
Using music content as pedagogy across the school curriculum

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Introduction

All human cultures have music-hence, music is a universal feature of the human experience. This universality is manifest especially in young children since they have a natural inclination to express themselves through singing, playing instruments, and dancing. Children are surrounded by music throughout their daily lives, including experiences in cultural, social, and technological interaction. Recent research supports an interactive and experiential process of learning spoken and written language skills that begins in early infancy with music and rhymes. As educators, it is important for us to know that music can be a powerful tool in the learning experience (Salcedo, 2010). Language and communication are also universal, and they share a connection with music (Salcedo, 2010). Studies have shown that [early childhood] literacy is naturally developed through music (McIntire, 2007). Teachers of young children need to consider using singing, playing of musical instruments and dancing, in their efforts in knowledge dissemination. Hutchinson and Huberman (1994) define knowledge dissemination as:

...the transfer of knowledge within and across settings, with the expectation that the knowledge will be “used” conceptually (as learning, enlightenment, or the acquisition of new perspectives or attitudes) or instrumentally, (in the form of modified or new practices. (p.27)

Music is universal in humans and especially in children since children from all cultures have a natural inclination to express themselves through music (Salcedo, 2010). Language and communication are also universal, and they share a connection with music (Salcedo, 2010). Studies have shown that literacy is naturally developed through music (McIntire, 2007). Music as being central to the constitution of individual and cultural identities, and to develop cohesion and creativity (Pérez-Aldeguer, 2013).

Infants come into the world with an innate receptivity to music and movement. Research suggests that music has a positive effect on all developmental domains. Music

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nourishes the brain by building neural pathways through stimulation from all five senses. Singing with a baby, for instance, stimulates both sides of the brain. Opportunities for social competence and emotional well-being are created during such musical activities. With hearing being the second sense to develop in utero, the “baby dance” begins early. Immersed in sounds and rhythms, babies are seemingly pre-wired for music. They are born ready to move and expecting to dance.

Music strengthens learning across the curriculum

The idea of curriculum integration is an ancient and complex one. However, the concept of bringing subjects such as music and the arts into other areas of the curriculum has been under discussion for the last half-century, off and on, with a resurgence occurring over the past decade. From time to time, many music teachers have been asked to establish a linkage between what they teach and what is taught in other curriculum areas. This brings to mind many questions, for instance, as to what would be the delineation of math from music, science from music, music from geography and so on. Wiggins and Wiggins (1997) also raised the same concerns by stating that “...singing the mathematical tables does not constitute a music lesson” (p. 38)¹. To justify this, they further observed that singing a song about civil war may not involve students in learning musical concepts (see p. 38). In their view, the most logical way to make connections among the fields of knowledge is not to connect the fields themselves, but rather to connect the ways in which we come to understand the various fields².

The visions of bringing educational concepts together stem from an understanding that what the various fields of knowledge share as their common root is the human mind³. Having said so, then how would we justify the use of music and the arts in other areas of the curriculum to enhance teaching and learning? There is a body of brain research that supports the notion that learning is best accomplished when information is presented in meaningful, connected patterns. This includes interdisciplinary studies that link multiple curricular areas (Lake, 1994).

It has been observed that music is good for the mind and for our physical, emotional, and spiritual health. Music strengthens the mind, unlocks the creative spirit, and affects the physical body. The modern educational approach of bringing music and the arts into other areas of the curriculum can be compared with ancient models. For example, primitive man used music in many different ways. Music was a vital means of communication. People in Africa sent messages by blowing a horn, or playing on the drum for the neighbors to hear their messages. Music has been used during times of war for communication. It has also been used to encourage soldiers, bring them to order, lift their morale during

¹ Wiggins and Wiggins: Integrating Through Conceptual Connections, MEJ, September p. 38.

² Ibid p. 40

³ Ibid p. 40

sad moments to soothe those in somber moods, and to teach the soldiers new tactics. Is it not therefore this legendary, multifaceted meaning of music that music educators have brought to this age? Is it not for its sublime entity that whenever educators want to attain a goal, they invite music into their pedagogy? Or, is it not for music's sonic quality that transcends man's reasoning as to how it makes every human being respond to it when s/he can no longer respond to any other stimulus? These are just some of the questions that come to my mind when I ask myself for a justification of using music in other areas of the curriculum and removing it from its commonplace context.

More recent research has shown that music has a great effect on the human being. Such areas as emotions, respiratory system, heart rate, posture and mental images have been found to respond effectively with music (Knight & Rickard, 2001; Ortiz, 2002; Bernardi *et al.*, 2006; Rauscher, 1999; Akombo, 2013). If the foregoing argument is true, and if such physiological parameters are all a factor of effective learning, then it is true to assert that music influences learning, and when used appropriately, the integration of music with other arts can help in cognitive development and general comprehension of subject matter.

In 1994, Lake observed that the integrated curriculum is a great gift to experienced teachers. It is like getting a new pair of lenses that make teaching a lot more exciting and help us look forward into the next century. It is helping students take control of their own learning⁴. In addition, Wiggins and Wiggins noted that "So long as this move toward integration raises the status of artistic thinking, and its role in the curriculum, arts teachers should welcome the opportunity to work together " (p. 38).

Bringing music and the arts into other areas of the curriculum can be viewed as one of the teaching styles of effective teachers. Morsh and Wilder (1954) have not found any specific, observable teaching style whose frequency or percentage of occurrence has invariably and significantly correlated with student achievement. Their observation was overruled by Lake (1994) when the author noted that when the arts are effectively used in the teaching style and connected to the rest of the curriculum, students understand all of their subjects, including music, better than they would if the arts were treated as a separate entity. In 1994, Hoffer, Abeles, and Klotman also noted that students differ significantly in the strategies they apply in solving the same problem (p.204). In my view, music seems to be a handy tool that can be used to address the learners' levels of preparedness.

4 Kathy Lake, "The integrated curriculum is a great gift to experienced teachers" In *Integrated Curriculum*. Courtesy of Northwest Regional Educational Laboratory. Accessed Decembers 27, 2016 from <http://www.curriculumassociates.com/professional-development/topics/Integrated-Curriculum/extras/lesson1/Reading-Lesson1.pdf>

Music and arithmetical relationships

Stevens, Sharp, and Nelson (2001) describe an activity in a fifth grade math class using the polyrhythm of Afro-Cuban drumming to teach the math concept of least common multipliers [multiples]. Rich mathematical content is inherent in African rhythms and embedded in drumming a given song; because of its mathematical complexities, African and Afro-Cuban drumming can be used to explore the concept of ratio through class discussion (Stevens, Sharp, & Nelson, 2001). The drummers' combination of many rhythms, each with a pattern repetition of different length, results in polyrhythmic song. The pattern repetitions were comprised of one quantity of one type of beat mixed with a specific quantity of another type of beat, or a ratio of one beat to the other one⁵.

As seen in Figure 1, the clave rhythm divides the rhythms into 3s and 2s, and when counting this particular rhythm, the children will add $3+2$ and get 5, hence their rhythm will be premised upon the "musi-RHYTHM-etic" pattern of $3+2=5$. By musi-RHYTHM-etic, I mean any musical rhythm pertaining to or showing arithmetical inclinations.

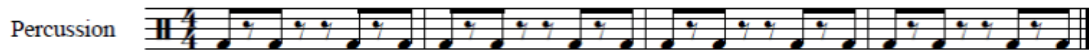


Figure 1. The clave rhythm patterns adopted from Dowrsky and Sansby (1994)



Figure 2. The bembe ostinato rhythm patterns adopted from Dowrsky and Sansby (1994)

As seen in Figure 2, the *bembe* ostinato rhythm divides the rhythms in into 2s and 3s; however, the rest of the beat makes it easy for the children to count $2+1$. Doing this four times gives the children the opportunity to count up to twelve as in $2+1$, and $2+1$, and $2+1$, and $2+1 = 12$.



Figure 3. The tumbao rhythm patterns adopted from Dowrsky and Sansby (1994)

⁵ Anthony C Stevens, Janet M Sharp, & Becky Nelson. "Ratios exist in nearly every aspect of children's lives, such as in comparing the number of hits with the number of times at bat, the number of red marbles with that of blue marbles, or the calories with tablespoons of sugar." In *The intersection of two unlikely worlds: Ratios and drums. Teaching Children Mathematics* 7(6), (2001), p.376.

As seen in Figure 3, the *tumbao* rhythm pattern is a continuous count of up to eight, thus 1,2,3,4,5,6,7,8. The children keep the time while counting. In a typical music session, the children learn to count each other's parts and in a cycle of a phrase, they can add the number of all the rhythm strikes they make on their instruments. This exercise becomes mathematically complex when they have to listen to the other overlapping sections. In essence every child will be able to determine the relationships between 8 beats, 12 beats and 6 beats. On teaching arithmetic with rhythm, in his *The Republic*, Plato eloquently postulated:

...There are three ratios of [meter], $3/2$, $2/2$, $2/1$, which have all their characteristics...as well as the rhythms...as well as of dactylic, trochaic, and iambic rhythms, which [the children arrange] so as to equalize the syllables with one another, assigning to each the proper quantity. (p.36).

Concerning the integration of the arts into the learning of mathematics, other components that could also be explored include comparing the instruments by using a variety of units of measurement such as inches, cubic feet, or pounds (the drum's length, volume, and weight, for instance). They could also construct their own drums, thereby exploring the concept of architectural similarity.

Other benefits of music to young children

Music helps to revive enthusiasm, express feelings, rejuvenate and be at the core of social connections formed between children. We know the importance of the social-emotional piece. Children can know their ABCs backwards and forwards, but if they don't have good social skills and emotional well-being, their ABCs may not serve them well (Ortiz, 2002).

Music has the ability to activate many different areas of the brain. In particular, it is seen to have its strongest effects on those areas involved in internal imagery, auditory perception, and motor functions (Sacks, 2008). This is achieved through what Sacks has termed, "brainworms" which he subsequently referred to as "cognitively infectious musical agents" (p. 42). These are musical sounds with distinctive musical shape, [having a] tonal or melodic oddness with perceptual constructions, created in the brain like sensory overstimulations (Sacks, 2008, pp. 44-46). Music has been found to activate the auditory cortex (Kraemer *et al.*, 2005).

Music provides nourishment for the brain and overall academic success

Case studies have reported the assessment of the academic success of school music students (Milley, Buchen, Oderlund, & Mortatotti, 1983). Rhythm students learned the concept of fractions more easily, and those students who learned rhythm notation doubled their scores on fractions tests. The 67 individual case studies showed that students' achievement in mathematics improved when arts were included in the curriculum. Michela (as cited in Kelstrom, 1998) also believed that studying music enabled students to learn

multiplication tables and mathematical formulas more easily. These findings indicated that music uniquely enhanced higher brain functions required for mathematics, chess, science, and engineering. Because neural connections were responsible for all types of intelligence, a child's brain developed to its full potential only with exposure to the necessary enriching experiences in early childhood (Hargreaves & Davis, 2000). Relationships have been found between participation in school music programs and standardized test results (Johnson & Memmott, 2006; Akombo, 2013).

Higher scores result because music helps to develop attentiveness. Music engages the areas of the brain involved with paying attention, making predictions and updating the event in memory. Listening to music could be a way that the brain sharpens its ability to anticipate events and sustain attention to tasks which is essential in test-taking. Researchers using functional magnetic resonance imaging (fMRI) repeatedly produce dynamic images which show the parts of the brain activated during a given musical activity. Memory is vital for learning. Research indicates that babies as young as eight months have shown recognition of a familiar piece of music after a two-week delay (Ilari & Polka, 2006). Providing consistent experiences with the same song (at the same time, such as nap time) helps young babies remember and link that music with a particular experience (Parlakian, 2010).

Research during the past decade has shown that when children are able to distinguish different sounds and phonemes, they do well in developing their literacy skills over time (Ehri *et al.*, 2001). Parlakian (2010) has noted that:

Moving different parts of a baby's body and encouraging toddlers to move their own bodies as you sing a song—for example, "Head, Shoulders, Knees and Toes"—helps them learn that these body parts do, indeed, belong to them (p.16).

According to music standards of the National Association for Music Educators (NAfME) for Pre-K through 8th grade, the learners are required to analyze the structure and context of varied musical works and their implications for performance. They achieve this by analyzing creators' context, and how they manipulate elements of music provides insight into their intent and informs performance. The essential question the NAfME requires music educators to ask is "How does understanding the structure and context of musical works inform performance?" (The NAfME, 2016). By attempting to answer this question, the children get to understand the musical contexts from around the world, thus informing them of these global cultures. There are many different benefits from studying and performing African repertoire in its authentic form. Hopton-Jones (1995) states that:

By learning something about how music interacts with the culture from which it springs, students can start to gain a better understanding of the people of the culture. This is the principle goal in developing cultural sensitivity..." (Hopton-Jones, 1995, p.26).

The enhancement of global understanding through music

There are four aspects of African music that I will focus upon: text, melody, rhythm, and movement. One of the constant ideals in African music is that the text leads the music. “Musical sounds are derived from the sounds of the language... [and take] precedence over the music,” (Hopton-Jones, 1995, p.27). African music relies heavily upon storytelling and the melody is based upon the sounds that would normally be heard in the language itself. Hopton-Jones also states that due to the close relationship of text and language, it is a natural occurrence to think of the music “horizontally, by focusing on the melody as a single line.” In regard to rhythm, polyrhythmic textures are often utilized. Syncopation and hemiola techniques are used frequently in African music (Hopton-Jones, 1995, p.28). Much of the music is written in 6/8 meter in order to best accommodate syncopation and complex rhythms (Hopton-Jones, 1995, p.28). Movement is determined by the type of music that is being played or sung as well as the event for which the music is performed. Specific dances are performed for different *ngomas* or traditional ceremonies. These dances are often passed down from generation to generation. During singing competitions, groups of people often have a traditional dance routine that accompanies the singing. By placing emphasis on these four characteristics, one can better determine how to incorporate East African choral music in a more authentic manner. The following Kenyan Counting Song titled *Moja Mbili Tatu Nne* demonstrates how the pedagogy of performance can be achieved to meet the standard of analyzing the structure and context of varied musical works and their implications for performance. Figure 4 shows the musical piece selected (Kenyan Counting Song). Students should focus on the acquisition of a foreign language (Swahili) as well as the intonations, rhythms and the melody to understand the culture prior to the performance.

MOJA MBILI TATU NNE

Swahili counting song from Kenya

Optional acc. djembes, log drum, cabasa, bongos, tambourine, cymbals

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$\text{♩} = 120$ *f* (piano on repeat)

Mo - ja mbi - li ta - tu n - ne ta - no si - ta sa - ba na - ne ti - sa ha -
 One - two - three - four - five - six - se - ven eight - nine - news

4
 ba - ri ya Ja - nua - ri, Mo - ja mbi - li ta - tu n - ne ta - no si - ta sa - ba na - ne ti - sa ha -
 of Ja - nua - ry

8 *mf* (piano on repeat)
 ba - ri ya Ja nua - ri Ku na m - tu mmo - ja a - li - ye po te - a na tu - ki - m pa - ta tu - tam - le - ta ha - pa

13
 Ku - na m - tu mmo - ja a - li - ye - po - te - a na tu - ki - m - pa - ta tu - tam - le - ta ha - pa

Song may be repeated as many times as the dance moves

Figure 4. Kenyan Counting Song

Pre-performance Pedagogical Options

The teaching of world music to children requires a systematic approach, in order for the children to fully understand the cultural meanings within the music. The teacher helps students pronounce the Swahili words used in the song. The children may stand in a circle and make hand signs while singing and counting. The children may sit in a circle and pass plastic plates or sticks to an adjacent child in the rhythm of the song. The teacher may divide children into three groups: 1st group to play African instruments; 2nd group to sing; and 3rd group to dance in circles by creating guided moves of their choice to the rhythm.

Sample Presentation

- Step 1: The teacher sings the melody (main thematic material).
- Step 2: The teacher sings and plays the melody on the piano.
- Step 3: The children sing along with the teacher without the piano.
- Step 4: The teacher sings and plays the melody while children sing along.

**Steps 1 through 4 are repeated several times until a satisfactory mastery of the piece is acquired.*

Conclusion

This paper suggests that all human cultures have music -- hence, music is a universal feature of the human experience. The paper shows that the universality of music is a human artifact which is manifest in young children, who typically have a natural inclination to express themselves through singing, playing instruments, and dancing. Based upon the academic literature cited, the paper also shows that children are surrounded by music throughout their daily lives, including experiences in cultural, social, and technological interaction.

This paper has also provided salient and recent research to support the power of music in the lives of children from all domains of learning, ranging from psychomotor, cognitive, and affective capacities. The paper has shown that music helps develop written language skills in children as well as helps in the enhancement of body awareness, motor skills, and problem solving. The paper has also shown that when children are exposed to music, it promotes emotional well-being and thereby can lead to lowered anxieties, which are essential to learning and improving their quality of life from physiological and psychological parameters. Lastly, the paper shows the direct link between music and other subjects across the curriculum and it can be used as both content and pedagogy.

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