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Music in the Classroom

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In order to maximize children's learning environment, this article describes how classroom teachers may introduce different types of music into the daily classroom schedule; current findings indicate music contributes to students' learning. This discussion identifies several different kinds of music and further describes how classroom teachers and children may benefit from listening to music as background for learning.

Introduction

Music, as a universal language, surrounds us and permeates our lives. So, as educators, is it not reasonable to routinely implement music into the daily dynamic of our classrooms? Typically, the content, instruction, and assessment we provide our students utilize the linguistic and mathematical arenas. Yet music, with respect to listening to, learning about, and practicing, simultaneously engages both brain hemispheres (Reimer, 2004; Sherman, 2011). Howard Gardner posits that individuals represent a range of multiple intelligences (Gardner, 1983; Gardner, 2006). In addition to the traditional references to linguistic and logical-mathematical intelligences, Gardner as well describes bodily-kinesthetic, spatial, interpersonal, intrapersonal, naturalistic, existential, and musical as inherent capacities. Children with musical intelligence are skilled with the ability to appreciate and produce rhythm, timbre, and pitch; as well, they have a great appreciation for the various forms of musical expressiveness (Gardner & Hatch, 1989). Children tend to learn more effectively when there is music in the background, when the teacher speaks rhythmically, and when lessons are turned into lyrics. As educators, by incorporating music into our classrooms, we are creating another possibility for our children to be comfortable and learn.

For this current discussion, music in the general education curriculum is defined as usage in any way to enhance a lesson or usage as background music in the general education classroom. This does not include activities in the music classroom or outside music lessons. The purpose of this discussion is to consider how background music may contribute to children's learning.

Music and Physiology

Sherman (2011) reports listening to music increases blood flow to the brain. When we listen to music, multiple parts of the brain are active at one time. Using MRI machines, researchers discovered that as subjects listened to and processed the music, multiple parts of the brain were activated concurrently,

rather than in one predominant area. This processing of the music and sound was happening simultaneously.

When engaging in musical activities, either as a novice or a professional, both brain hemispheres are activated along with cerebral cortex activity and memory retrieval (Reimer, 2004; Sherman, 2011; Wilkinson, 2013). The physiology of the brain, while having seemingly central locations for certain mental and physical functions, is quite individual and diverse. These individual differences can be demonstrated in many ways. For example, it is probable that different life experiences will cause different developments in the brain (Reimer, 2004).

Whether one likes to admit it or not, music has a physical effect on our bodies as well as our emotions. Many people like to exercise to up-tempo music in order to help drive them forward to complete their workout. In yoga classes, however, one will find the music to be more peaceful and serene. This is because of how we uniquely respond physically or emotionally to the music to which we listen.

Findings demonstrate that music with a faster tempo causes an increase in a participant's blood pressure as well as a rise in the heart and breathing rates. In contrast, listening to slower music evidences a lowering of breathing and heart rates (Trappe, 2012). Baroque music, whose tempo averages around 60 beats per minute (the relaxed pulse of a healthy heart), regulates heart rhythm and blood pressure and lowers cortisol levels (Wilkinson, 2013). Could this be a reason why we drive a bit faster when listening to music with an increased tempo or why, in a spa, in order to relax, we hear music that is soft and with a slower tempo? In other words, music and behavior are related and music choices may not be incidental, but made intentionally to evoke a particular response.

Currently, music is used therapeutically in the treatment of different diseases. Data describe how music therapy contributes to an individual's well-being by lowering anxiety levels, decreasing blood pressures, and diminishing heart rates. Music therapy is also shown to help reduce the risk of future events such as heart attack and death (Trappe, 2012).

Stress is an everyday part of life. We experience stress in our homes, work, and school settings. Even the youngest child can experience stress. It is the ways in which we handle stress that determine possible harm to our bodies. Prolonged periods of stress can cause gastro-intestinal (GI) problems, high blood pressure issues, headaches, sleep disturbances, and fatigue behaviors. Emotionally, because of stress, one could have outbursts of anger, anxiety, and depression. This physiological response includes the release of the stress hormone, cortisol (Yehuda, 2011). Findings indicate listening to music can help lower the amount of cortisol released in stressful situations (Yehuda, 2011). A musical piece in a major (happy) key lowered the levels more than those in a minor (sad) key. This same study showed that techno music actually increases the cortisol level. On the other hand, pleasant music leads to the release of dopamine and serotonin in the brain, both of which are regarded as "good mood" hormones.

Music also affects brain waves. Two types of brain waves are alpha and theta. Alpha waves appear during relaxation and theta waves appear during deep relaxation. Music, of a specific tempo (50-80 beats per minute), can help to stabilize mental, physical, and emotional rhythms and lead students into the alpha brain wave state. The alpha brain wave is a state of relaxation, deep concentration, and focus during which large amounts of information can be more easily processed (Brewer, 1995). Some commercial interests believe that people can focus their attention on a particular rhythmic stimulus long enough as to reach a different level of awareness (Transparent Corporation, 2015).

Music: Feeling and Thinking

Music affects the human body and can influence emotions. If you are feeling gloomy, what music might you listen to in order to uplift your outlook? For me, listening to Motown or Broadway works well to adjust my attitude.

Studies indicate that the use of background music in the classroom lowers teacher's anxiety and increases students' attentiveness (*Can background music help learning?,* 2008). When our stress levels are high, we are unable to concentrate and make intelligent and informed choices. Music helps to reduce stress by lowering cortisol levels, the hormone released in stressful situations (Yehuda, 2011).

Music also has the power to move us to action. The Civil Rights movement inspired songs like "We Shall Overcome" and "We Shall Not Be Moved." Similarly, during the Revolutionary and Vietnam Wars, people used music to rally around and articulate anti-war sentiments ("Yankee Doodle" by Dr. Richard Shuckburgh; "Ballad of the Green Berets" by Robin Moore and Staff Sgt. Barry Sadler; and "America" by Samuel Francis Smith).

When you hear a song from your childhood or youth, the music takes you back to another place in time. Does a particular song motivate you to smile? In contrast to happy feelings, does hearing some music/song cause you to remember a sad event? Listening to music allows us to revisit experiences and feelings many years in the past. How is this memory recall possible? Alzheimer's patients can recall memories from years past when an old familiar song is heard. This is because music uses both hemispheres of the brain. Music creates brain activity many other methods, like conversation, cannot achieve (Sherman, 2011).

Music and Content

When considering an ethnicity or culture, music is always one of the topics discussed. Music and the arts is an important part of cultures across the world. For example, Polka music is an inherent part of German culture, as is lederhosen and Oktoberfest. Mexico is known for their mariachi bands, Ireland for Celtic music, and the pentatonic, or five-note, scale gives Eastern music a distinct sound. In addition to New Orleans as the birthplace of jazz, the United States is also home to gospel and rock and roll. Music provides a window into the history, culture, and ethnicity of a country. Music provides a window into the history, culture, and ethnicity of a people.

Our goal, as educators, is to enable our students to become critical, reflective, and informed citizens. To this purpose, we teach critical thinking in science, math, literature, and the arts. As we introduce our students to the cultures of the world, we support their understanding of how to relate to these differences. As Mr. Glenn Holland says, "I guess you can cut the arts as much as you want, Gene. Sooner or later, these kids aren't going to have anything to read or write about." (Mr. Holland's Opus, 1995). In other words, it is the arts that make us human and unique and music is integral to our human capacity.

Music and Schools

Regarding using music in schools, a local teacher uses isochronal music in his classroom on a consistent basis (F. Smith, personal communication, September 2016). Isochronal tones are singular tones being turned on and off rapidly which are then overlaid onto a music track. Isochronal tones can be played through speakers. Binaural auditory beats must have two tones in each ear and require the use of headphones. Websites tout that isochronal music can help increase cognition and focus and can increase emotional stability and motivation or energy (Transparent Corporation, 2015). If this were true, then listening to music with isochronal or binaural beats would prove to be an effective study aid. Other than

websites promoting material for purchase, minimal research can be found to prove the validity of using isochronal music as a study aid. However, this particular teacher finds that his students are more focused and remain calmer on the days it is playing. He also finds that he, as the teacher, is more focused while listening to this type of music (F. Smith, personal communication, September 2016).

Kennel, Taylor, Lyon, & Bourguignon (2010) conducted research on 20 participants with ADHD ranging in age from eight-21 to see if binaural auditory beats (BABs) would increase their attentiveness. Students were given various tests, some while listening to music with BABs while the control group was provided with a similar audio CD that did not contain BABs. There was minimal evidence to prove that BABs have any effect on students' attentiveness. However, parents and adolescents in both groups noted less inattentiveness in homework assignments during the study and requested a CD for personal use. Despite the lack of significant findings, it appears listening to the soothing background music was perceived as a positive experience.

"There exists a serious lack of understanding, in education, of the importance of music in neurological and emotional development and learning" (Wilkinson, 2013, p. 29). This lack of understanding, in most instances, is the reason why funding for music and the arts, in general, is the first to experience diminished budgeted resources. With an improved understanding of the relationship between music and thinking and feeling, educators may more effectively meet the needs of many more of their students.

Wilkinson (2013) describes how in one scenario, music was played to 'at-risk' students during an art class. Previously, these students held their emotions inside and were reluctant to express their feelings artistically, let alone verbally. While listening to the music during art class, these students appeared more able to freely express their feelings through their artwork. The music seemed to allow a gentle release of tension in a non-aggressive way (Wilkinson, 2013).

Whether to release tension or to improve moods, people generally listen to music for its emotional effect. A song from years long past can remind the listener of teenage heartbreak or quiet joy. Songs with moving lyrics or moving music itself can bring the listener to tears. A commonly held view is that music acquires its emotional meaning from association with consequential events (Krumhansl, 2002). Often, a listener will connect musical pieces with a specific moment in his or her life. A person's emotional response to music can be said to be a function of both the music and the individual (Daly et al, 2015).

Due to differing individual responses to external stimuli under the same conditions, emotions are highly subjective (Bhatti, Majid, Anwar, & Khan, 2016). The human range of emotions is generated from a basic set of emotions which is not a set standard; brain scientists and psychology experts propose different models which include happy, sad, joy, anger, and fear. Because of the subjective quality of our emotions, it is impossible to truly know how a student will react or be affected by the music an educator chooses to use in his or her classroom. However, through music, the aesthetic exposure we present to our students may have the potential to develop within them a sense of emotional and empathic well-being.

Just as music effects our bodies' physiological responses and our emotions, music can also have an effect on our students' learning. Music simultaneously stimulates both the left and the right sides of the brain (Wilkinson, 2013). Additionally, music also stimulates the limbic system, which is responsible for long-term memory. Findings demonstrate how students learned three-to-five times faster than normal when background music was played while learning new material (Wilkinson, 2013).

Studies describe the effects of playing "background" music in the classroom (*Can background music help learning?*, 2008; Savan, 1999*).* Background music is music that is heard but not actively registered by the brain. Music which captures the listener's attention is no longer functioning as background music

(Savan, 1999). Background music helps to lower teacher anxiety, raise student involvement, and student productivity (*Can background music help learning?*, 2008).

In a study done at Moseley Secondary School in Birmingham (UK), two different science classes with the same teacher were observed both with and without playing background music during the lesson. Dr. Penny Upton, a psychologist, observed the students and the teacher. She described how, before the background music was playing, students were fidgeting and the girls were more focused than the boys, who were just chatting. Once the music began to play, she noticed that the fidgeting ceased and the boys began to focus on their work. She also discussed how there was less anxiety and stress on the part of the teacher (*Can background music help learning?*, 2008).

One element shared by many studies is the importance of the volume and genre of music chosen to be background (Cantor, 2013; Dolegui, 2013; Hallam, Price, & Katsarou, 2002). As the brain processes, cognitive function is impaired when the brain is trying to focus on the lyrics of a song as well as understand new material. Students are less able to focus on their work if the music is familiar or contains lyrics. Findings indicate it is calming, relaxing music that has a benefit on cognitive function (Hallam et al., 2002). Hallam et al. (2002) found the calming and relaxing music helped students to complete more mathematics problems as well as remember more missing words from sentences. Participating students interviewed in the study at Moseley described the music as soothing and relaxing the mind. In addition to background music helping with concentration, students also identified motivation as a benefit (*Can background music help learning?*, 2008).

The entire brain is involved when listening to or making music (Sherman, 2011). Passive listening does not make one smarter, but it does help to increase attentiveness.

Just as important, if not more, as the genre, or style, of music is the volume of the music being played. True background music is played at a volume so as to not require the teacher to raise his voice when speaking with the students. Louder music distracts students from their work. It has a negative effect on their memory and leads to a lower level of pro-social behavior (Hallam et al., 2002).

Savan (1999) describes how ten 11-12-year-old boys with Emotional-Behavioral Disorder (EBD) saw an improvement not only in their work and attention span, but also in their behavior when background music was introduced. The students were played selections of Mozart's orchestral music during five 40-minute science classes. Data recorded drops in blood pressures and decreases in heart rates and body temperatures as well as noting improvements in behavior and attentiveness. These physiological improvements caused an increase in co-ordination which may in turn have helped to decrease the students' frustration levels and allowed them more self-control.

Music is demonstrated to be a useful learning tool, not only as background music, but as an active instructional alternative (Lum, 2008). Lum (2008) interviewed Singaporean mother-tongue teachers about their use of music in their classrooms. One of the teachers is an avid musician and strives to share her love of music with her students and often plays background music of her choosing while her students do seatwork. Another of the teachers interviewed uses songs in her lessons to help teach vocabulary words. She noticed that her students paid more attention and were more interested in a lesson when she introduced a song.

Teaching students songs that go along with a lesson is an effective way to incorporate music into the general education classroom. For example, during her unit on plant and animal cells, an area teacher introduces her students to the "Cell Rap." Her former students of years past can still sing this rap that

helps them to remember the make-up of both plant and animal cells (B. Tuverson, personal communication, October 2016). Music reinforces memory.

One of the most important reasons to include music in the classroom is that "using music for learning makes the process much more fun and interesting!" (Brewer, 1995, p.1). Brewer provides several benefits to using music in the classroom which include facilitating a multisensory experience, establishing a positive learning state, creating a desired atmosphere, and energizing learning activities.

The musical influences of the mother-tongue teachers in the Lum (2008) study played a major role in their use of music in their classrooms. Devi shares her love of music with her students and encourages her students with musical backgrounds to perform at school assemblies to share the Indian culture they study with other students. The musical influences of teachers will naturally transfer into their classrooms. Music is a part of who we are as human beings. Allowing these influences to enter the classroom, will allow our students to know more about us and relate to us as people and not merely "the teacher." As children share their favorite music with one another and the teacher uses music in lessons and as instructional background, music can play an integral role in relationship building in the classroom community (Wolpert-Gawron, 2014).

A teacher can use music in many ways and for different reasons in his or her classroom. It can be used as an aid to teach vocabulary (Lum, 2008; Wolpert-Gawron, 2014; Brewer, 1995), to supplement history lessons (Antepenko, 2008), and to serve as writing prompts (Antepenko, 2008; Brewer, 1995; Wolpert-Gawron, 2014).

Conclusion

As contemporary educators, we daily interact with a range of students' cultural, ethnic, language, and ability differences. Admittedly, there is no "single learning alternative" that is effective for all children. Yet, it appears that music may offer the classroom teacher with a least expensive, least intrusive, and most inclusionary tool to assist in their learning. Using music as background for learning is nonthreatening and suggests a potential for establishing a "safe and comfortable" context for all children to learn. So, give music a try in your classroom and don't forget to ask your students how they are feeling and thinking about the music.

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