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THE IMPACT OF A COGNITIVE MODEL OF INSTRUCTION AND LEARNING INFLUENCED BY THE KODALY CONCEPT ON DICTATION SKILLS OF EXPERT MUSICIANS

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Synopsis:

Teacher professional development for a method of teaching and learning music based on Zoltan Kodály's philosophy is described. Results of teacher improvement in the ability to perform music dictation and implications for teaching are discussed.

The Impact of a Cognitive Model of Instruction and Learning Influenced by the Kodály Concept on Dictation Skills of Expert Musicians

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Abstract

The research question for this study was, "Does a cognitive model for teaching music notation that is shaped by the Kodály Concept, enhance music dictation skills?" Pre and post test data revealed that teachers (N = 66) improved their notation ability after learning and using tools and techniques associated with the Kodály Concept and a cognitive model of instruction and learning. Overall Hedge's *g* effect size was 0.498 ($p < .01$) with CI [0.151, 0.844]. A structured approach to teaching music notation could be an effective pedagogical approach to improving dictation. Understanding the process for translating known and unknown melodies into notation can be improved by the use of kinesthetic activities, aural analysis, the use of pre-notation, and learning how to sing known and unknown melodies with rhythm and solfège syllables as well as hand signs.

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Keywords: Music, Kodály Concept, musicianship, dictation, sound to symbol, audiation

Research in the field of in-service music education reveals that there is an over emphasis on the presentation of topics that relate to pedagogy and a lack of topics that relate to the development of performance and musicianship skills of music teachers (Bowles, 2002; Friedrichs, 2001; Houlahan, Nite, Tacka, & Moreno, 2015; Tarnowski & Murphy, 2003). For example, a content analysis of the MENC Conference documents a 42% decrease in performance-oriented sessions from 1984 to 2000 (Price & Orman, 1999; Price & Orman, 2001). Music teachers generally ascribe to the notion that music making and music teaching are inextricably linked together in the music classroom and they "intersect to form and inform the music teacher and positively influence student learning in a multitude of ways" (Pellegrino, 2011, p. 88). Often music teachers do not recognize the important role of their own musicianship skills in the effectiveness of their classroom teaching. We believe that development of a teacher's musicianship skills are of paramount importance and our research indicates that it can impact student learning in the classroom (Nite, Houlahan, Tacka, & Moreno, 2015). Audiation plays a central role in the improvement of teacher's musicianship, especially if audiation is enhanced by a structured approach to teaching dictation skills.

Program Description

Music teachers have the possibility of obtaining Kodály Certification. This certification is usually offered as an inservice professional development opportunity, accredited by the Organization of American Kodály Educators (OAKE), obtainable over three to four years and includes more than six weeks of intensive musicianship and pedagogy training. The Kodály

Concept of music education is based on the philosophical writings of Zoltán Kodály, a world-renowned composer and music pedagogue (Laszló, Houlahan, & Tacka, 2003). Choksy (1974), Houlahan and Tacka (1990a, 1990b, 2008) are the primary architects of the American adaptation of the concept for the United States. Although Kodály never developed a methodology for teaching music, his philosophical and pedagogical contributions to the field of music education have become known as the Kodály Concept or Kodály Method of music education.

Kodály believed that a music education, regardless of the age of the learner, should begin with the selection of both folk and art music, as it is best suited to the physical, developmental, and psychological needs of the learner. He believed that folk songs ought to form the basis of developing musicianship because of their simplicity, beauty, and heritage; they also provide an essential bridge to understanding the finest art music. Folk songs are memorable because of the simple forms and repeated rhythmic and melodic patterns. The Kodály Concept promotes beginning the study of music literacy with rhythmic and melodic patterns drawn from the folk songs students are learning. Teaching techniques include the use of the moveable *do* system of solmization (referred to as relative solmization), the use of hand signs associated to each note of the scale, and rhythmic syllables.

During an intensive summer program, participants have the opportunity to develop their knowledge of music theory, analysis, harmony, conducting, music literature, choral conducting and pedagogy. Special attention is paid to hearing, memory, singing, aural analysis, developing fluency with solfège and rhythm syllables as a means of enhancing audiation, notation, and dictation skills in music theory classes. Musicianship skills are developed through the performance of repertoire, the primary focus being on *acappella* singing. The skills of music performance and music theory through performance are further refined through sight singing and music dictation. Repertoire is performed with rhythm syllables, solfège syllables, and hand signs.

The instructors in the Texas Kodály Certification program did not use the rhythm syllables created by Émile Chevé (1804-1864 a French music theorist and pedagogue) and originally adopted by Hungarian music teachers. Instead they used the *Takadimi* system of rhythm pedagogy as a replacement for the Chevé system as it emphasizes the location of a sound within a beat (Houlahan & Tacka, 2011).

Kodály was convinced of the importance of singing with solfège syllables. Students are taught how to sing using the moveable *do* system of solfège singing, where *do* is the tonic in major and *la* is the tonic in minor keys. Music examples are sung with solfège syllables and accompanied with hand signs, a process that facilitates music audiation. Hand signs are used to illustrate the notes of the scale (solfège syllables) and were developed by John Curwen in 1862. Hand signs physically and visually help orient students to intervallic relationships as well as aid in developing inner hearing or audiation (Forero-Hordusaky, 2012). The kinesthetic movement of the hand (hand signs) associates a pattern of bodily experience with a pattern of music. We enhance cognition by embedding a pattern of movement with a melodic pattern. Students connect known musical elements, concepts, and skills by singing known songs with rhythm syllables, solfège syllables, and hand signs (Houlahan & Tacka, 2005). Particular consideration is given to developing students' singing, sight singing and dictation skills. Teachers developed their knowledge of music pedagogy, music repertoire and folk song analysis in methodology and folk song analysis classes. Choral and instrumental music teachers at the PK-12 level in the program were participants in the study. Unlike other programs in the United States, participants attending the Kodály Certification Program at Texas State University were instructed by Houlahan and Tacka, who have developed an innovative model of learning and instruction for

developing music literacy and musicianship skills that is enhanced by the Kodály Concept (Houlahan & Tacka, 2011).

Methodology

The same testing protocols were used in this study as outlined in the authors' 2015 study (Houlahan, Nite, Tacka, & Moreno, 2015). However, the data in this study (N = 66) includes scores from two years of professional development. Participant teachers were asked to perform the following tasks for the song "Happy Birthday": a) notate the pitches for the melody with standard musical notation, b) notate the rhythm with their own choice of nonstandard graphic notation, c) notate the rhythm with standard rhythm notation, d) notate the pitches with their own choice of nonstandard graphic notation, and f) notate the song on the staff. Each participant's response was scored, using a rubric the researchers developed. Elements of the rubric each consisted of integers values 1, 2, 3, and 4, with 4 being the highest score. Cronbach's alpha on both pre- and post-test scores was calculated to check the reliability of the data. Content validity was determined through an expert review panel from universities and a K-5 campus.

Results

Internal reliability

Cronbach's α was calculated on both pre and post test scores. For the pre test, $\alpha = .873$ and for the post test, $\alpha = .884$, indicating a high reliability of scores.

Content validity

An expert panel examined the instrument and confirmed that it was valid; measuring what it purported to measure. The expert review panel included one K-5 music teacher and three university faculty from two different institutions, with two Kodály-certified educators in the group of four.

Effect sizes and confidence intervals

The mean pre-test scores for each item and for the total score increased, and all but one of the increases were statistically significant at the 95% confidence level ($p \leq .02$). The mean difference for graphic pitch notation was not statistically significant. The means, standard deviations, and *p*-values for the mean difference are shown in Table 1. In most cases, the S.D. for the post-test was lower than the S.D. for pre-test, indicating that the training decreased the gaps in knowledge for students in the course.

Table 1.
Pre- and post-test means and standard deviations

Measure (n = 66)	Pre-test Mean [S.D.]	Post-test Mean [S.D.]	Mean Difference p Value
Standard Pitch	3.00 [1.030]	3.50 [0.827]	$p < .001$
Standard Rhythm	2.95 [0.908]	3.33 [0.791]	$p = .001$
Standard Notation	2.74 [0.771]	3.11 [0.825]	$p < .001$
Graphic Pitch	2.95 [0.916]	3.14 [0.893]	$p = .061$
Graphic Rhythm	2.89 [1.811]	3.20 [0.789]	$p = .002$
Graphic Pre-Notation	2.80 [0.749]	3.06 [0.821]	$p < .002$
Total Score	17.33 [4.083]	19.33 [3.935]	$p < .001$

The Hedge's *g* effect sizes and 95% confidence intervals for the five statistically significant results are given in Table 2.

Table 2.
Hedge's g effect sizes

Measure	Hedge's *g*	Confidence Interval for Effect Size
Standard Pitch	0.532	[0.185, 0.879]
Standard Rhythm	0.444	[0.098, 0.789]
Standard Notation	0.461	[0.115, 0.806]
Graphic Rhythm	0.221	[-0.122, 0.563]
Graphic Pre-Notation	0.329	[-0.015, 0.672]
Total Score	0.498	[0.151, 0.844]

The mean for the 24-point pre test scores was 17.33 (SD = 4.083) and the post test mean was 19.33 (SD = 3.935). Figure 1 illustrates the means and 95% confidence intervals for the means of the pre test and post test.

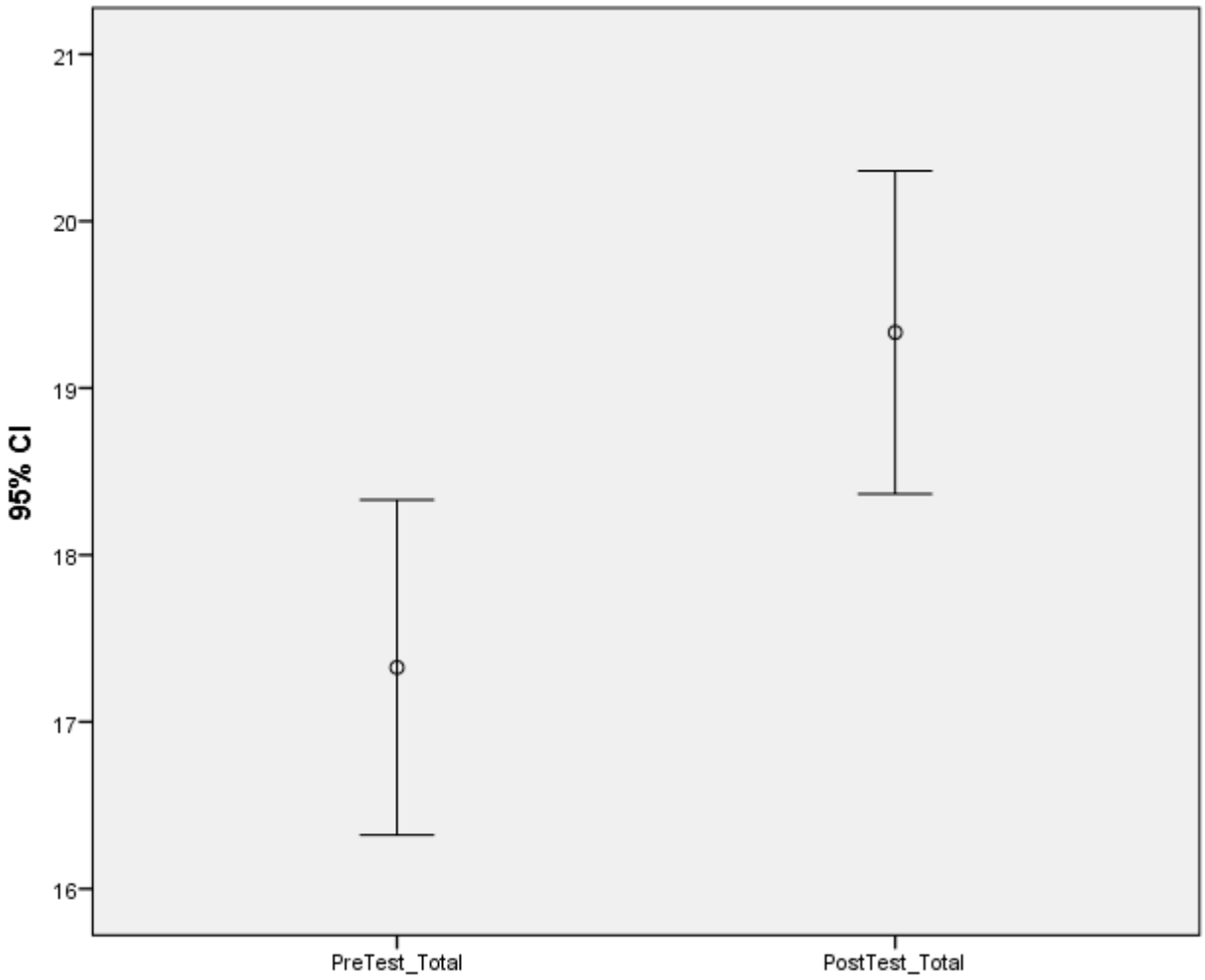

Figure 1. Error bars (95% CI) for pre test and post test scores

The Hedge's *g* effect size for the change in scores from pre test to post test was statistically significant at $g = 0.498$ ($p < .01$), indicating a substantial degree of improvement over the course of the professional development. The 95% confidence interval was [0.151, 0.844].

Discussion

The goal of this study was to understand how a cognitive model of learning and instruction, shaped by the Kodály Concept of Music Education could impact the skill of notating known melodies and to use this data to improve the skills of dictation, notating unknown melodies. This study builds on the work of Davidson, Scripp and Welsh (1998) as well as Karpinski (1990).

Teachers made statistically significant improvements in notating a known melody, *Happy Birthday* from the pre-test to the post-test as a result of employing a "sound to symbol orientation" that places special emphasis on singing, memory, aural analysis, creating a visual representation of the melody using pre-notation skills, and showing the understanding of music by labeling sounds and pitches using rhythm syllables (*Takadimi* system) and solfège syllables (moveable *do*; *do* is tonic in major and *la* is tonic in minor), before notating melodies in staff notation.

Data from this study reveal that teachers improved significantly in their ability to notate known melodies using a cognitive model of learning of instruction along with pedagogical tools and techniques associated with the Kodály Concept (Houlahan & Tack, 2008). It appears that teachers develop dictation skills by; 1) becoming familiar with a body of repertoire that shares similar stylistic elements i.e., formal, rhythmic, and melodic building blocks, 2) folk songs are ideal for teaching dictation skills because they are singable and easy to memorize, 3) using melodies for dictation that include variants of known melodies helps to consolidate and practice the skills of dictation 4) relearning music fundamentals through a "sound to symbol" pedagogy. The advantages of the above observations enable teachers to experience the "sound to symbol" process for relearning the fundamentals of music and this serves as a pedagogical model to use in their own classrooms (Junda, 1994).

During the intervention period, students acquired the ability to memorize and sing known and unfamiliar repertoire that shared similar stylistic characteristics. Repertoire selected for musicianship classes contained common rhythmic and melodic building blocks. "By learning and thinking in terms of patterns, students are taught strategies for chunking and learn to practice higher level listening skills. They come to regard rhythm as identifiable and interrelated units of sound rather than a simple stream of attack points" (Hoffman, Pelto, & White, 1996, p. 29). To expand and develop rhythmic knowledge, students were guided to perform music examples with text, perform the beat, clap the rhythm, and describe the number of sounds they performed on each beat. To expand and develop melodic knowledge, students were guided to identify music pitches in terms of high or low, identify which beats had the highest and lowest pitches, sing the range of pitches from lowest to highest and vice versa, and create a pre-notation picture of the music being studied. The instructor would then associate the sounds on each beat with rhythm syllables; pitches in a four beat pattern were connected to solfège syllables and Kodály hand signs. Once students could sing known repertoire fluently with rhythm and solfège syllables, the instructor would then show students a process for notating these melodies on the staff. It appears that the use of various pedagogical tools can improve music notation (Foulkes-Levy, 1998; Foulkes-Levy, 1997; Grutzmacher, 1987; Huenink, 2002; MacKnight, 1975; Potter, 1990; Telesco, 1991).

Our research indicates that students must be able to sing a melody in tune while attending to the musicality of their performance; their musicality appears to enhance their ability to sing the melody internally. Prior to writing, the instructor should consider asking students guiding questions that focus attention on the position of notes within the phrase. Guiding questions serve the development of audition. For example, when the instructor asks students to identify the number of sounds on a particular beat in a phrase, the students demonstrate their ability to audiate the melody in order to answer the question. Creating a pre-notation picture of a melody provides instructors with an indication of the students' ability to correctly audiate the melody. If students cannot create a picture of the melody using a type of pre-notation, the instructor will be uncertain as to application of rhythm and solfège syllables used to aurally label sounds. Labeling a melody using rhythm and/or solfège syllables as well as hand signs allows students time to aurally understand a melody. Demonstrating aural understanding appears to be a critical precursor to written notation and it provides the instructor with an indicator of student success. This process of instruction can be described as a "sound to symbol orientation" to teaching.

Results of this study suggest that teaching music notation of known and unknown melodies through a sequential sound to symbol orientation could affect students' ability to internalize (audiate), and subsequently sight sing music. The ability to notate music as a result of

a sound to symbol orientation to teaching can impact a teacher's own musicianship in significant ways. For example, a teacher who has developed the ability to audiate a music score can communicate this understanding to their students in a more thoughtful and musical manner. Likewise, teachers who have developed the ability to audiate and notate melodies improve their own abilities to read known melodies and sight sing melodies more musically. This occurs as a result of their demonstrated expertise using rhythm and solfège syllables to audiate melodies.

Further study might include how the acquisition of music literacy skills, using a model of learning instruction that is shaped by the Kodály Concept, could impact dictation of unknown melodies. The process developed for notating known melodies could be applied to the notation of unknown melodies. It might also be valuable to look at using variants of known melodies and using them for dictation purposes.

Another area of research might investigate how the model of learning and instruction used in this research can be used for teaching sight singing skills. The Kodály Concept is an effective approach to teaching sight singing (Nite, Houlahan, Tacka, & Moreno, 2015). It is interesting to note that this research points to the fact that students might begin to develop their skills of sight singing by learning how to notate known melodies. Once these melodies are notated the student can read them using a variety of tools including rhythmic and melodic solfege as well as numbers of counting and singing with absolute pitch names. Once students develop a fluency notating and reading known melodies, the instructor may introduce variants of this material so that students can practice sight singing skills.

While this paper endorses Gary Karpinski's (1990; 2000) perceptual model for developing dictation skills, it also supports the adoption and integration additional steps associated with the Kodály Concept and the Houlahan and Tacka cognitive model of learning and instruction (Houlahan & Tacka, 2011).

In summary we can make the following observations about teaching dictation skills in the Texas Kodály Certification Program Summer Course.

- Singing plays a major role in the curriculum.
- Developing aural awareness (ability to hear music without any acoustical help) is embedded into the process of teaching musicianship and dictation skills.
- Teaching tools such as rhythmic and solfège syllables and hand signs are used to develop aural awareness, reading, and dictation skills.
- Students enhance their knowledge of singing and music theory by singing a repertoire that includes both folk songs and art music.
- Musical examples selected for teaching are condensed into basic rhythmic and melodic patterns or "building blocks" that are most often presented in four or eight beat patterns.
- The teaching process begins with simple musical examples and progresses to more difficult examples.
- As the music examples become progressively more difficult, they include both known and unknown building blocks.
- The teaching pedagogy associated with the Texas programs includes all age groups.
- To experience the model of learning and instruction used in this program, participants relearn the fundamentals of music through the "sound to symbol" approach delineated above.

Implications for Teaching

Audiation is an essential music skill for musicians, and it appears that there is a significant connection between the ability to audiate and the ability to take musical dictation. This research supports the adoption of current perceptually-based models of instruction for developing dictation skills that also include tools and processes associated with the Kodály Concept of Music and a "sound to symbol" orientation to teaching. Music teachers were taught to sing, memorize, and stylistically perform a collection of folk song repertoire that shared similar stylistic elements. The repertoire used for teaching was analyzed and a sequence was developed for teaching rhythm and melodic elements. This repertoire was presented to form the basis of the participants own classroom instruction. Much of the same repertoire was also used for developing the participants music literacy, improvisation and listening skills. For each element taught, the participants had to sing the song fluently, aurally identify the number of sounds on each beat, aurally identify the range of notes used in a melody, and sing the range of pitches from lowest to highest. To maximize the participants' audiation skills, the instructor asked a sequence of questions about the music element that required the participants to audiate, (sing the melody in their heads) before answering each question. The participants were then asked to create a visual representation of the new element occurring within a four beat pattern and identify all known elements. Once teachers gained fluency with this process, the instructor introduced the notation for the known melody on the staff. Participants reinforced their sight singing skills by singing this notated repertoire with rhythm syllables, solfège syllables and hand signs.

We are proposing the following (Herboly-Kocsár, 2004; Houlahan & Tacka, 2005; Houlahan & Tacka, 2012):

1. Music performance is at the heart of learning. Music knowledge should be derived through singing. Singing can be understood to also include the ability to internalize or inner hear a musical score.

2. It appears that teachers develop dictation skills by learning a song repertoire that can be used for the development of their own dictation skills and in their own classrooms.

3. The initial introduction of all musical elements can be taught through simple music examples that are easily learned and help scaffold future study. Students learn to combine and manipulate simple musical elements to read, write, improvise, and compose.

4. Many instructors have dismissed simple music examples, such as folk songs, as being unsophisticated and not appropriate for developing aural awareness in older students. We have been able to successfully use these examples with students of all levels including those attending very elite liberal arts universities. The concept of repeatedly using simple musical examples is connected to cognitive schema theory; it provides us with the ability to *think* about a new element, to *associate* traditional forms of notation with the element and to *assimilate* this information.

5. Music dictation skills need to be practiced with other music skills such as singing, memory, audiation, music reading and writing, music improvisation and composition as well as music listening.

6. Music instructors should consider selecting appropriate repertoire for developing music skills.

7. Instructors need to deconstruct musical material into melodic and rhythmic building blocks and have students enact them in way that they become reconstructed so that the musical knowledge becomes operational for them.

8. In order to become fluent writing known and unknown melodies, students need to learn how internalize music, aurally analyze music without reference to notation, create a representation of a rhythmic or melodic element using their own intuitive notations, learn how to describe music with rhythm or solfege syllables without reference to notation and learn how to notate music.

9. Students need to practice reading known melodies with rhythm syllables, solfège syllables and hand signs as well as neutral syllables. It is also important for students to be able to memorize these examples for successful staff notation.

10. The instructor needs to include variants of known melodies for dictation practice as these provide students with music scaffolding and this helps student's ability to notate unknown music examples.

11. It is important for students to practice a variety of dictation techniques. Herboly-Kocsár presents several different scaffolding techniques (2004). For example, students could notate known and unknown melodies on the staff as well as play these melodies on the piano to demonstrate their dictation skills

12. Students should be given the opportunity to memorize exercises that can be connected to dictation as memory plays an important role in accurate singing and the ability to recall a pattern for the purposes of dictation. There are several forms of memory: a) memorizing from hand signs, b) memorizing from a score, c) memorizing by ear.

13. Students cannot notate unknown melodies if they cannot inner hear these melodies. Our research indicates that the ability to accurately write known melodies from memory should proceed taking dictation of unknown melodies.

We believe that striving to include these principles in music instruction will improve the quality of the instruction and broaden the knowledge and ability of music teachers and their students. In addition, the beauty and enjoyment of music will be enhanced.

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