



THE CULTIVATION OF MUSICAL INTELLIGENCE AND ITS CONTRIBUTION TO CHILD'S DEVELOPMENT - A DIGITAL MUSIC LESSON IN KINDERGARDEN WITH PARENTS' INPUT

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Abstract:

Formal music education influences various aspects of cognitive development such as perception, memory and language skills. There are elements that suggest that music contributes to people's mental health by having a positive impact on pregnancy and adulthood while additionally creating higher brain function in those who are familiar with music in general. This paper will refer to inquiries about the contribution of music and a digital music lesson will be presented that was held in a kindergarten classroom with the participation of parents highlighting ICT's contribution.

Keywords: music intelligence, digital lesson, kindergarten, parents' contribution

1. Introduction

The benefits of music are often questioned, although there is evidence to suggest that music contributes to mental health by positively affecting pregnancy and adulthood and generating higher brain function in those familiar with music in general (Mawby, 2014). This paper will explore the influence of music on the development of children at social and psychological levels during infancy and preschool, the link between music and neuroscience, and the impact of music teaching on children's brain development.

This paper will explore the influence of music on the children's development at social and psychological levels during infancy and preschool, the link between music and neuroscience, and the impact of music teaching based on Gardner's theory in musical intelligence on children.

Finally, reference will be made to the use of technology in music teaching and a presentation of a digital music lesson will be briefly presented that was implemented in

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a kindergarten classroom in a playful way involving parents, teachers, but mainly students.

2. Music and children's development

"The relationship of music to the child and education can be described as follows: the child can "play and invent" through music, discovering the world and himself. He can express and communicate, share his experiences and participate in the experiences of others, developing through his artistic creation his psycho-emotional world. He may ask questions about himself and others that will help him to mature through the experience of creation" (Tsiridis, 2003: 23)

Musical activity involves various types of social skills, such as the skills involved in interacting with other team members and emotion regulation skills. Research results have indicated that music can encourage social and cultural elements of human behavior, even at a very early age.

Gerry, Unrau, and Trainor (2012), observed social communication between 6-month-old children exposed to two types of music education- one with active participation and the other with passive exposure to music. Toddlers who received active music education found a faster improvement in interpersonal skills compared to passive exposure infants. Also, music teaching could have beneficial effects on psychological factors such as self-esteem.

Feeling is an important component of music. Musical expressiveness involves the representation of a particular emotional tone transmitted through sound. The role of emotions is also evident in acoustic tasks, in which the role of emotions expressed through specific sound patterns must be recognized.

Logenswaran and Bhattacharya (2009) analyzed whether the transfer of recognition emotions appeared in emotional recognition from the music sector to the optician, examining behavioral and electrophysiological data. According to the results, listening to music that produced negative or positive emotions influenced the recognition of negative or positive emotions presented through visual stimuli.

Similar results were found by Marin, Gingras, and Bhattacharya (2012) who studied the effects that music pre-processing might have on visual stimuli decoding. Music, therefore, as well as its effect, due to its dynamic character (McClellan, 1997) and its components is especially significant on multiple levels (Stamou, 2004). Much research which has been conducted, has shown that teaching music to children of young ages, has positively affected their cognitive abilities (Raucher, Shaw, Levine and Ky, 1994), their social behaviour, their communication with the environment, the development of their visual and perception abilities, as well as results in exercises where performance was higher.

All of the above, demonstrate the significant contribution of music to every aspect of the personality of a child; social, psycho-emotional, cognitive, intellectual and aesthetic

expression. As research on musical prowess and its portraiture has shown, during infancy, children can perform singing, similar to their performance of speech (Papoyšek, 1982). In fact, through research on infants, Papoyšek argued that babies no more than two months old are capable of reproducing the tone, intensity and melodic curve of the songs of their mothers, while four month old babies can also reproduce the rhythmic structure (1982).

Acknowledging that the voice is the first natural musical instrument of the child, it is suggested that during their second to third year of age, children devise improvised songs in a variety of small intervals (second, minor thirds, major thirds and fourths), while by the age of six they are in a position to reproduce, with sufficient accuracy, the melodies which are heard more often in their environment.

Improvisation, emphasis on playing as a basis for learning, as well as musical learning for children, Dewey's (1971) child participation in musical activities through action – learning by doing - and the approach of music in the school environment, whose basis and starting point are the interests and skills of the children, as well as the way they learn and think, are the principles which many musical educators have adopted in their musical-pedagogical approaches (Dalcroze, 1971; Orff, 1978).

3. Music and Neuroscience

Research has shown that educational programs that include singing, rhythm, music playing and music listening, from birth and subsequently during the child's first five years, are beneficial to the child in social, emotional and cognitive development, and in early learning (Trainor, Laurel J. et al. (2003).

According to McClellan, any active involvement with music, whether synthesized, performed or listened to, activates the involvement of both hemispheres of the brain, thus balancing both sides of mental functioning (McClellan, 1997)

As far as neuroscience research is concerned, exposure to music listening and systematic music teaching, if it starts before the age of 7, can cause the human brain to develop more neural pathways that in the event of a neuronal damage related to speech or language, "*the brain will probably be able to secure communication through musical neural pathways*" (Dritsas, 2002).

Indicatively, the Mozart Influence concept states that infants and young children can benefit from exposure to early musical sounds (Chao, et al., 2009). Experts explain that optimal learning in children occurs when the two brain hemispheres work together. Every brain development strategy, such as using music that incorporates the functions of both hemispheres, uses natural brain design to facilitate children's learning.

Technically, when two halves of our brain are working in sync or working together, learning is optimized, thereby allowing children to receive what is most effective (Hallam, 2010).

Another study by Gromko (2005) showed that children receiving music training would develop hearing skills for oral sounds and words faster than children who did not receive music instruction.

Corresponding research by Anvari, Trainor, Woodside, and Levy (2002) supported the claims of a relationship between music training and linguistics development. They examined phonological knowledge, early reading and comprehension skills of music in one hundred children aged four and five years. The children received experiences with a set of musical tasks focused on rhythm, melody and chord evolution. They were then tested for phonological knowledge and reading skills.

Anvari et al (2002) found that music skills were associated with phonological awareness and early reading skills. The basic listening skills for music perception were similar to the early reading skills that some of the same listening mechanisms provided for reading ability. Thus, although this study was not based on an experimental methodology, the authors suggested that competence in musical perception gives children an acoustic consciousness that helps when it comes to reading.

Finally, Franklin, Moore, Yip, Jonides, Rattray, and Moher (2008) found evidence for greater working memory expression in non-musicians. The exploration of the literature on the effects of music on a child's life and development has inspired both research on families wishing to promote and support their children's interest in music as well as on the inspiration and creation of various techniques music related mainly by musicians with the aim of learning and developing children at all levels through it.

4. Gardner's musical intelligence

Gardner, in proposing the theory of multiple intelligence, makes particular reference to musical intelligence as an autonomous intelligence. He argues that early childhood music education is intertwined with child's development theories in particular theories of music development and intelligence, and educators need to understand this form of child development as well.

According to this theory, we can all learn the world through language, rational mathematical analysis, spatial representation, musical thinking, using the body to solve problems, understanding other people, and understanding diversity but also we can learn the ways in which these intelligences are used and combined to perform different tasks, solve various problems and make progress in different areas (Joosse, 2008).

Gardner (1993), in his theory, advocated four major stages for art development of the individual, corresponding in some way to the stages of Piaget's cognitive development, and which we can consider by designing a music lesson.

The four stages of art development are characterized by the behavior of each age and are as follows:

- 1) The stage where the child communicates directly.
- 2) The stage where the child uses symbols.
- 3) The stage where the young person works as a craftsman and

- 4) The stage where the young person acts as a critic and participates fully in the artistic process.

The first two stages are directly related to the first childhood we are referring to. The child communicates directly from birth to the age of two, while using symbols from the age of two to seven. Gardner believes that multiple intelligences can be used as teaching content, as well as a way of impartation, and that the entire society may benefit from an educational approach which recognizes and cultivates different forms of intelligence, not only the children (Chen, 1997a). Therefore, since as individuals we have different types of intelligence, then we should provide opportunities for different choices during the learning processes.

5. ICT in Kindergarten

Teaching, in the school of today, is based mostly in the linguistic and mathematical intelligence, ignoring the other intelligence modals which Gardner discussed in his theory. Gardner led to a re-evaluation of the importance of various knowledge fields with multidimensional nature of cognition, featuring those which relate to artistic activity for the education of children, such as musical intelligence. A school with children and the creation of their intellectual profile at its center, as well as the opportunity to work with their unique skills and inclinations through the entire learning process, are the cornerstone of the theory of Gardner.

The computer, as a means which joins the program of the kindergarten, has much to offer and according to the nursery guide it is *"The tool which has the potential to expand educational opportunities, adding a new dimension to the developing activities and reinforcing the dynamic of the exploratory – creative game"* (DEPPS, 2011).

The Curriculum for ICT in pre-school and primary education, for the purpose of using ICT in kindergarten, states: *"(the children) organically use software and internet services, integrating ICT in their daily kindergarten activities as supervisory teaching means, as exploration, experimentation and problem solving tools and as tools of information management, digital literacy and expression in various ways of creation, communication and cooperation"* (Ministry of Education, Research and Religious Affairs-PI, DEPPS, 2011).

According to the CTCF (Interdisciplinary Unified Informatics Curriculum Framework) *"the objective of Informatics in Nursery and Elementary School is to familiarize students with the basic functions of a computer and make first contact with its different uses as a supervisory means of teaching, as a cognitive exploratory tool and as a tool of communication and information seeking in the context of daily school activities, with the use of the appropriate software and especially open-source inquiry-based learning software."*

6. Material and Methods

Moodle is a free online e-learning platform that offers integrated asynchronous e-learning services. A very important feature of the Moodle system was the creation of an online

music lesson that incorporated material we created with Moodle tools in an original and flexible way.

Initially a dictionary of symphony orchestral music definitions was created to be used for educational games (fig.1), assessment questions and quizzes (fig.2) giving the opportunity to get acquainted with the basic instruments of a symphony orchestra with the combination of animal riddles (fig.3) in <http://e-learning.ilei.sch.gr/moodle/course/view.php?id=7156>



Figure 1: Educational games

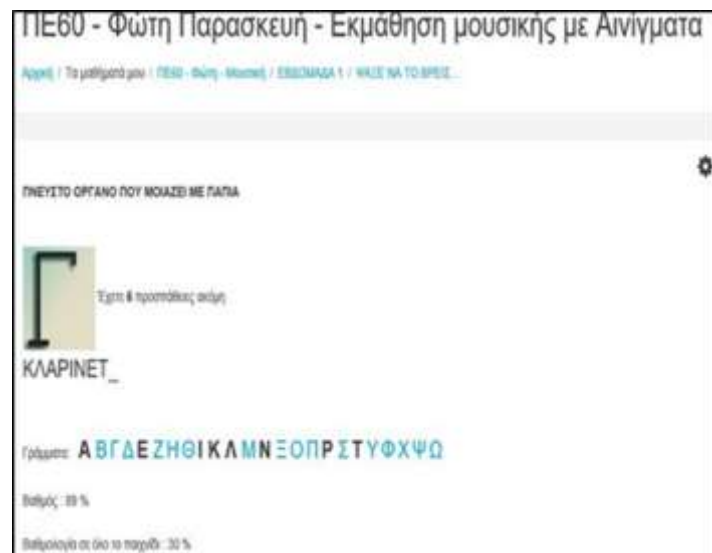


Figure 2: Assessment questions and quizzes

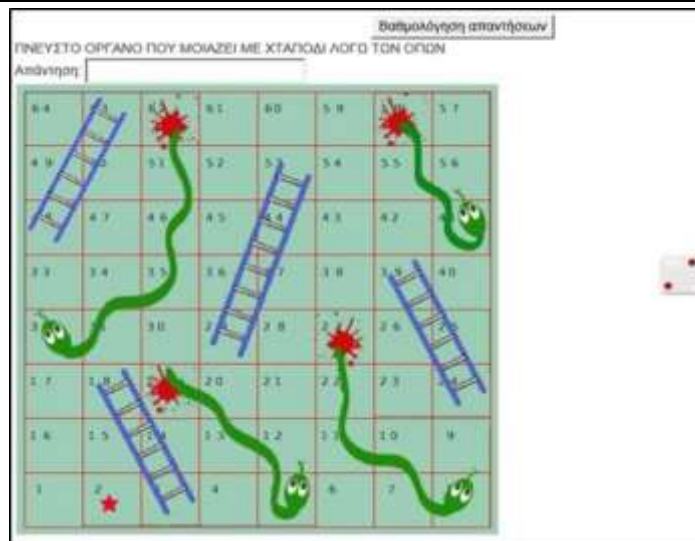


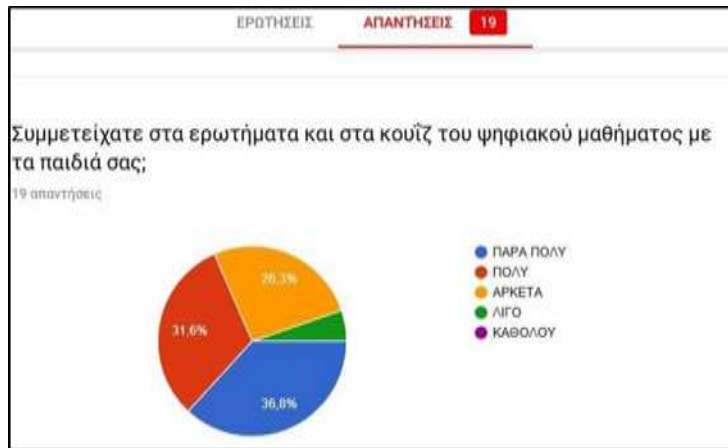
Figure 3: Combination of animal riddles

In conclusion, this digital music lesson was presented in approximately 6 months in a kindergarten classroom of 21 children, 17 infants and 4 preschoolers, who had the opportunity to get to know the symphony orchestra and enrich their music in a playful way that included riddles with animals that resembled musical instruments. Ten educational games based on constructive learning were created and presented to children. The involvement of family was inquired because the main purpose was play with children and play with parents and their children.

7. Results and Discussion

The digital music lesson involved learning the musical instruments of a symphony orchestra in combination with riddles with animals. Children using ICT, and Moodle's open source software, came into contact with the computer not only in the context of school and day-to-day learning but also asynchronously at home with the contribution of their family environment.

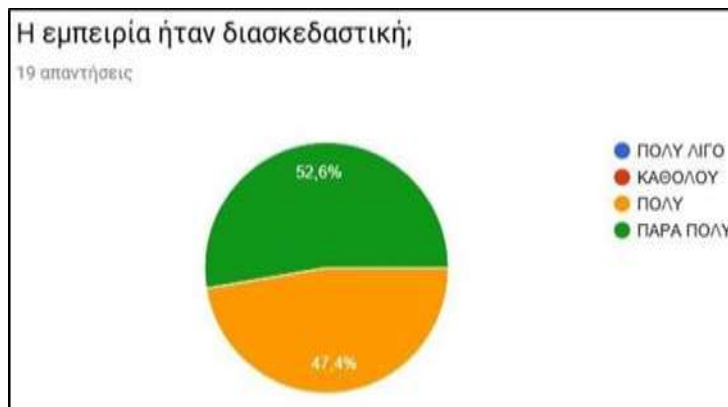
At the end of this six-month digital music lesson, parents completed an electronic questionnaire evaluating the digital lesson and parental participation which provided statistics on parental involvement. Through the analysis of the data collected regarding the digital music lesson and quizzes reached 68% (p.1), children's interest in educational games and the collaboration was in 88% (p.2) the experience was very fun in 57.6 % (p.3), and finally, it is noteworthy that 84.2% (pin 4) of the respondents of answered that they would like to continue such a digital course with the participation of parents and children in other subjects too.



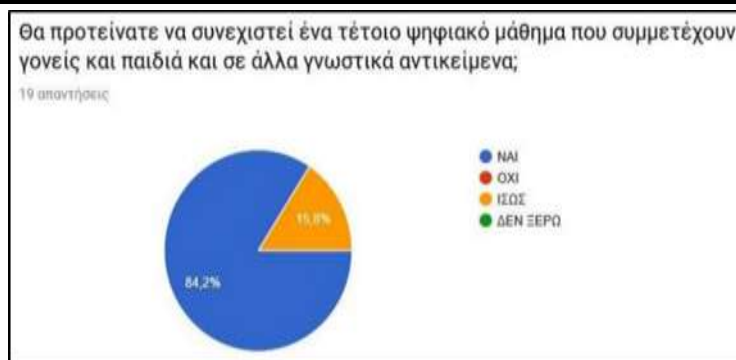
Picture 1: Data collected



Picture 2: Children's interest and collaboration



Picture 3: Funny experience



Picture 4: Continuity of the digital lesson

8. Recommendations

Through this paper, at the beginning music was linked to the development of the child's social and emotional world as well as its connection to the neurosciences, and based on Gardener's theory of musical intelligence, a music lesson was presented that combined digital resources and parent involvement by creating a bridge between school and family.

9. Conclusion

When the arts are intertwined with curriculum areas in the course of teaching and learning, then the motivation for learning is maximized. Such a view of the arts as an integral part of the whole education of the child, in accordance with what has been said above, will result in the comprehensive education of the child resulting in the development of an integrated personality.

Appropriate pedagogical approaches that can be developed for the learning of young children can integrate play with digital media by appropriately shaping the context of the lesson and providing the appropriate tools. and design the room according to the needs and particularities that exist and be able to solve the resulting questions.

The use of ICTs and the creation of a digital music lesson highlights their added value, harmonizes with the daily lives of children and encourages parental involvement by helping children learn, grow and express themselves through fun activities.

About the Author

Paraskevi Foti is a Coordinator of the Primary and Secondary Education at the 3rd Region of Attica (Greek Ministry of Education) and formerly Head of the 4th Kindergarten of Agia Varvara. She has studied piano and higher theory at the National Conservatory of Athens and has completed her master's degree in Intercultural Education and Management of Diversity. She completed her second degree in Psychology at Ethnic Kai Kapodistrian University of Athens with a specialization in Psychology and at the same department she completed her doctoral dissertation with the title: "The contribution of ancient Greek language to art and language of Aesop and the added value of ICT Technology". Her first book, entitled "Otherness, Prejudice and Stereotypes in the School

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