THE BENEFITS OF MUSIC CLASSES FOR PRESCHOOLERS: THE ABC OF DO RE MI

by Joanne Ruksenas

Music Teacher. PhD Candidate, Queensland Conservatorium of Music, Griffith University, Brisbane, Australia

Introduction

It appears that the Mozart Effect may have finally been laid to rest. In 2010, a comprehensive review of the 40 or so papers published since the initial paper by Rauscher et al (Rauscher, Shaw, & Ky, 1993) has concluded there is little evidence for the effect and that this effect is similar for many different types of music (Pietschnig, Voracek, & Formann, 2010). This is great news for music educators. There is a great need to define music research in terms of the unique contribution music makes, rather than how music helps other subjects. We need to research and discuss the benefits of music education in terms of how music education stands alone: the benefits of learning music brings that nothing else provides (Woods, 1991). Continuing to discuss music education in terms of how it helps mathematics, literacy, and other subjects diminishes the contribution studying music makes as a subject in its own right and places music education in a very precarious position (Hetland & Winner, 2004).

While we continue to define the benefits of music education wholly in terms of how the study of music benefits other subjects, and students continue to perform badly at these subjects – and the report on NAPLAN testing suggest that Queensland’s students are among the lowest scoring in the country, where does this leave music? (Australian Curriculum, 2010). In a very precarious position (Woods, 1991). Consider this, even if our students were to rise to the top of Australia’s ranks, the contribution made from studying music would most likely not be examined or given its due credit. There is a real need to identify the strengths of music education that are unique to music education to justify the inclusion of music in the curriculum.

The style of music education that I refer to in this essay is a structured, experiential program, preferably singing based, such as the Kodály based program (Forrai, 1985). As the Mozart Effect has illustrated, just listening to music does not have any significant benefit. Children need to experience music to achieve the full benefit. Classes, such as those in a Kodály program combine multiple sensory skills – the children sing, play games, clap, move, and dance. The children learn under the guise of having fun. There is a wealth of research in cognitive psychology and neurosciences that point to these type of activities making a dramatic difference in cognitive development and success in education.

There are many unique reasons that justify the inclusion of music in an educational program in its own right. Due to the limited scope of this paper I have chosen the three which I feel are the most relevant.

Two widely recognised sources of neurogenesis are being happy and movement – a well-designed music class incorporates both

In 2000, the invention of new cell markers enabled neuroscientists to identify neurogenesis in the human brain. This contradicted a long held belief that humans are born with their full complement of neurons and once these die, they are not
replaced. The common denominator appears to be the presence of serotonin – a neurotransmitter released when we are happy (Gage, 2001). In turn, the serotonin agonist neurotransmitter, acetylcholine, is produced when we are stressed, inhibits neurogenesis (Motluk, 2000). It appears humans are capable of growing new nerve cells throughout life, making our brains plastic and responsive to our environment. Figure 1 shows the proliferation pathways discovered by Gage and his colleagues. These pathways are associated with memory formation and the transmission from short term to long term memory.

![Figure 1: The migration pathways and fate of neural stem cells.](image)

There have been a number of papers published that highlight the benefits of exercise on neurogenesis with results indicating that regular periods of exercise enhance serotonin production and neurogenesis (Paizanis, Kelai, Renoir, Hamon, & Lanfumey, 2007; van Praag, 2008). Serotonin also known as a “happiness hormone” is actually a neurotransmitter involved in the neural reward pathways. Neurogenesis was first discovered in late stage terminal cancer patients who had been given selective serotonin uptake inhibitors (SSRI’s), antidepressants, which make serotonin sit in the neuronal cleft longer (Gage, 2001; Gould, et al., 1999). Thus, the rate of neuronal proliferation and survival also depends on our state of mind – whether or not we are happy. An experiential music program, where the children move and sing in
a supported, sharing environment would appear to be an ideal way to achieve these outcomes.

The first six years of life have been identified as the most critical in terms of neural modelling and brain development (Woods, 1991). This makes the introduction of music lessons in an experiential music program in early childhood a potentially mind altering experience, however the benefits of a carefully integrated music program will benefit people at any stage in the course of their lifetime.

**Music lessons are holistic and encourage whole brain thinking and development**

Experiential learning – learning through doing seen in a Kodály based program incorporates the three main learning styles identified by educators: visual, auditory and kinaesthetic (Pashler, McDaniel, Rohrer, & Bjork, 2009). A well structured music program blends and implements these effortlessly. To illustrate this, when learning a new song, the teacher initially models the song and actions, which are continually reinforced and cued until the song is secure, providing aural cues, which are mapped onto the temporal lobe and visual reinforcement, which is mapped onto the occipital lobe. The inclusion and performance of different actions then maps and encodes the memory traces of the song onto different areas of the cortex, including the parietal lobe and cerebellum, areas responsible for motor memory and physical action (Hodges, 2009).

The importance of singing in this process cannot be overstated. The structures associated with singing are located in the right hemisphere for most people and have been found to be analogous homologues for structures in the auditory-speech loop located in the left hemisphere (Deutsch, 2010). Neurologists and music therapists are increasingly using singing to rehabilitate stroke patients and patients with certain aphasias, who are unable to speak because of damage to the left hemisphere structures, and other neurological conditions. Remarkably, although the patients cannot read words, they can sing them (Schlaug, Marchina, & Norton, 2008; Schlaug, Norton, Marchina, Zipse, & Wan, 2010). An overview of the different brain structures and their functions can be seen in figures 2 and 3, which help to give an idea of the number and location of cortical regions being activated during the performance of even simple songs.

![Figure 2: Map of the brain indication principal functions mapped onto the brain regions](Kluger, 2007)
Music balances the brain

Music captures and stimulates our imagination. The human brain has a number of major regions which are divided into two hemispheres: left and right, the cerebellum and the central cerebral structures: the basal ganglia associated with memory and the limbic system associated with emotion (Motluk, 2000). The left and right hemispheres are joined by a tract of white matter known as the corpus callosum. Rapid, efficient communication between the hemispheres is essential. The development of the corpus callosum has been associated directly with development of a person’s ability to understand and process complex information and events (Halford, Wilson, & Phillips, 1998).

The split brain studies of Gage, Gazzaniga, Sperry and their colleagues, where the Corpus Callosum – the tract of white matter that joins the left and right hemispheres is severed, have given further insight into the independent roles and function of the hemispheres (Dronkers, Pinker, & Damasio, 2000; Gazzaniga, 1998; Sperry, 1973). These experiments have indicated that, for most people, the processing of music is localised in the right hemisphere, while the processing of spoken language, reading, logic and maths are localised in the left hemisphere. An education that focuses on literacy and numeracy, the way our education system appears to be heading, is almost completely biased toward the left hemisphere (Woods, 1991). Music has the important role of balancing the hemispheres. This highlights the role of experiential learning through games, singing, play and imagination in music, because
these are the currency of the right hemisphere, much as logic and organisation is the currency of the left hemisphere. Bogen and Bogen claimed that the development of analytic thought processes contributes to a lack of creativity due to a lack of appositional development – the development of analytic thought processes without concomitant development of important nonverbal activities and abilities, hinders the development of the whole person (Bogen & Bogen, 1999).

**Discussion of a single lesson segment**

A typical early childhood music class designed using Kodály methodology comprises 10-12 short learning segments centred on a common learning objective. Every element is designed to be age appropriate and engaging. Examining any single segment reveals a number of activities that are beneficial to neural and social-emotional development.

Consider the game ‘Doggie Doggie’ (Forrai, 1985). This simple circle game uses the tone set $m, s, l$. One child, the ‘doggie’ sits in the middle of a circle formed by his/her classmates. The group sings together, and two children – the dog and the bone thief – each sing a four beat solo. There are the obvious musical objectives of beautiful singing and keeping the beat. There are behavioural objectives, turn taking, cooperation, participation, and learning to follow rules. Sitting alongside these are the socio-emotional benefits. In singing a four beat solo a child has the opportunity
for immediate feedback from their teacher. Because each activity is carefully scaffolded, the children will perform this successfully. The child receives immediate feedback from the teacher affirming this. They experience success and are seen by their peers as an effective class member, which is affirming and is an important step in socialisation and acceptance by self and peers (Paley, 1992; Martin E. P. Seligman, 1990; Martin E. P. Seligman, 1995).

When learning occurs in the stress-free context of a game, the probability other students willingly participate increases. Students will also be more receptive to new learning. These benefits are amplified and reinforced across the 10-12 segments contained within each lesson. The literature indicates that this type of environment is optimal for promoting neurogenesis (Glasper, Schoenfeld, & Gould, 2012; Gould et al., 1999). This is not to say that music lessons are a quick fix, because what occurs will be affected by factors within each child and outside the music lesson. However, this carefully structured lesson model provides a powerful and effective learning tool across many levels.

**Conclusion**

Oliver Sacks claimed that our auditory and nervous systems are tuned for music, perhaps we are as much a musical species as a linguistic one (Sacks, 2006). Recent research into the role of music has indicated that music and singing may have preceded speech and that music and language are partners in the brain (Deutsch, 2010). However, creativity is very difficult to explain and define, which makes music difficult to quantify and difficult to justify teaching when it is discussed in these terms.

Preschool aged children are noisy creatures, they love to move, they love to make funny sounds, they love to sing, and they are uninhibited and naturally creative. Children also have enormous potential – their bodies and brains are designed to have the capacity for an immense array of physical and intellectual skills. As they enter the school system, children learn very quickly that there is a ‘right’ way to do things and there is a ‘wrong’ way to do things, and there is a ‘right’ and ‘wrong’ way to behave – being noisy, spontaneous and experimenting falls squarely in the ‘wrong’ box (Woods, 1991).

Music helps to balance this – there is always more than one ‘right’ answer in a music lesson, and experimentation and improvisation are integral parts of the experience. Piaget said that the principal goal of education is to create men who are
capable of doing new things, not simply repeating what other generations have done – men who are creative, inventive and discoverers. We need to be forming minds that are critical – that do not just accept everything they are offered, that have balanced questioning reasoning abilities that are able to think, reason and imagine beyond what we currently know (Inhalder & Piaget, 1958). It difficult to imagine these qualities developing in a schooling system while it maintains a purely left brained focus. Young minds need the activities and structure that a well-designed music program provides to nurture their development.

The study of music, such as the experience provided in Kodály based music lessons is essential to the development of other skills – not because it has a fifteen second effect on spatial reasoning skills claimed by the ‘Mozart Effect’, but because music makes a unique and substantial contribution to neural development. Music provides an essential balance between the left and right hemispheres, it encourages neurogenesis and neuroplasticity, and helps to develop individuals as whole, discerning entities by encouraging social and emotional growth. Our education system simply cannot thrive without the music’s unique and extraordinary contribution to our intellect and development.

References


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