructor asked participants to circle unfamiliar words while listening to songs, and then explained the meaning and usage of these words. Students also practiced English pronunciation through singing these songs. Participants' performances were then evaluated by a researcher-designed test regarding acquisition of English vocabulary, understanding of usage meaning, and their perspectives (enthusiasm, satisfaction, and assurance) for the ESL class.

Results of students' pre-test and post-test scores indicated that students significantly improved their English ability, $t(105) = 14.237$, $p < .01$, in all groups ($N =$

105), regardless of using songs or not (Pre-test: Group one $M = 3.29$ $SD = 2.0$, Group two $M = 3.17$ $SD = 2.04$, Group three $M = 3.20$ $SD = 2.37$; Post-test: Group one $M = 10.19$ $SD = 2.23$, Group two $M = 8.37$ $SD = 2.74$, Group three $M = 9.73$ $SD = 2.33$). However, there was a significant difference among the students' English achievement in the three groups, $F(2,103) = 5.25$, $p < .01$. A post-hoc t-test indicated that students in group one (all music group) had much higher scores than students in group two (half music group), $t(69) = 3.077$, $p < .05$, and students in group three (no music group) also achieved higher scores than participants in group two, $t(63) = 2.135$, $p < .05$. The difference between the half music group and non-music group was not significant. The situation for the attitude test was similar, but with a great difference in English learning attitude among three groups, $F(2,103) = 3.64$, $p < .05$. A post-hoc t-test showed that students in the all-music group had higher attitude scores than students in the semi-music group, $t(69) = 2.052$, $p < .05$. Students in the non-music group also had higher scores on learning attitudes than students in the semi-music group, $t(63) = 2.528$, $p < .05$. However, there was no significant difference of learning attitude between the all-music group and the non-music group.

Researchers also conducted a delayed post-test (directed three weeks following instruction) to strengthen the reliability of the result, and this delayed post-test also demonstrated significant differences in language achievement scores among the three groups, $F(2,103) = 4.59$, $p < .05$. A post-hoc t-test still showed a significant difference between the all-music group and the semi-music group, $t(67) = 2.935$, $p < .05$. However, there were non-significant differences between the non-music group and the other two groups. Researchers explained that inconsistently using music in English class might bring

confusion to students and distract them from learning English; thus, students in the semi-music group received the lowest scores in the post-test and in the motivation test.

The result of this experimental study indicated that using songs (texts and music) could help Chinese, adult, ESL students learn English vocabulary, usage, and meaning. Employing this teaching strategy could also greatly increase students' motivation and confidence in learning English. However, in view of the lower score the semi-music group in this study, this teaching method may need to be used consistently throughout the lessons. Therefore, students learned Mandarin words and usages through practicing Chinese songs and rhymes in each lesson. In the last lesson, I introduced a Chinese song called 青花瓷 (Blue and White Porcelain). The primary goal was to show students the pentatonic scale used in Chinese songs. Also, the rhyming lyrics in the refrain could inspire students to categorize Chinese words that are pronounced in the same tone.

The effectiveness of introducing songs into an English class was also investigated by Coyle and Gracia (2014). The purpose of this study was to examine the effect of song-based activities on EFL students' vocabulary acquisition. Participants of this study were 25 Spanish children ranging in age from five to six years old. These children attended a semi-private school in Spain and they had studied English for two years before the study began. Their previous English classes emphasized comprehensive skills instead of oral skills, and most of the class time was spent on identifying key vocabulary and finishing worksheets in the textbooks. In this study, one researcher taught 30-minute lessons on three consecutive days in a week, and these lessons occupied students regular English class time.

The researcher introduced the song *The Wheels on the Bus* to the students and selected five words (wheels, wipers, horn, door, and bell) as the goal for vocabulary

acquisition. The researcher then followed a certain sequence in three lessons. In the first class, the researcher introduced the topic to students and guided them to visually recognize different parts of a bus as well as using body movements to help them understand. The instructor then sang the song twice, stressed the target words, and pointed at pictures on the Interactive White Board (IWB). After that, students listened to a karaoke version of this song and repeated what the instructor did. In the next class, the instructor showed students pictures of the five target words, and many of them could read these words by themselves. Each student then had to select the right picture according to the vocabulary they heard, and finally, all students listened to the song while performing actions the teacher did in the first lesson. At the beginning of the third class, each student identified one target word on the IWB in turn until all key words were repeated twice. The last part of this class was similar to the end of the second class, which students sang this song and perform with body movements. In all three lessons, children had seven times to listen to this song.

Prior to this study, students were given productive and receptive tests on these five key words in the song. Each child took this test individually in a quiet room and was asked to name the part of a bus on a colorful picture in English as well as to point at the words the researcher stated. Researchers repeated this test in order to eliminate the possibilities of guessing. The same test was given to students right after the third lesson and five weeks later after the instruction. Researchers video recorded the test and interviewed four children who got the highest scores and lowest scores in the post-test to know more about their learning experiences.

Researchers counted the number of words each participant could speak and recognize. The result showed that compared to their pre-test score, participants improved

greatly in the acquisition of receptive vocabulary five weeks after the instruction, F (2, 25) = 21.219, $p < .001$.

Also, based on the comparison of the mean ranks of three tests, children steadily increased their receptive vocabulary scores over time; however, the increase of their productive vocabulary scores was not significant. The comparison of the receptive vocabulary pre-test and post-test I scores ($Z = -2.961$, $p = .03$), and of receptive vocabulary pre-test and post-test II scores ($Z = -2.383$, $p = .17$) both indicated that song-based activities were effective in receptive vocabulary acquisition.

However, there was not significant improvement in productive vocabulary acquisition. Looking into each child's score, the researcher found out that half of the participants ($n = 13$) could recognize one or two words right after the instruction, and two children were able to identify all five words. However, the pre-test score showed that these two children had already known the meaning of "bell" before the study. The result also indicated that more children ($n = 12$) did the receptive vocabulary task better after five weeks than immediately after the instruction. Among these children, five increased the number of words they could recognize, and seven participants who failed to identify a single word at post-test I could retain at least one word in post-test II. However, with regards to the productive vocabulary acquisition, only four participants were capable of speaking one to five words on both post-tests. The interview with the two participants with the highest grades and two with the lowest grades suggested that children who did well at post-test were more motivated than those who did poorly at post-test.

This study showed the positive effect of using songs to improve students' L2 vocabulary acquisition. The pre-test and post-test had content validity, and the reliability of

the result was strengthened by the two post-tests. The teaching sequence used in this research were adapted for developing music and Mandarin lesson plans. For example, I prepared a main topic for each lesson, and students learned Mandarin words related to that topic through reading Chinese rhymes or singing Chinese songs. I also used colorful pictures to visualize the targeted words in order to enhance students' memory. The purpose of these activities was to encourage students to use different senses when learning music and language.

Similar research on the effectiveness of songs in EFL class was conducted by Davis and Fan (2016). They carried out an empirical study to examine the effectiveness of using songs on English vocabulary acquisition in the preschool EFL class. There were three classes from two kindergartens in Beijing that participated in this study. The number of children in these classes (labeled A, B, and C) were 20, 21, and 23 respectively, and all participants were between five to six years old. The Researcher proposed two research questions: (1) Did the teaching strategy of introducing songs into an EFL class have greater effect on children's English vocabulary acquisition? (2) Which methods (teaching EFL vocabulary through songs or through choral repetition) had a better effect on vocabulary acquisition? Prior to the study, all participants were given a pre-test on knowledge of English vocabulary. The test comprised of 15 small cards and each card had a cartoon picture on one side. Students had to use short English phrases to describe what they saw on the card, such as "the lion is angry" or "it's hot and sunny" (Davis & Fan, 2016). Researchers audio-recorded students' responses and counted the number of meaningful morphemes students said. "A long tradition of research assessing mean length of utterance (MLU) was adapted in this study" (Davis & Fan, 2016, p. 64). In the case of "the lion is

angry", a complete phrase equals four morphemes, and the word "lion" equals one morpheme.

Students were then given 15 lessons within seven weeks, and each lesson lasted for 40 minutes. These classes were taught by the same teacher and the sequence of each class was the same. The instructor would first sing the same warm-up song in each lesson and then teach songs from the English textbooks for grades one and two. All of these songs consisted of familiar melodies such as *Twinkle Twinkle Little Star* and *The More We Get Together*, but the texts were new and contained targeted vocabulary. Participants could see the relevant image on the screen while learning the song. The pictures given to students were the same used in the pre-test, that is to say, the instructor taught students those 15 short phrases during the seven-week study. "The 15 items were assigned to the three classes with five items in each of three conditions: song, repeat and control" (Davis & Fan, 2016, p. 65). In the way of learning phrases through songs, student sang each song while watching the related picture on screen. For example, when teaching the phrase "The three little pigs are very afraid," students were introduced to the *Three Little Pigs* song and were given pictures related to this phrase. The repeat condition meant that students watched the picture on the screen and read each phrase after the teacher in a together. The teacher repeated each phrase twice in every class. In the control condition, children were not exposed to any phrases or relevant pictures during the class time and they could only see these pictures in the pre-test and post-test.

Students' answers to the pre-test and post-test were cyphered for MLU (mean length of utterance). The results of the study indicated that students' post-test scores were much higher than their pre-test scores, $F(1, 42) = 31.05, p < .001$. There was a significant

difference between the song and control conditions, $F(1, 42) = 22.29$, partial eta^2 = .35, and the difference between the repetition and control conditions was also significant, $F(1, 42) =$ 18.22, partial eta^2 = .30. This illustrated that the song and repetition conditions were more effective than the control condition. However, there was only a small difference between the song and repetition conditions. Therefore, this study showed that teaching vocabulary through songs and through choral repetition were equally beneficial in targeting language acquisition.

This experiment was different from the previous study (Coyle & Gracia, 2014; Li & Brand, 2009; Ray, 1997) in that it added a control condition, in which students did not have access to the targeted phrases during the instruction period. "As control items did not lead to any acquisition over the same time period as items in the song and choral repetition conditions, alternative explanation for acquisition might be ruled out" (Davis & Fan, 2016, p. 68). This study had content validity because items used in the pre-test and post-test were the same in the instruction period. The results of this study revealed the pedagogical value of songs in English class and the positive effect of introducing songs to enhance vocabulary acquisition. It reinforced the rationality of using songs to improve learning a second language and the method of using a familiar melody with new texts to teach vocabulary were used in my lesson plans. I introduced the Chinese version of *Mary Had a Little Lamp* in my lesson, and I also added Chinese lyrics to some simple *sol mi* songs. Students used these songs to practice Chinese vocabulary words related to the class topic.

The connection between music instruction and language skills was also examined by Gromko (2005). The purpose of her study was to investigate the effect of a music intervention on young children's phonemic awareness. Participants of this study were

kindergarten children ($N = 103$) from two elementary schools in a Midwestern city. One of them was the treatment school ($n = 43$) and another was the control school ($n = 60$). All children in this district were required to take the Dynamic Indicators of Basic Early Literacy Skills test (Good, Gruba, & Kaminski, 2002). Students took subtests in fall, winter, and spring within a school year, and each subtest focused on students' different abilities, including "initial-sound fluency (ISF), letter-naming fluency (LNF), phoneme-segmentation fluency (PSF), and nonsense-word fluency (NWF)" (Gromko, 2005, p. 202). During the study, children in both schools were offered nearly the same amount of reading instruction; however, only children in the treatment school received music instruction from music methods students attending a local university. Children in the treatment group attended the 30-minunte music lesson once a week from January 2004 until the end of April 2004, and one kindergarten teacher was responsible for mentoring the music lesson. Bruner's theory of cognitive development (1960, 1966, 1970) served as the foundation of the music curriculum, and children followed a sequence to learn music in each class. Students would first sing a new folk song that represented one of the cultures in the world, followed by using body percussion to accompany their singing. After that, children practiced some percussion instruments such as shaker eggs and guiro. Lastly, students were given a touch graphic chart that represented steady beat, rhythm, or melodic contour. The effect of this music curriculum on students' performance of spatial-temporal tasks was verified by five subtests of the WPPSI-R (Gromko & Poorman, 1998).

Altogether, children took the letter-name fluency (LNF) test, phoneme-segmentation fluency (PSF) test, and the nonsense-word fluency (NWF) test again in May 2004. "For the LNF subtest, children looked at a grapheme and said its name. For the PSF subtest,

children heard a word and responded with its component sounds. For the NWF subtest,

children looked at a word and sounded it out" (Gromko, 2005, p. 203). The result of the

pre-test scores indicated that the students in the treatment group got lower grades on LNF

(control group: M= 36.27, SD = 18.87; treatment group: M = 33.42, SD = 15.48), PSF

(control group: M = 25.83, SD = 14.73; treatment group: M = 18.61, SD = 16.26), and NWF

(control group: M = 20.61, SD = 23.90; treatment group: M =11.30, SD = 17.09) tests than

children in the control group. However, after music instruction, the mean achievement for

letter-naming fluency for participants in the treatment group (M = 9.21, SD = 10.38) were

higher than participants in the control group (M = 7.83, SD = 12.61). The mean gains in the

nonsense-word fluency test between the treatment school (M = 9.86, SD =9.79) and the

control school (M= 15.42, SD = 19.06) were not significant. The mean scores for

phoneme-segmentation fluency showed the most significant difference between the two

schools (t = -3.52, df = 101, p = .001). Students in the treatment school got a mean gain

score of 26.12 (SD =16.05) in the phoneme-segmentation fluency test, while children in the

control group got a mean gain score of 15.72 (SD = 13.83) in that test. Gromko (2005)

further clarified that the most significant discrepancy between the two schools on the PSF

test score may be explained by the nature of phoneme-segmentation skill.

Phoneme-segmentation was an aural skill, and the development of children's aural skill

was also emphasized in the music class. As a result, this study showed a positive

relationship between music instruction and the improvement of students' phonetic

awareness. The ecological validity of this study is strong since both the language test and

the music curriculum were based on previous models adapted for practice. The music

teaching sequence used in this study were adapted into Mandarin teaching. Because

Mandarin is a tonal language, I used many kinesthetic movements to help students memorize the pitches and different Mandarin tones when teaching a Chinese song. Additionally, I used many pictures to visualize some abstract concepts, such as different Mandarin tones, beats and divisions, and the relationship between different musical pitches.

Summary

The close relationship between music and language has been documented by many researchers (Arleo, 2000, Butzlaff 2000, Chen 1998), and many foreign language teachers have introduced music into their classes to facilitate language learning (Coyle & Gracia, 2014; Davis & Fan, 2016; Gromko, 2005; Li & Brand 2009; Ray, 1997). In most cases, the results of researchers using songs in the language class indicated that students' foreign language abilities, including pronunciation, vocabulary acquisition, and language usage were improved with music intervention. In addition, students' motivation for learning a foreign language also increased when music was consistently incorporated in the language class. Researchers have also tested the relationship between musical background, musical aptitude, and language ability (Eterno, 1961; Luckett, 1996; Morgan, 1992; Piro & Ortiz, 2009; Slevc & Miyake, 2006). The results of these studies indicated that music training background, especially instrumental learning experience, had a positive effect on second language learning. Additionally, people with higher levels of music aptitude tended to have better foreign language pronunciation. There were some studies that specifically examined the relationship between tonal language and musical abilities (Deutsch et al., 2006; Peng et al., 2013; Pfordresher & Bowen, 2009), and these studies determined that

people with tonal language background may have some advantages in processing musical pitches.

All the studies reviewed in this chapter highlighted the positive connection between music and language learning. Many of the teaching methods used in these studies, such as incorporating singing, listening, body movements, and instrument playing into the language class, were considered for adaptation into my own lessons.

In addition, the different music genres used in these studies, such as folk songs, children songs, and pop music, were used in the Mandarin lesson to increase the variety of repertoire. Ultimately, students could use music to learn Mandarin listening comprehension, pronunciation, and usage for communication purposes, and they could also develop music skills such as pitch matching and rhythm accuracy in these lessons.

Chapter 3: Methodology

The purpose of this practicum was to create 10 lesson plans that use music to teach Mandarin pronunciation, listening comprehension, and syntax. The goal of these lessons was to improve students' Mandarin communication skills and develop music skills simultaneously. These lesson plans were designed for beginning level Mandarin students in elementary schools, and followed the Standards for Chinese Language Learning (2016, see Appendix A) and National Music Standards (2014, see Appendix B). For the Mandarin teaching, I focused on the standards for Mandarin communication and connection with other disciplines. For the music teaching, I emphasized the standards for music performing, creating, and connecting.

The document *Standards for Foreign Language Learning: Preparing for the 21st Century* was first published in 1996 (American Council of the Teaching of Foreign Languages, n.d.). "It was developed by American Council on the Teaching of Foreign Language (ACTFL) and other national associations of foreign language teaching" ("Sonrisas Spanish Blog", 2018). In 2016, the document was revised and more languages were added into it, such as Arabic, Japanese, and Chinese.

Development of the Lesson Plans

This was a practicum which presented interdisciplinary Mandarin and music lesson plans for American elementary schools. The design of the lesson plans followed and connected to the standards for Chinese language learning and for general music education. These lesson plans focused on teaching Mandarin pronunciation, listening comprehension, and syntax through a series of musical activities, which also allowed students to develop their musical skills and build connections between language learning and music learning.

After identifying connections between the national language and music standards, the development of the lesson plans was based on previous literature, observations of Mandarin and music classes at a local elementary school, and interviews with the elementary school Mandarin and music teachers. I synthesized effective practices and materials used in previous studies and adapted them for my lesson plans. Finally, I wrote my lesson plans based on Mandarin and music teaching standards, previous literature, and information collected from the elementary school teachers related to best practices in teaching and learning.

I adapted some of the teaching approaches used in previous studies. For example, Li and Brand (2009) used classic rock songs for Chinese college students to learn English. English teachers first introduced these songs in class and asked students to circle unfamiliar words when listening. Afterwards, teachers explained these words and provided examples of appropriate usage. Students also practiced English pronunciation through singing songs. In my lessons, I introduced Chinese pop songs that are age-appropriate for elementary school students to listen to.

Coyle and Gracia (2014) used the song "Wheels on the Bus" to teach targeted words (wheels, wipers, horn, door, and bell). The teachers asked students to listen, sing, and move with the song, and they also used pictures to facilitate students' understanding and memorization of those targeted words. In my lesson plan, I used songs and incorporated listening, singing, dancing, and visual cues to teach targeted Mandarin vocabulary while also developing musical skills.

Davis and Fan (2016) used songs to teach targeted English vocabulary to Chinese children. These songs were all familiar melodies to children, however, the lyrics contained

targeted words. Participants were also given pictures related to the song as they sang the song. I also incorporated familiar melodies with new texts when teaching Mandarin to students. Many well-known songs, such as *Twinkle Twinkle Little Star* and *Edelweiss* have Chinese versions, which may be used in the Mandarin class.

Participants

The participants of this practicum were a music teacher and a Mandarin teacher in a suburban area of the Midwestern United States. I observed their classes and interviewed them to collect materials for my lesson plans. I received approval from IRB on September 6, 2019 to conduct interviews with these two elementary school teachers.

Procedure

I visited a local school that offers both Mandarin and music classes in order to observe these classes and their teachers and relate these observations to my review of literature. I also scheduled an interview with the Mandarin teacher (see Appendix C) and asked her questions related to learning objectives for Mandarin, course content, instructional sequences, and resources that are used in the class to meet instructional goals. As a part of this interview, I determined the degree to which the teacher utilizes songs as a part of instruction and if she collaborated with the music specialist when teaching (see Appendix D). After interviewing the Mandarin teacher, I created an outline of Mandarin teaching content and sequence for elementary school students. I also scheduled an interview with the elementary music teacher at the same school to determine if she taught songs in other languages, especially Mandarin (see Appendix E). Her answer was positive, so I asked what songs she used in her class and how she taught different languages while also developing musical skills (see Appendix F). Then I gathered the information from the

music teacher and from previous literature for use with the development of my lesson plans. The information from the observations and interviews, along with the findings from previous research, provided the foundation for the 10 lesson plans I created.

In addition, I analyzed the Standards for Chinese Language Learning (2006), the elementary school beginning level Mandarin curriculum, the National Core Arts Standards (2014), and best practices in general music education for use in my lesson plans.

Chapter 4: Results and Lesson Materials

The first part of this chapter consists of the analysis of National Music Standards (2014) and Standards for Chinese Language Learning (2016), followed by a review of the interviews, class observations, and the synthesis of teaching methods used in previous literature. In the second part of this chapter, I present the 10 interdisciplinary lesson plans that were developed based on the information in part one.

Analysis of the Standards

The National Music Standards (2014) address four specific artistic processes: Creating, Performing, Responding, and Connecting. The 11 anchor standards are organized around the artistic process they address. The Standards for Chinese Language Learning (2016) are categorized in 5Cs: Communication, Cultures, Connections, Comparisons, and Communities. Examining both sets of standards reveals several common areas that they share. Music standards developed for the artistic processes of creating and performing ask students to generate musical ideas, refine artistic techniques, and present artistic works. These standards correspond with the Communication objectives from the Mandarin standards. Students who study Mandarin will develop their interpersonal, interpretive, and presentational communication skills. They will understand and convey meanings in Mandarin while also engaging in Mandarin conversations. Therefore, both music and Mandarin standards require students to interpret and present the knowledge within the two domains, which were processes emphasized in my lesson plans.

In addition, both the National Music Standards (2014) and the Standards for Chinese Language Learning (2016) include standards that address connecting disciplines to other disciplines and cultural backgrounds. In music learning, students are expected to

understand the culture and social backgrounds of a given artistic work, and connect the work with their personal experiences. In Mandarin learning, students are asked to connect the language with different disciplines and to use Chinese in different learning contexts. As a result, beginning level music and Mandarin classes can develop students' knowledge in music and Mandarin so that they can further explore Chinese music culture in more advanced classes. The 10 interdisciplinary lesson plans also aimed at improving students' skills for interpretation and presentation in both music and Mandarin. In addition, these lesson plans connected the ideas in the music domain with the concepts in Chinese language domain.

Interviews with the Music Teacher and the Mandarin Teacher

In order to get a clearer idea of how course material from music and Mandarin classes might be incorporated into a series of lesson plans, I conducted interviews with one elementary general music teacher and one Mandarin teacher. Both teachers were from a local elementary school and they participated in the interview individually. Each participant had to answer some questions that were prepared before the interview. I chose this elementary school because it had a Mandarin immersion program, and the Mandarin teacher taught some subjects in Chinese, such as Math and Science.

Interview with the Music Teacher

Interview questions:

a.   Have you ever taught songs in other languages, especially Mandarin?

b.   What kinds of songs in other languages do you usually introduce to your students?

c. How do you teach songs in other languages?

For the first question, the music teacher said that she had never taught anything in Mandarin and that this was primarily due to the fact she was unfamiliar with the Mandarin tones. She had taught songs in "traditional languages," such as Spanish and Italian, since those languages were easier for her to learn and translate.

For the second question, the music teacher said that she had introduced folksongs with simple words to the class. She believed that these songs were more straightforward and more accessible. Also, she was using a Kodály-based approach in her classroom so she needed songs that addressed specific musical concepts. She would use the musical concepts she hoped to teach as a guide for selecting songs in different languages.

With regard to the third question, the music teacher gave a very simple answer: by echoing. She said that she would ask students to do a call-and-response exercise to learn the song. She didn't teach her students the International Phonetic Alphabet (IPA) because of the limited time for the music class. She would do her best to teach the language accurately. She learned the songs in different languages by listening to the recording to make sure that she had the correct pronunciation. She would explain the meaning of the texts to her students when teaching a song in a new language so that students could have connections with the song they performed.

Interview with the Mandarin Teacher

Interview questions:

a. What Mandarin teaching standards do you concentrate on in your class?

b. What materials do you use in order to meet these standards?

c. Do you use music to teach Mandarin?

d.   Have you ever collaborated with the music teacher when introducing music (songs) into your class?

The interview with the Mandarin teacher began right after the conversation with the music teacher. For the first question, the Mandarin teacher said that she used the World-Readiness Standards for Learning Languages published by the American Council on the Teaching of Foreign Languages (ACTFL) as a reference. She also used a Can-Do Statement (2017) as a check list. This statement was published by National Council of State Supervisors for Languages (NCSSFL) and ACTFL, and it clearly set goals for language learners at different levels. In her classes, she focused on standards for communication (speaking and listening).

For the second question, the Mandarin teacher explained that she utilized a Chinese immersion program. She used Chinese to teach Math and Science and she translated the materials for Math and Science classes into Chinese. Usually she would introduce a theme to the students and then gave students some worksheets in Chinese. She would also adapt games in Chinese that matched the theme of the class.

For the third question, the Mandarin teacher said that she tried to use music to teach students some line-up songs. She believed that it worked very well when using music to teach Mandarin. She also said that she gave students CDs so that they could listen to some Chinese pop songs they liked. The teacher printed out the lyrics with Pinyin (the romanization of Chinese Characters that indicates pronunciations) and a translation, and students listened to the songs repeatedly at home. She also encouraged the students to teach the songs to their parents or siblings.

With regard to the last question, the music teacher and the Mandarin teacher answered this question together. They both said that they had not collaborated with each other but they planned to in the future. The music teacher indicated that because it was the first year of the Mandarin immersion program in the school, both teachers wanted to wait until the program was operating smoothly to begin collaborating.

At the end of the conversation, the music teacher indicated that, anecdotally, the students who were in the Mandarin immersion program seemed to have better pitch accuracy than her other students. She found that it was easier to perform pitch matching exercises with the students from the Mandarin class. She also added that the parents of the students in the Mandarin immersion program were very supportive and involved. They were very curious about what their children learned in the Mandarin class and they were willing to help support students' learning. For example, some of the parents learned Mandarin together with their children and they often communicated with the Mandarin teacher about their children's Mandarin learning processes.

Synthesis of the Two Interviews

There were several interesting things to note in the interviews. First, the music teacher and the Mandarin teacher chose different kinds of music to teach their students. From the music teacher's perspective, her teaching methods were informed by the Kodály approach so she used many folksongs in her class. However, the Mandarin teacher selected some Chinese pop songs that might be more familiar to genres students listen to at home. The students they worked with were third graders who had some knowledge in music and Mandarin. However, students in the beginning level music and Mandarin classes may not be able to perform Chinese folksongs or pop songs with complex texts and melodies.

Therefore, students in the beginning level lessons would benefit from learning some simple Chinese children's songs and rhymes while also listening to Chinese folksongs and pop songs in order to familiarize themselves with the Chinese tunes.

In addition, both the music teacher and the Mandarin teacher mentioned that they used call and response (echoing) to teach new songs and new words. They also used kinesthetic movements to facilitate teaching. For example, the music teacher always used Curwen hand signs to teach pitches, and the Mandarin teacher used different gestures to show the different Mandarin tones. As a result, these techniques were incorporated into my interdisciplinary lessons by incorporating different movements with the musical material.

Thirdly, the materials the music teacher chose were based on the musical elements she wanted to teach, while the Mandarin teacher chose the materials based on the theme of the lesson. This was very informative to the development of my interdisciplinary lesson plans. In each lesson, students might learn Mandarin vocabulary related to a certain theme. The teacher will keep using this vocabulary during music teaching and use materials such as pictures, songs, and rhymes that cover the targeted vocabulary so that students can practice the new words through music.

Class Observations

The primary purposes for the class observations were to see how music and Mandarin were taught in American elementary schools, and what kinds of teaching strategies could be incorporated into my lesson plans.

Observation of the Music Class

The class I observed was a 3rd grade music class. At the beginning of the music class, the students reviewed the song and the dance *Bobolinka*. It was an action song and

students did the movements according to the lyrics. After that, students practiced solfege and identified the positions of *m*i and *sol* on their fingers. The music teacher then presented several pitch patterns on the screen, the students first listened to the pitches from the recording, and then sang on the solfege names with corresponding hand signs. During this process, students were also given the opportunities to sing each pattern individually before they sang together.

There were several activities from this class that were utilized in the current lesson plans. The music teacher chose to teach an action song so that students could sing with movements. The lesson plans I created also utilized movement with singing to reinforce language goals for the song. The actions corresponding to the texts might strengthen students' memory of the targeted words. *Bobolinka* was a folksong, which corresponded with what the music teacher mentioned before that she often introduced folksongs to her students. In addition, when practicing singing the solfege names, students first listened to the recording and audiated the pitches. It was a good way to improve students' aural skills. This was incorporated into the interdisciplinary lessons as a way to help students identify the subtle tone changes in Mandarin and the different musical pitches. Finally, the teacher gave students opportunities to lead the class and to perform individually, which could assess an individual's performance and increase students' motivation.

Observation of the Mandarin Class

The Mandarin class I observed was a Mandarin immersion math class. Students were 3rd graders from a Mandarin immersion program who had been studying Mandarin since kindergarten. The topic of this lesson was counting (addition, subtraction, multiplication, and division). Before the class, the teacher and the students spoke some

Chinese rhymes to state the class rules. For example, students said 1 2 3, 木头人，不说话 (mùtóurén bùshuōhuà)

(wooden statue does not talk), which reminded themselves to be quite during the class.

This step matched what the Mandarin teacher mentioned in the previous interview about

using Chinese rhymes as teaching materials. Then the teacher gave students a worksheet

and students finished it individually. After that, the teacher presented some counting

questions on the screen and students answered the questions together. The teacher used

representative icons, for example, the teacher gave the equation: one dog plus one dog is 12,

then students figured out that one dog represented the number 6. In the next part of the

lesson, students were divided into several groups and they played some counting games

developed by the teacher. For example, one group of students played a card game called "I

Have, Who Has". It was written on each card that "I have ___ (a given number), who has

____(a given counting question, student has to figure out the answer and say the number)".

All students spoke Chinese when playing the game. This game was originally a board game

and the Mandarin teacher adapted the game for classroom use.

Some of the teaching materials and strategies in this lesson that were adapted in

the interdisciplinary lessons include the use of Chinese rhymes to organize the class. The

rhymes used in the math class had simple lyrics, direct meanings, and repetitive rhythms,

which were easy for students to understand and repeat. Therefore, Chinese rhymes were

used in the lessons included in this practicum to teach rhythm and Mandarin vocabularies.

Additionally, the teacher used representative icons when asking students to do the counting.

Students practiced counting as they learned the Chinese names for the icons. Those icons

visualized abstract concepts so that students could better understand the information. As a

result, some icons were used to teach musical concepts and introduce the Chinese names

for those icons. The Math games utilized strengthened students' counting skills and allowed them to engage in Chinese conversations. In a similar way, the interdisciplinary lessons utilize group games in order to improve musical skills while also communicating in Mandarin.

Development of the Lesson Plans

Previous Literature

In the previous literature, many researchers combined music teaching with language teaching. The common methods they used including singing, kinesthetic activities, visual aids, and musical instruments (Coyle & Gracia, 2014; Davis & Fan, 2016; Gromko, 2005; Li & Brand, 2009; Piro & Ortiz, 2009; Ray, 1997). These teaching methods were shown to be helpful for both music learning and language learning. Therefore, the current practicum borrowed and adapted some of the teaching methods found in previous literature.

Materials

The materials for music teaching were partly based on the previous literature. In the previous literature, the common songs that teacher used were folk songs, children's songs, and pop songs (Coyle & Gracia, 2014, Davis & Fan, 2016, Gromko, 2005, Li & Brand, 2009, Ray, 1997). In addition, Xie (2017) examined several factors that teachers should consider in song selection: the Chinese Syllabus, students' Mandarin level and their personalities, and students' interests. Xie (2017) conducted the study in a government high school in New South Wales (NSW), Australia. He suggested teachers to follow NSW Chinese Syllabus. Therefore, since the current lesson plans will be implemented in the United States, they will follow the Standards for Chinese Language Learning (2016) and

use the Can-Do Statement (2017) mentioned above as a guideline to ensure the lyrics of the songs fit students' ability. According to the Can-Do Statement (2017), students in the novice low level should be able to communicate and recognize some simple words on familiar topics, and use simple vocabulary words to present information. When it comes to students' interest, Xie (2017) mentioned 8 factors that affected students' interest in learning Chinese songs: simplicity, repetition, rhythm, rhyming, action, visual effect, culture, and instrument. Those criteria for choosing repertoire were considered in the development of lesson plans.

The material for Chinese language teaching was adapted from the textbook *Zhongwen*. "*Zhongwen (Mandarin Chinese Language)* course materials for the trial edition were developed by the College of Chinese Language and Culture, Jinan University, under the commission of Overseas Chinese Affairs Office of the State Council of People's Republic of China" (College of Chinese Language and Culture, Jinan University, 2006, p. 3). *Zhongwen* is a collection of 12 volumes that are designed for students with different levels. In each volume there are several units with different topics. Some topics in the first volume were covered in the lesson plans.

Lesson Plans

The 10 lesson plans were divided into two units (see Table 1). All the themes selected were from *Zhongwen* Volume 1, which was designed for beginning Mandarin learners. Upon finishing the 2 units, students should be able to identify high and low musical pitches and sing songs using a pentatonic scale (*d r m s l)*. They will also be able to speak some simple Mandarin words and sentences using the correct tones.

The goal for each lesson was to teach students a certain musical concept, such as a new rhythm or a new pitch pattern. Meanwhile, I incorporated some Mandarin vocabulary words into the music teaching processes so that students could also learn some new words and expressions in Mandarin. The themes contained some words that students could use in their daily conversations. The topic in each lesson was easy to understand and related to students' daily lives.

Table 1 *The Two Units of the 10 Music and Mandar Lesson Plans*

Unit	Theme	Goals for Music Teaching	Goals for Chinese teaching
Unit 1 Lesson 1-5	- Chinese tones vs Music Pitches - Numbers - Greetings	- Students will detect high/low musical pitches and connect high/low sounds with different movements - Students will learn and practice the rhythm *titi & ta*	- Students will learn the four different Mandarin tones and learn the pronunciation of 1-10 in Mandarin. - Students will learn greetings in Mandarin.
Unit 2 Lesson 6-10	- Position - Animals	- Students will learn and practice singing *d r m s l* patterns and identifying their positions on staff	- Students will use Mandarin to describe different directions - Students will learn the Chinese names for different animals

Lesson plan 1

Length of Class: 30 minutes

Class Setting: Beginning Music-Mandarin class for students from six to seven years of age.

Students have limited experiences in music and Mandarin.

Music Standards

Creating: Anchor Standard #1. Generate and conceptualize artistic ideas and work.

Connecting: Anchor Standard #10. Synthesize and relate knowledge and personal experiences to make art.

Mandarin Standards

Interpretive Communication: Students understand and interpret written and spoken language on a variety of topics in Chinese

Presentational Communication: Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics

Connection: Students reinforce and further their knowledge of other disciplines through Chinese language.

Materials: Piano, projector, blackboard

Objectives

a. Students will learn and speak using the four tones in Mandarin.

b. Students will use different body movements to show the higher and lower musical pitches they hear.

c. Students speak the numbers "1, 2, 3, 4, 5" in Mandarin with correct pronunciation.

d. Students will speak in the first/third tone based on the high/low musical pitches they hear.

Procedures

1. Body warm-up: students stand in front of their chairs and stretch their body (reach up high, stretch down low, bend knees, roll shoulders, etc.).

2. Vocal exploration: the teacher will instruct students to stand in a good singing posture, and then students follow the teacher and sigh on /u/ from the top to bottom. The teacher then shows the symbol of four different Mandarin tones and demonstrate the four different sounds on /u/, and students repeat after the teacher.

3. The teacher points at the first tone symbol and say /I/, and then points at the third tone symbol and say /u/. Students repeat after the teacher. After that, the teacher will tap on the shoulders when pronouncing /I/ in the first tone, and tap on the knees when pronouncing /u/ in the third tone. Students follow the teacher.

4. The teacher shows a picture of a balance. On the left side of the balance there are five cookies and on the right side of the balance there are only one cookie (see Figure 1). The teacher counts the number of cookies on each side with the students, and then tells students that since the left side has more cookies than the right side, it is heavier and lower than the right side. After that, the teacher tells students that "five" in Mandarin is /u/ (in third tone, lower sound), and "one" in Mandarin is /I/ (in first tone, higher sound). The teacher always taps the knees while saying /u/ and taps the shoulders while saying /I/.

5. The teacher plays "D5" on the piano and sing /I/, and then play "B4" on the piano and sing /u/. The teacher sings these two notes in different rhythms and with the body movements, and students sing after the teacher and with body movements. After that,

the teacher only plays the piano and ask students to sing (/I/ or /u/) and use their body movements to show the pitches they heard.

6. The teacher will add one more syllable in the "/I/ and /u/ pattern", which is pronounced as /san/ in the first tone. Students will repeat and sing with body movements. The teacher will then explain that /san/ means "three" in Mandarin. After that, the teacher will invite nine students to make three groups. Group 1 only has one student, group 2 has three students, and group 3 has five students. Students in group 1 and 2 will stand, and students in group 3 will sit on the floor. Then the teacher will point at different groups, and the rest of students need to sing the correct number in the correct Mandarin tones. Students will always sing different pitches with their body movements.

7. The teacher will stomp between /I/ /san/ and between /san/ /u/, and say / er/ and /si/ with each stomp. Students repeat after the teacher. After that, the teacher will explain that the number between one and three is two (pronounced as / er/), and the number between three and five is four (pronounced as /si/). Both two and four in Mandarin are in the fourth tone, so they sound like an accent.

8. The teacher and students will review the body movements for the five numbers: tap shoulders (1) – stomp (2) – tap shoulders (3) – stomp (4) – tap knees (5). After that, the teacher will say the five numbers in different rhythmic patterns, and students repeat after the teacher with body movements.

Assessment

1. The teacher will check whether students can detect the higher and lower Mandarin tones and musical pitches by looking at their body movements during the class.

2. The teacher will listen to the students individually and check whether they can pronounce "1 2 3 4 5" in the correct Mandarin tones.

Figure 1 *The Example of the Balance with Five Cookies on the Left and One Cookie on the*

Right Used in Step 4

Lesson Plan 2

Length of Class: 30 minutes

Class Setting: In the previous lesson, students already learned the four Mandarin tones and the pronunciation of 1, 2, 3, 4, 5 in Mandarin. They also used their body movements to show the different tones/musical pitches they heard.

Music Standards

Creating: Anchor Standard #1. Generate and conceptualize artistic ideas and work.

Connecting: Anchor Standard #11. Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.

Mandarin Standards

Interpretive Communication: Students understand and interpret written and spoken language on a variety of topics in Chinese.

Presentational Communication: Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics.

Connection: Students reinforce and further their knowledge of other disciplines through Chinese language.

Materials

Piano, one drum, blackboard, projector

Objectives

a. Students will speak 6, 7, 8, 9, 10 in Mandarin.

b. Students will practice speaking 1 to 10 in different rhythms.

c. Students will detect high and low musical pitches and Mandarin tones.

Procedure

1. The teacher will lead the same body warm-up and vocal exploration exercises as the previous class.

2. The teacher will write 1, 2, 3, 4, 5 under the corresponding Mandarin tones (see Table 2). The teacher will then remind students the Mandarin pronunciation for 1, 2, 3, 4, 5 with corresponding body movements.

3. The teacher will sing 1 and 3 on the note "D5", and will sing "five" on the note "B4". Students imitate the teacher with corresponding body movements. Then the teacher will play these two notes on the keyboard and students need to speak the correct number based on the higher or lower note they heard. Students can speak either 1 or 3

in Mandarin once they hear "B4". The teacher will then summarize the pitch pattern for 1, 3, 5, which is "high high low".

4. The teacher will tell students that the task for today is to learn 6 to 10 in Mandarin. Among these numbers, there is also a "high high low" pattern like 1, 3, 5, which is 7, 8, 9. The teaching will then sing 7 (qi) 8 (ba) 9 (jiu) with the same body movement pattern as 1, 3, 5, and the students will imitate the teacher. The students will then practice 7, 8, 9 in different rhythm.

5. Once students get familiar with the pronunciation of 7, 8, 9, the teacher will introduce a new sound, which is 10 (shi pronounced in the second tone). So far it is the only number that is pronounced in the second tone, and the teacher will tell students that the second tone sounds like a question so they can make a "question pose".

6. The teacher then reminds students of the motion for 2 and 4 (stomp), and then add one more number for stomp, which is 6 (liu, pronounced in the fourth tone). Then the teacher will write 6 to 10 under the corresponding Mandarin tones, and students will practice pronouncing 6 to 10 in different rhythm with body movements.

7. The teacher and students will keep practicing detecting high and low sounds: the teacher play "D5" and "B4" on the piano. "D5" is for the first tone (1, 3, 7, 8), "B4" is for the third tone (5, 9). The teacher will add a drum sound to represent the fourth tone (2, 4, 6). The teacher will make a "question pose" to indicate number "10". Students need to say the corresponding number according to the sound they hear. For example, when they hear "D5", they can choose to speak one of the numbers from 1, 3, 7, 8. When they hear the drum, they may choose to speak one of the numbers from 2, 4, and 6.

8. At the end of the class, the teacher will play a rhyme called "Yoyo number song". The rhythm only has the words from 1 to 10 but it is in b-boxing style with strong rhythmic pattern. Students can listen to the rhyme and speak with the recording.

Assessment

1. During the class, the teacher will check whether students can say the correct number and do the correct movement according to the high and low musical pitches they heard.

2.   During the class, the teacher will listen to the students individually and check whether they can pronounce 6 to 10 correctly.

Table 2 *Numbers Under Corresponding Tones*

First tone	Second tone	Third tone	Fourth tone
1 yi 3 san 7 qi 8 ba	10 shi	5 wu 9 jiu	2 er 4 si 6 liu

Note. The Mandarin teaching starts with the pronunciation of 10 numbers because these numbers cover all the Mandarin tones. Students can get familiar with the 4 tones through counting in Mandarin.

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Lesson Plan 3

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Length of Class: 30 minutes

Class Setting: In the previous two lessons, students already learned how to pronounce 1 to 10 in Mandarin and they practiced detecting higher and lower linguistic tones and musical pitches.

Music Standards

Creating: Anchor Standard #1. Generate and conceptualize artistic ideas and work.

Connecting: Anchor Standard #10. Synthesize and relate knowledge and personal experiences to make art.

Mandarin Standards

Interpretive Communication: Students understand and interpret written and spoken language on a variety of topics in Chinese.

Presentational Communication: Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics.

Connection: Students reinforce and further their knowledge of other disciplines through Chinese language.

Materials

Blackboard, projector, piano, several chime bars with two pitches (D5 and B4), several tambourines and drums, several boomwhackers (D5 and B4).

Objectives

a. Students will practice speaking the numbers from 1 to 10 in Mandarin.

b. Students will play tambourines, drums, and boomwhackers.

c. Students will identify the instrument sounds and their corresponding Mandarin tones.

Procedure

1. The teacher will lead the same body warm-up and the vocal exploration as the previous class.

2. The teacher will play the video "Yoyo number song" that students watched in the previous class to help students review the pronunciations for the 10 numbers. The teacher will write each number under the corresponding Mandarin tones.

3. The teacher will introduce the name of the percussion instruments to students and tell them that these instruments can be categorized into 2 groups: unpitched and pitched instruments. Pitched percussion instruments are used to produce different musical

pitches. The teacher will play the D5 chime bar and say 1 (/I/, first tone) as an example. Unpitched percussion instruments are used to play a sound that does not relate to a certain musical pitch. The teacher will play the tambourine and say 2 (/ɜr/ fourth tone) as an example.

4. Each student will get one instrument. Students need to identify whether the instrument they have is pitched or unpitched, and they have to say a number that matches the sound of the instrument they get. For example, if one student gets a drum, he or she might say a number that is pronounced in the 4th tone (2, 4, 6). If a student gets a D5 chime bar, he or she might say a number that is pronounced in the 1st tone (1, 3, 7, 8). The teacher will play the D5 and B4 chime bars first and ask students to identify which note is higher and which is lower so the students can relate these two chime bars to different numbers.

5. The teacher will ask students who get the pitched instrument (chime bar, boomwhacker) to stay in one group, and students who get the unpitched instrument (tambourine, small drum) to form another group. Then students in the pitched percussion instrument group will also divide into higher pitch group (D5) and lower pitch group (B4). The teacher will not give many instructions during the process of finding groups. Once they finish forming the three groups (D5 group, B4 group, unpitched group), the teacher will introduce a new rhyme called "one two three, three two one" in Mandarin. Students will repeat after the teacher to learn the rhyme (see Figure 2).

6. Once students get familiar with the rhyme, the teacher will point at each group and students in the group have to say the corresponding number and play their instrument to

perform the rhyme. When it comes to 10 (the 2nd tone), the teacher will ask all the students to say it together and make a "question pose".
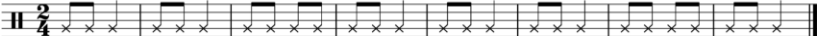
7. Students will freely form several groups and improvise their own number rhymes. For example, if a group has two tambourines and one B4 chime bar, they can improvise a rhyme using numbers from 1, 2, 3, 4, 6, 7, 8, 10. Each group will present their unique work to the whole class.

8. At the end of the class, the teacher will play the Chinese version *Ten Little Indians*. Students can review the numbers in Mandarin through listening to the recording. They can also put the numbers they learned in a whole sentence through singing with the recording. The teacher will also explain some new words in the song, such as 小朋友 (xiǎopéngyǒu) means kids, and 印第安 (yìndìān) is the transliteration for Indian.

Assessment

1. The teacher will check whether students can recognize pitched and unpitched percussion instruments by asking them to identify the category of the instrument individually and to form into different groups during the class.

2. The teacher will check whether students can speak the correct tones that matches the sounds of their instruments.

一二三 (yī èr sān)， 三二一 (sān èr yī) **One Two Three, Three Two One**

Figure 2 *Score for One Two Three, Three Two One*

Lesson Plan 4

Length of Class: 30 minutes

Class Setting: In previous lessons, students already learned four different Mandarin tones. They could detect different tones and connect the Mandarin tones with musical pitches. Students have explored pitched/unpitched percussion instruments. Also, they can use Mandarin to count from one to ten.

Music standards

Connecting: Anchor Standard #11. Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.

Creating: Anchor Standard #2. Organize and develop artistic ideas and work.

Mandarin standards

Interpretive Communication: Students understand and interpret written and spoken language on a variety of topics in Chinese.

Presentational Communication: Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics.

Connection: Students reinforce and further their knowledge of other disciplines through Chinese language.

Materials

projector and screen

Objectives

a. Students will practice speaking 1 to 10 in Mandarin.

b. Students will show their understanding of the beat and division in simple meter by tapping beat/division alternately.

c. Students will speak quarter note and two eight notes rhythmic patterns.

Procedure

1. Students stand in a circle. The teacher will play the Chinese version *Ten Little Indians* they learned in the previous lesson. The teacher will pat the steady beat on each leg and ask students to follow. Then the teacher will tap different parts of the body to keep the steady beat. The teacher and students will also keep the steady beat on feet and walk in a circle. Students can also sing with the recording while doing the warm-up exercise.

2. The teacher will speak "1 2 3, 3 2 1" on "chi" and then ask students to identify the rhyme. If students cannot remember the rhyme, the teacher will show the numbers to remind them. The teacher will keep the beat while speaking the rhyme.

3. The teacher will then tap the rhythm and speak the rhyme, and the students will follow the teacher. The teacher and students will alternate between the rhythm and the steady beat while speaking the rhyme.

4. The teacher and students will keep the steady beat and speak the rhyme again. The teacher will then pat each leg two times to perform the micro beat while speaking the rhyme. Students will follow the teacher. After that, the teacher will ask students how many times do they pat on each leg? Students will answer and speak the rhyme while patting the micro beat again.

5. The teacher will show students a picture of one whole pizza divided into two halves to explain the macro beat (beat) and micro beat (division) to the students (see Figure 3). The teacher will point at the whole pizza and two halves of the pizza, and students will tap the beat and division alternately. The teacher will then point at the division and the beat to show the rhythm of this rhyme, and students will say the rhyme while clapping on each syllable. After that, the teacher will ask students to rearrange some pizza pictures to show the rhythm of the first two measures.

6. Once students have the correct answer, the teacher will show students the music notation for the two halves of pizza and a whole pizza, which is two eighth notes and one quarter note. The teacher will also tell students the rhythmic syllables for the two eight notes and one quarter note: titi ta.

7. The teacher will speak some rhythmic patterns and students will echo. The teacher will then point at the numbers on the whiteboard and speak some Chinese numbers using the rhythm titi and ta. Students will echo. After that, one student will use the rhythm titi and ta to speak some numbers in Mandarin, and other students will first echo the numbers and then name the rhythmic pattern. Students will take turns to be the leader.

8. The teacher will show students rhythmic notation for the rhyme "1 2 3, 3 2 1". Students will keep the beat and speak the rhythm syllables. After that, they will speak the rhythm in Mandarin.

Assessment

1. During the class, the teacher will observe students tapping the beat, the divisions, and the rhythm to ensure that they can distinguish between these concepts.

2. The teacher will listen the students speak the rhythmic syllables to check whether they can perform a quarter note and two eighth notes.

3. The teacher will listen to the students say the number in Mandarin to check whether students can speak these numbers in the correct tone.

Figure 3 *Example of Beats and Divisions Using Pizza Icons in Step 5.*

Note. The picture on the left will be used to explain one quarter note and two eighth notes. Students will rearrange the halves of pizza and the whole pizzas to show the rhythm of the rhyme 1 2 3, 3 2 1.

Lesson Plan 5

Length of Class: 30 minutes

Class Setting: In previous lessons, students learned how to count from 1 to 10 in Mandarin. They also learned the rhythmic notation for two eighth notes and a quarter note.

Music Standards

Performing: Anchor Standard #5. Develop and refine artistic techniques and work for presentation.

Performing: Anchor Standard #6. Convey meaning through the presentation of artistic work.

Connecting: Anchor Standard #11. Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.

Mandarin Standards

Interpersonal Communication: Students engage in conversations, provide and obtain information, express feelings and emotions, and exchange opinions in Chinese.

Materials

Blackboard

Objectives

a. Students will practice the rhythm *titi* and *ta* through speaking a Chinese rhyme.

b. Students will practice counting from 1 to 10 in Mandarin.

c. Students will show the Chinese greeting style by shaking hands with the teacher and speaking "Hello" and "Goodbye" in Mandarin.

Procedures:

1. The teacher will point at the four Mandarin tones on the blackboard, and students can choose a neutral syllable to pronounce each tone. After that, the teacher will point at the four Mandarin tones randomly, and each student has to say a number which is pronounced in that tone.

2. The teacher will say some *titi ta* patterns and students will echo. Then the teacher will say a rhythmic pattern and students answer with a different pattern. After that, the teacher will speak different numbers in Mandarin in different rhythm, and students will repeat after the teacher.

3. The teacher will speak a new Mandarin rhyme called "Read the Children's Song" (see Figure 4). The first two lines of this rhyme are just numbers from 1 to 10 in Mandarin. After counting the number, the teacher will go to each student and shake hand with each individual. The teacher will say "Ni Hao" while shaking hand with them. Then the teacher will wave at each student and say "Zai Jian", and go to the next student. After doing this, the teacher will ask students to guess the meaning of "Ni Hao" (Hello) and "Zai Jian" (Goodbye).

4. Once the students have the correct answer, the teacher will tell students that people in China usually shake hands to greet each other. Then the students will practice speaking

"Ni Hao" and "Zai Jian" in different rhythm. Then the teacher will tell students how to say "Hello Teacher" in Mandarin, which is "Lao Shi Hao" (Lao Shi means teacher). After that, students will practice speaking "Ni Hao" "Zai Jian" "Lao Shi Hao" "Lao Shi Zai Jian" in different rhythm.

5. Students and the teacher will play a greeting game. Students will sit in a semi-circle, and they will speak the first two lines of the Mandarin rhyme, which are numbers from 1 to 10. They will also tap the steady beat on their legs while counting. Then one student will walk to the teacher and shake hand with the teacher while saying "Lao Shi Hao". The teacher will also shake hand with the students and say hello to that student. After that, the student and teacher will shake hands and say "Ni Hao", then they will wave at each other and say "Zai Jian". The student will go back to his/her position, and all the students will repeat this process.

6. After the game, the teacher will show students the rhythmic notation for this rhyme on the screen. Students will keep the steady beat and read the rhythm together. Then students will be divided into two groups. One group will read the rhythm while tapping the steady beat on their legs, and the other group will read and clapping the rhythm.

7. Students will greet each other in Mandarin: They will first walk around and speak the first two lines of the rhyme. Then each student needs to find a partner and greet each other in Mandarin using the third and fourth lines in that rhyme. Then they will walk again and find a new partner.

Assessment:

1. During the class, the teacher will check students' mastery of the rhythm *titi ta* through call-response exercise and through listening to the students reading the rhythmic notation.

2. During the class, the teacher will listen to students counting from 1 to 10 in Mandarin with different rhythm in order to check their pronunciation.

3. The teacher will check students' mastery of Mandarin greetings through the greeting games.

<p style="text-align:center">读儿歌 **Read the Children's Song**</p>

Figure 4 *Score for 读儿歌 Read the Children's Song*

Note. This rhyme was adapted from Zhongwen Volume 1, p. 5

Lesson Plan 6

Length of Class: 30 minutes

Class Setting: In previous lessons, students already learned four different Mandarin tones. They could detect different tones and connect the Mandarin tones with musical pitches. Students also learned the quarter note and eighth note, and they could read the rhythmic notation.

Music Standards:

Creating: Anchor Standard #2. Organize and develop artistic ideas and work.

Connecting: Anchor Standard #11. Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.

Mandarin Standards

Interpretive Communication: Students understand and interpret written and spoken language on a variety of topics in Chinese.

Presentational Communication: Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics.

Connection: Students reinforce and further their knowledge of other disciplines through Chinese language.

Materials

Music staff whiteboard, piano

Objectives

a. Students will sing *s m* patterns with correct hand signs.

b. Students will identify *s m* by ear.

c. Students will put *s m* on staff.

d. Students will speak the words "up" and "down" in Mandarin.

Procedures

1. The teacher will say "Ni Hao" to each student, and each student will say "Lao Shi Hao" to the teacher. The teacher will greet students at the beginning of each lesson.

2. The teacher will lead the body warm-up. Teacher will first lead students to stretch up their arms and say "Shang" (fourth tone), and then lead students to stretch down their

arms and say "Xia" (fourth tone). After that, the teacher will ask students to guess the meaning of these two words based on the two movements they just did. Then the teacher and students will do some other body warm-up as previous lessons.

3. The teacher will write the four Chinese tones and lead the vocal warm-up as previous lessons. After that, students will take turns to lead the vocal warm-up.

4. The students will review the "1 2 3, 3 2 1" rhyme they learned before. The teacher will point at the corresponding tones when students saying the rhyme. After that, the teacher will point at the first and the third tone, and sing D5 and B4 respectively on the syllable "lu". Students will identify the high pitch and low pitch with corresponding body movements.

5. The teacher will tell students that the solfege syllable for the pitch which sounds like the first Mandarin tone is *s*, and the solfege syllable for the pitch which sounds like the third Mandarin tone is *m*. The teacher will also teach the hand signs for the two pitches.

6. The teacher will then introduce the staff. First, the teacher will use Mandarin to count the five lines and four spaces from low to high. Then the teacher will tell students that the first Mandarin tone and the third tone are not consecutive, because there is a second tone in between. Similarly, there is also another pitch between *s* and *m*, so *m* always has to skip that pitch to *s*. When *s* is on the line, *m* is one line below *s*; when *s* is on the space, *m* is one space below *s*.

7. The teacher will sing a *s m* pattern with hand signs, and students will repeat after the teacher. Then one student will write the *s m* pattern on the blackboard and other students will check.

8. The teacher then reminds students the words up and down in Mandarin. The teacher will also ask students to identify the Mandarin tones for these two words. If students have difficulties identify the linguistic tone, the teacher will compare the sounds of these two words with the words they have learned in order to help students remember the sounds of the four tones.

9. The teacher will point at *s* and *m* on staff and ask students to sing the solfege syllables with hand signs. The students will also have to say the correct directions in Mandarin. For example, if the students see the pattern *s m s m*, they will first sing the pitches with hand signs, and then say "Shang (up) Xia (down) Shang (up) Xia (down)".

10. The teacher will use the finger staff to show *s* and *m*. Students first follow the teacher's instructions to find *s* and *m* on their fingers. The teacher will then show the position of *s* and ask students to find *m*, and vice versa.

11. The teacher will use body movements to show *s* and *m*. For example, the teacher will tap head to represent *s*, and tap the thighs to represent *m*. Students have to sing the correct pitches and show the two pitches on their finger staff. They also have to say the correct directions in Mandarin. After that, students will take turns to lead this exercise. The leader can improvise different movements to represent *s* and *m*.

Assessment

1. During the class, the teacher will listen to the students and check if they can sing *s* and *m* correctly. At some point of the class, the teacher will ask students to sing individually or in small groups to check their performance.

2. The teacher will check students hand signs, finger staff, and their body movements to ensure that they understand the relations between *s* and *m*.

3. The teacher will listen to the students say the words "up" and "down" in Mandarin. The teacher will also check if students can use Mandarin to describe the relations between *s* and *m* (*s* is Shang, *m* is Xia).

Lesson Plan 7

Length of Class: 30 minutes

Class Setting: In the previous lesson, the students learned *s* and *m* and their positions on staff. They also learned "up" and "down" in Mandarin.

Music Standards

Performing: Anchor Standard #5. Develop and refine artistic techniques and work for presentation.

Connecting: Anchor Standard #11. Relate artistic ideas and works with social, cultural and historical context to deepen understanding.

Mandarin Standards

Interpersonal Communication: Students engage in conversations, provide and obtain information, express feelings and emotions, and exchange opinions in Chinese.

Materials

Projector, music staff white board, the pictures of different animals.

Objectives

1. Students will practice singing *s m* patterns.
2. Students will use Mandarin to describe the relations between *s* and *m*.
3. Students will speak "left" and "right" in Mandarin.

4. Students will learn animal names in Mandarin by singing the song "Cuc-koo, where are you" in Mandarin.

Procedures

1. The teacher will lead the body warm-up: first stretch up the arms and then stretch the arms down. The teacher will ask students to say the words "up" and "down" in Mandarin while doing the corresponding movements. The teacher will stretch up the arms to the left and say "Zuo" (left), and then stretch the arms to the right and say "You" (right). Students will follow the teacher's movements and repeat the two words. Then the students will follow the teacher's instructions in Mandarin and stretch their arms to different directions.

2. The teacher will sing *s m* on the syllable "lu". Students will stand when they hear the higher pitch *s*, and sit when they hear the low pitch *m*.

3. The teacher will show the hand signs for *s* and *m*, and students watch the teacher's hand signs and sing. Students will then put *s* and *m* on their finger staff and sing some *s m* patterns.

4. The teacher will point at *s* and *m* on the whiteboard, and students sing the patterns with hand signs. They will also speak "up" and "down" in Mandarin after singing each pattern. After that, the teacher will teach students how to say the sentence "*s* is above *m*" in Mandarin (*s*在*m*的上面). Once students learn this sentence, the teacher will ask students to figure out how to speak "*m* is below *s*" in Mandarin (*m*在*s*的下面). The grammar is the same, and students only have to change the word "above" to "below" in Mandarin.

5. The teacher will sing "Cuc-koo" on *s m*, and students will repeat the animal sound on *s m*. Then students have to guess what animal it is. Once students figure out the answer: bird, the teacher will show a picture of bird and teach students the word "bird" in Mandarin（小鸟）. Then the teacher will mimic some other animals' sounds on *s* and *m*, such as "meow meow" (cat), "oink oink" (pig), "quark quark" (duck), and "baa baa" (sheep). The students will repeat after the teacher and guess the animals. Then the teacher will show the pictures of these animals and teach students their Chinese names. After that, the teacher will ask students to think about some other animals and mimic their sounds on *s m*. One student will perform the sound and other students will repeat and guess, then the teacher will teach the Chinese name of that animal.

6. The teacher will sing the song *Cuc-koo, where are you*? in Mandarin (see Figure 5). The teacher will first sing on solfege with hand signs, and students will repeat after the teacher. Then the teacher will sing the different animal names in Mandarin while pointing at the corresponding pictures, and students will repeat after the teacher. The teacher will also teach students the lyrics "where are you?" in Mandarin: 你在哪?

7. Students will play a game: One student will hide his/her eyes to be the guesser. The teacher will point at one animal picture and students first sing the song together. Then one student sings the song individually, and the guesser has to find out the performer.

8. After the game, the teacher will show students the music. Students will first read the rhythm and then speak "up-down" patterns of the pitches in Mandarin. After that, they will sing on solfege with hand signs and then sing on texts.

Assessment

1. The teacher will observe students' movements (stand and sit) to check whether they can identify *s* and *m* by ear.

2. The teacher will observe students' hand signs and finger staff to check whether they know the position of *s* and *m*.

3. The teacher will listen to students sing *s* and *m* to check whether they can sing the two pitches accurately.

4. The teacher will listen to students speak different animal names in Mandarin to check if they pronounce the words correctly.

5. The teacher will point at different animal pictures and ask students to name the animal in Mandarin to check whether students can remember those new words.

小鸟, 你在哪？ **Cuc-koo, Where Are You?**

Figure 5 *Score for* 小鸟, 你在哪 *Cuc-koo, Where Are You?*

Note. Translation for the lyrics: Cuc-koo, where are you? Cuc-koo, where are you?

Lesson Plan 8

Length of Class: 30 minutes

Class Setting: In the previous lesson, students learned *s m* and the relations between these two pitches on staff. They also learned the words "up" and "down" in Mandarin.

Music Standards

Creating: Anchor Standard #2. Organize and develop artistic ideas and work.

Performing: Anchor Standard #6. Convey meaning through the presentation of artistic work.

Connecting: Anchor Standard #11. Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.

Mandarin Standards

Interpretive Communication: Students understand and interpret written and spoken language on a variety of topics in Chinese.

Presentational Communication: Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics.

Connection: Students reinforce and further their knowledge of other disciplines through Chinese language.

Materials

Projector, music staff whiteboard, a toy bird

Objectives

a. Students will practice singing *s m* and putting *s m* on staff.

b. Students will practice speaking the words "up" and "down" in Mandarin.

c. Students will sing *l* and with the corresponding hand sign.

d. Students will speak more animal names in Mandarin.

e. Students will sing a Mandarin song "Birds Fly" and speak the new Mandarin words in the song.

Procedures

1. The teacher will mimic some animal sounds on *s m*, and students have to say the animal name in Mandarin.

2. The teacher will sing *s* and *m* on the syllable "lu" with corresponding hand signs, students then have to sing the solfege names with hand signs. After that, the teacher will write down *s* and *m* on staff, and point at these two pitches. Students will then sing the correct solfege names.

3. The teacher will sing a *m s l* song on solfege (the same melody as Bounce High, Bounce Low, see Figure 6), but will not sing the solfege name for *l*. Then the teacher will ask students to figure out whether the new pitch in the song is higher or lower than *s*. Once the students have the correct answer, the teacher will introduce the new pitch *l* and its hand sign.

4. The teacher will show the pictures of a giraffe, an elephant, and a pig. Students have to rank them based on their height (giraffe-elephant-pig, from high to low, see Figure 7). Then the teacher will teach students the Chinese names of these animals. After that, the teacher will put a *s* above the elephant, and ask students to figure out what solfege names should be given to the giraffe and the pig. Once students have the correct answer, the teacher will write the solfege name above each animal.

5. The teacher will then write *m s l* on staff, and tell students that the giraffe and the elephant are very close friend so they always stay next to each other. Therefore, *l* is just one step above *s*.

6. The teacher will point at the *m s l* on the whiteboard, and students have to sing the correct solfege name with hand signs. Students will then be divided into two groups. Group one sings while the other group listens and provides some feedback. After that,

the teacher will ask students to put the *m s l* on their finger staff. The position of the starting pitch will be given, and the teacher will point at different pitches while students show the position of different pitches on their fingers.

7. The teacher will sing the *m s l* song again. Students will learn the song phrase by phrase with hand signs. After that, the teacher will sing the Mandarin lyrics. The teacher will also hold a toy bird and show students that the bird flies up and down while singing the song. Then the teacher will ask students to guess the meaning of the song, based on the Mandarin vocabularies they already learned and the teacher's action. Once students have the answer, the teacher will explain some new words in the song, and then lead students to "fly" up and down. The teacher will encourage the students to sing together while doing the movements.

8. The teacher will show students the music on the screen, and will read texts for the students. Students will repeat after the teacher and then sing the whole song on text.

   Assessment

   1. During the class, the teacher will listen to the students sing *m s l* to check whether they can sing the three pitches accurately. At some point of the class, the teacher will ask students to sing individually or sing in small groups.

   2. During the class, the teacher will check students' hand signs and finger staff to ensure that they understand the relations among *m s l*.

   3. The teacher will check students' mastery of the new Mandarin vocabularies by listening to the students say the animal names and sing the Mandarin song.

xiǎo niǎo fēi
小 鸟 飞 **Birds Fly**

Figure 6 *Score for* 小鸟飞 *Birds Fly*

Note. Translation for the lyrics: fly up, fly down, fly up and fly down. Melody is the same as *Bounce High, Bounce Low*.
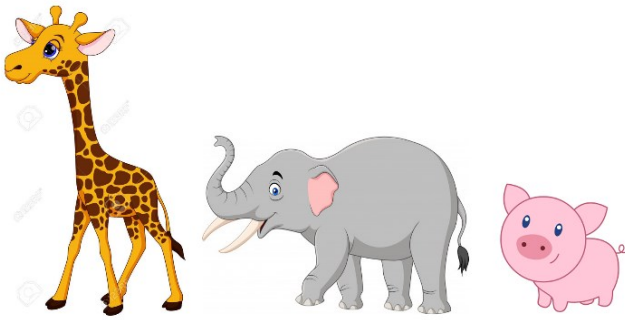
Figure 7 *Giraffe, Elephant, and Pig Represent l s m*

Lesson Plan 9

Length of Class: 30 minutes

Class Setting: Students already learned *m s l* and their positions on staff in the previous lessons. Students can also understand the vocabularies "up, down, left, right" in Mandarin and they know some animal names in Mandarin.

Music Standards

Creating: Anchor Standard #2. Organize and develop artistic ideas and work.

Performing: Anchor Standard #6. Convey meaning through the presentation of artistic work.

Connecting: Anchor Standard #11. Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.

Mandarin Standards

Interpretive Communication: Students understand and interpret written and spoken language on a variety of topics in Chinese.

Presentational Communication: Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics.

Connection: Students reinforce and further their knowledge of other disciplines through Chinese language.

Materials

Music staff whiteboard, piano, projector

Objectives

a. Students will practice speaking "up, down, left, right" in Mandarin.

b. Students will practice singing *m s l* patterns.

c. Students will sing *d r* and put *d r m s l* on staff.

d. Students will practice speaking animal names in Mandarin.

e. Students will sing the Chinese version of *Mary Had A Little Lamb*.

Procedures

1. The teacher will show the hand signs of *m s l* and students sing on the solfege names. After that, the teacher will point at *m s l* on the staff and then students sing on the solfege names.

2. The teacher will play *m s l* on the piano and students will use different positions to show different pitches they hear (stand-*s*, jump-*l*, sit-*m*). After that, the students will review the *m s l* song Birds Fly they learned from last class.

3. The teacher will show the same pictures of a giraffe, an elephant, and a pig. The teacher will remind students the Chinese names for these animals, and ask students to assign the correct solfege names for the three animals. After that, the teacher will introduce two new animals: bunny and mouse.

4. The teacher will first teach students the Chinese names for bunny and mouse, and then ask students to rank them based on their heights and compare their heights with the pig's height (see Figure 9). Once students put the animals in the correct order, the teacher will introduce *r* and *d*. The teacher will put *r* above the bunny and put *d* above the mouse, and sing these two notes with hand signs. Students will repeat after the teacher.

5. The teacher will write *d r m s l* on the staff, and tell students that the mouse, bunny, and the pig are very good friends so they always stay next to each other. Therefore, *d* is next to *r*, and *r* is next to *m*. The teacher will always say the animal names in Mandarin while also pointing at the corresponding pictures to strengthen students' memory of the new vocabularies. The teacher will then point at the pitches on staff and students have to sing the correct solfege with hand signs.

6. The teacher will ask students to put the *d r m s l* on their finger staff. The position of the starting pitch will be given, and the teacher will point at different pitches while students show the position of pitches on their fingers and sing. After singing each pitch pattern, the students also have to say the corresponding animal names. Students will then be

divided into two groups. One group will perform while the other group will listen and provide some feedback.

7. The teacher will sing Mary Had A Little Lamb with English texts to students. Students can sing with the teacher if they are familiar with the song. After that, the teacher will ask students what animal they hear in this song, the students will give the answer: lamb. Then the teacher will ask what color is the lamb and how does the lamb's fleece look like? The students will give the answer: white as snow. The teacher will then teach the words "lamb" "white" "snow" in Mandarin.

8. The teacher will speak the Chinese texts of Mary Had A Little Lamb phrase by phrase, and students will repeat after the teacher (see Figure 10). Then the students and teacher will speak the texts together. Once students get familiar with the Chinese lyrics, the teacher will play the recording and students can sing with the recording.

Assessment

1. During the class, the teacher will listen to the students sing *d r m s l* patterns to check whether they can sing the five pitches accurately. Students will also listen to each other and provide feedback for their peers.

2. During the class, the teacher will check students' hand signs and finger staff to ensure that they know the positions of *d r m s l* on staff

3. The teacher will listen to the students sing Mary Had A Little Lamb to check whether students can sing *d r m s* songs in tune.

4. The teacher will check students' mastery of the new Mandarin words by listening to the students speak the animal names.
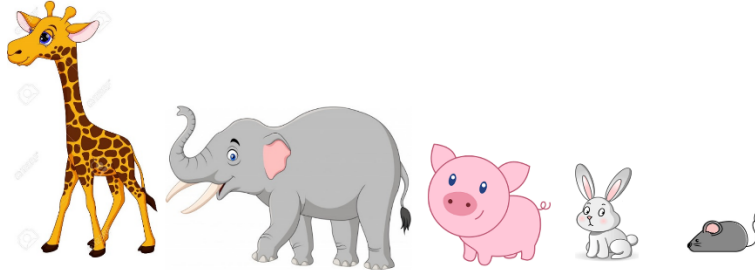
Figure 8 *Giraffe, Elephant, Pig, Bunny, and Mouse Represent l s m r d*

玛丽有只小羊羔 **Mary Had a Little Lamb**

Figure 9 *Score for* 玛丽有只小羊羔 *Mary Had A Little Lamb*

(Chinese version of Mary Had A Little Lamb)

Lesson Plan 10

Length of Class: 30 minutes

Class Setting: In the previous lessons, students learned *d r m s l* and their positions on staff. They also knew the hand signs for each note. In addition, students learned many animal names, such as elephant, pig, deer, mouse, and bunny in Mandarin.

Music Standards

Performing: Anchor Standard #5. Develop and refine artistic techniques and work for presentation.

Connecting: Anchor Standard #11. Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.

Mandarin Standards

Interpersonal Communication: Students engage in conversations, provide and obtain information, express feelings and emotions, and exchange opinions in Chinese.

Making Connections: Students reinforce and further their knowledge of other disciplines through Chinese language.

Products of Culture: Students demonstrate an understanding of the relationship between the products and perspectives of the cultures of the Chinese-speaking world.

Materials

Projector, music staff whiteboard

Objectives

a. Students will practice singing *d r m s l* patterns and identifying these five pitches on staff.

b. Students will sing *Mary Had A Little Lamb* on solfege names with hand signs.

c. Students will learn the unique pitch patterns in Chinese tunes by listening to one Chinese folksong and one Chinese pop songs that are composed in *d r m s l*.

Procedure

1. The teacher will lead a warm-up game: students will first follow the teacher's instruction and stretch their bodies to different directions. The teacher will then play the Chinese version *Ten Little Indians* and students can walk with the music to any directions. When the music stops the teacher will randomly say a direction in Mandarin. Students need to make a pose towards that direction and freeze until the music starts again.

2. The teacher will use hand signs to show students some *d r m s l* patterns, and students sing on solfege names with hand signs. Then the students sing some *d r m s l* patterns while pointing at the notes on their finger staff. After that, students will take turns to be the leader and use hand signs to give a new *d r m s l* pattern, and the rest of the students will sing together with hand signs.

3. The students will review Mary Had A Little Lamb in Mandarin. After that, the teacher will write d r m s on staff and ask students to figure out the solfege names for the four notes. Once students have the correct answer, the teacher will show students the music for Mary Had A Little Lamb, and the teacher will ask individual student to sing on solfege phrase by phrase. When the individual student is singing, other students will listen and check if that student is singing correctly. After that, all the students will sing on solfege names and then sing on Chinese texts.

4. Students will pair up and share a xylophone with only *d r m s l* 5 pitches. The teacher will first ask students whether this instrument is pitched or unpitched. Once students have the correct answer, the teacher will tell students the first pitch to the left is d, and then students have to figure out the rest of the pitches by themselves. If students have

difficulties identifying the pitches on the xylophone, the teacher will point at the *d r m s l* scale on the whiteboard and use Mandarin to describe their positions.

5. The teacher will sing some *d r m s l* patterns while playing the xylophone, and students will follow the teacher. After that, the teacher will let students to improvise some melodies using their xylophone. Students will play their own melodies and the teacher will add a piano accompaniment.

6. The teacher will tell students that many traditional Chinese music and Chinese folk songs are composed with only *d r m s l* five pitches. Then the teacher will show students two famous Chinese tunes: Jasmine Flower (Chinese Folk song) and Blue and White Porcelain (Chinese pop song composed in traditional Chinese music style).

Assessment

1. During the class, the teacher will measure students' mastery of *d r m s l* by asking them to sing with hand signs and pointing the notes on the finger staff,

2. The teacher will listen to students sing Mary Had A Little Lamb in Mandarin to check their pitch accuracy and their Mandarin pronunciation. Students will also listen to each other and assess their peers' performance.

Chapter 5: Discussions

Purpose of the Practicum

The purpose of this practicum was to create 10 lesson plans that use music to teach Mandarin pronunciation, listening comprehension, and syntax. The goal of these lessons was to improve students' Mandarin communication skills and develop music skills simultaneously.

In order to develop the lesson plans, I first examined studies that combined music teaching with language teaching (Coyle & Gracia, 2014; Davis & Fan, 2016; Gromko, 2005; Li & Brand, 2009; Piro & Ortiz, 2009; Ray, 1997). I adapted the teaching strategies and teaching materials in these studies to my lesson plans. I also visited an elementary school which offered a Mandarin immersion program. I observed one music lesson and one Math class taught in Mandarin. In each class, I took some notes of the instructor's teaching strategies and teaching materials. After that, I conducted interviews with the music teacher and the Mandarin teacher respectively. The purpose of these two interviews was to further understand how music and Mandarin were taught in American elementary schools, and how these two subjects could be incorporated into one class.

Once I had all the information, I developed 10 lesson plans. These lesson plans were divided into two units. In the first unit, students started with identifying four different Mandarin tones, which provides the foundation of Mandarin word pronunciation. Students explored the four tones by speaking the numbers from 1 to 10 in Mandarin. They also connected high/low linguistic tones with high/low musical pitches. Through speaking numbers, students also developed their knowledge in rhythm and steady beat. In the second unit, students learned different musical pitches and Mandarin animal

vocabulary words. In these lesson plans, I used Chinese children's songs as the primary teaching materials. These songs contained simple lyrics, rhythms, and pitches, which matched students' music and Mandarin levels. In addition, the songs I chose were familiar tunes with new Mandarin lyrics, such as Bounce High, Bounce Low (adapted to Birds Fly 小鸟飞), Cuc-coo, where are you? (adapted to 小鸟，你在哪?), and Mary Had a Little Lamb (Chinese version: 玛丽有只小羊羔). Through teaching those songs, students could learn the targeted musical concepts, such as *s m* and *ti-ti ta*, while also increasing their Mandarin vocabulary.

Implications for Future Study

Pedagogical Implications

Although researchers have identified a close relationship between music learning and language learning (Deutsch et al., 2006; Eterno, 1961; Luckett, 1996; Morgan, 1992; Peng et al., 2013; Pfordresher & Bowen, 2009; Piro & Ortiz, 2009; Sleve and Miyake, 2006), resources for combining music teaching and language teaching are still very limited. This practicum developed 10 lesson plans for beginning level music and Mandarin learners. The teaching methods and teaching materials were designed for younger students, mostly from six to seven years of age. Therefore, in order to offer music and Mandarin interdisciplinary courses for students at different levels, more age-appropriate resources should be developed. Music teachers and Mandarin teachers in American schools can cooperate more closely in the future to explore teaching materials that have value for both music teaching and Mandarin teaching.

In addition, in order to increase teachers' competence and confidence for implementing such music and language interdisciplinary curricula, teacher preparation

programs should offer pre-service teachers courses to develop their knowledge and skills in both music and language domains. Pre-service music teachers should have opportunities to learn different languages so that they can enrich their repertoire. Pre-service language teachers should also have access to a variety of music courses to develop their musical skills so that they can incorporate music in their future classes.

Research Implications

The effect of the 10 interdisciplinary lesson plans on students' development of both musical skills and Mandarin proficiency should be tested in the future. For example, researchers may compare students who take these10 lessons with students who learn the same Mandarin words without any songs and musical activities. Through this, researchers can test the effect of songs and musical activities on students' Mandarin acquisition. In addition, since the 10 lesson plans also aim to help students to improve their musical skills, further studies can be conducted to test

students' development of musical pitch accuracy and mastery of music knowledge after participating in the 10 interdisciplinary lessons.

It is also worthwhile to investigate students' attitudes towards taking such interdisciplinary courses. Researchers may conduct interviews with students, their parents, and interdisciplinary teachers to better understand the effect of the interdisciplinary lessons on students' motivation for learning both Mandarin and music. The long-term goal of developing a Mandarin and music interdisciplinary course is to encourage students to explore a different language and musical culture. Therefore, students' learning experiences should be monitored at each stage.

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Appendix A: Standards for Chinese Language Learning (2016)[1]

Communication

Interpersonal Communication

Standards 1.1: Students engage in conversations, provide and obtain information, express

feelings and emotions, and exchange opinions in Chinese.

Interpretive Communication

Standards 1.2: Students understand and interpret written and spoken language on a variety

of topics in Chinese

Presentational Communication

Standards 1.3: Students present information, concepts, and ideas to an audience of

listeners or readers on a variety of topics

Cultures

Practices of Culture

Standards 2.1: Students demonstrate an understanding of the relationship between the

practices and perspectives of the cultures of the Chinese-speaking world.

Products of Culture

Standards 2.2: Students demonstrate an understanding of the relationship between the

products and perspectives of the cultures of the Chinese-speaking world.

Connections

Making Connections

Standards 3.1: Students reinforce and further their knowledge of other disciplines

through Chinese language.

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[1] For my study, I focused on Communication and Connections.

Acquiring New Information

Standards 3.2: Students acquire information and recognize the distinctive viewpoints that are only available through the Chinese language and its cultures.

Comparisons

Language Comparisons

Standards 4.1: Students demonstrate understanding of the nature of language through comparisons of the Chinese language and their own.

Culture Comparisons

Standards 4.2: Students demonstrate understanding of the concept of culture through comparisons of the Chinese cultures and their own.

Communities

School and Community

Standards 5.1: Students use the Chinese language both within and beyond the school setting.

Life-long Learning

Standards 5.2: Students show evidence of becoming life-long learners by using the Chinese language for personal enjoyment and enrichment.

Appendix B: National Core Art Standards (2014)[2]

Creating

- Anchor Standard #1. Generate and conceptualize artistic ideas and work.

- Anchor Standard #2. Organize and develop artistic ideas and work.

- Anchor Standard #3. Refine and complete artistic work.

Performing

- Anchor Standard #4. Select, analyze and interpret artistic work for presentation

- Anchor Standard #5. Develop and refine artistic techniques and work for presentation.

- Anchor Standard #6. Convey meaning through the presentation of artistic work.

Responding

- Anchor Standard #7. Perceive and analyze artistic work.

- Anchor Standard #8. Interpret intent and meaning in artistic work.

- Anchor Standard #9. Apply criteria to evaluate artistic work.

Connecting

- Anchor Standard #10. Synthesize and relate knowledge and personal experiences to

  make art.

- Anchor Standard #11. Relate artistic ideas and works with societal, cultural and

  historical context to deepen understanding.

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[2] For my study, I focused on Creating, Performing and Connecting.

Appendix C: Cover Letter to the Elementary Mandarin Teacher

Dear XXX (Mandarin teacher's name),

My name is Tracey Shi and I am currently studying in the Master of Music Education (MME) program at Indiana University Bloomington. One of the requirements for MME students to graduate is to conduct a research/practicum project in music education. My project is developing lesson plans that use music to teach Mandarin in elementary schools. I am writing you this letter to ask if I can observe one of your Mandarin classes and have a short interview with you after class. Thank you for your cooperation.

Sincerely,

Tracey Shi

Appendix D: Interview Questions for the Elementary School Mandarin Teacher

a. What Mandarin teaching standards do you concentrate on in your class?

b. What materials do you use in order to meet these standards?

c. Do you use music to teach Mandarin?

d. Have you ever collaborated with the music teacher when introducing music (songs) into your class?

Appendix E: Cover Letter to the Elementary School Music Teacher

Dear XXX (music teacher's name),

My name is Tracey Shi and I am a first-year graduate student studying music education at Indiana University. I am writing my MME practicum proposal this semester and my research topic is designing interdisciplinary lesson plans that use musical ways to teach Mandarin. Since I want to combine music teaching with Mandarin teaching, I am also very curious about how music is taught at US elementary schools and whether you teach any songs in different languages, especially in Chinese. May I observe one of your classes and have a short conversation with you? Thank you very much.

Sincerely,

Tracey Shi

Appendix F: Interview Questions for the Elementary School Music Teacher

a. Have you ever taught songs in other languages, especially Mandarin?

b. What kinds of songs in other languages do you usually introduce to your students?

c. How do you teach songs in other languages?