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Connecting Music with Other Arts and School Disciplines in Preschool and Early Primary Education

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Abstract:

Arts are integrated into education either as autonomous subjects or for the teaching of other school disciplines in an interdisciplinary and cross-curricular context. The integration of the arts in education has special value as students are allowed to be engaged aesthetically, emotionally, cognitively, and socially. Activities that connect music with other arts and school disciplines arouse pupils' interest, urge them to become more involved in the learning process, create and produce new products, collaborate with their classmates, socialize, and express themselves. In such a context, preschool and general primary teachers have more alternative and creative ways to organize their lessons through arts inclusion. This paper places emphasis on the integration of music in education through its connection with other arts and school disciplines in an interdisciplinary and cross-curricular context. It proposes connections and presents indicative activities for preschool and early primary education students, aiming at engaging them in aesthetic experiences through the activation of their critical thinking.

Keywords: Music, integration of arts, school disciplines, preschool education, early primary education

1. Introduction

Through the integration of arts in education, students are given the opportunity to express their feelings (Sotiropoulou-Zormpala & Argyriadi, 2015; Eisner, 2002b), meet the concept of 'beautiful,' but also to evolve aesthetically (Lindström, 2012; Sotiropoulou-Zormpala, 2012), cognitively and socially (May & Brenner, 2016). A substantial education that includes the arts can provide a balance in the education of children which is largely focused, at the expense of their aesthetic cultivation, on 'the development of professional knowledge and skills on the basis of intellectual action' (Denac, 2014, 1714).

Music and the other arts are integrated into education either as autonomous subjects or for the teaching of other school disciplines in an interdisciplinary and cross-curricular context. In the latter context, the 'subservient style' is applied, which 'allowed teachers to teach the academic contents with the inclusion of modes other than the verbal and numerical' (Bresler, 1995, 6). Such contexts promote the holistic nature of knowledge (Chrysostomou, 2005), avoiding its fragmentation, thus connecting it to life itself, which constitutes a whole. Music and the arts, in general, can transfer the creative way of thinking to other school disciplines (Bresler, 2002), offering new perspectives to things and situations that otherwise would not be perceived (Lindström, 2012).

The integration of the arts within an interdisciplinary context is also supported (Economidou Stavrou et al., 2011) by Gardner's theory of multiple intelligences (linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, intrapersonal, interpersonal, and naturalistic intelligence) (Gardner, 1993). It is true that, in modern education, special emphasis is placed on the development of linguistic or logical-mathematical intelligence. The aforementioned fact results in students who do not have highly developed intelligence of this kind and feel that they are placed at a disadvantage. The cultivation, therefore, of the several types of intelligence enables teachers to approach their educational goals in a multifaceted way and create an interesting learning atmosphere offering students new possibilities to think and act (Goodnough, 2001).

The integration of arts in education takes on special value when it is required by students 'to use higher order thinking skills and aesthetic qualities to gain further understandings of a particular academic concept' (Robinson, 2011, 289). If this is the case, the teacher has the role of animator and facilitator giving several stimuli to the pupils by activating their interest, as they urge them to think, find the best possible solution to their problem and create their own product. This is what Bresler (1993, 5) calls 'the guided-exploration orientation,' which aims at a more comprehensive child development through the arts.

Regarding music, research has highlighted its contribution to the development of the child in the intellectual, social, and personal fields (Hallam, 2010), increase in IQ (Schellenberg, 2004; 2006), brain development (Collins, 2014), enhancement of creativity (Coulson & Burke, 2013), problem-solving (Burnard & Younker, 2004), its contribution to language development (Moreno et al., 2009; Bultzlaff, 2000), to numerical reasoning and the reinforcement of spatial-temporal skills (Rauscher & Hinton, 2011).

This paper places emphasis on the integration of music in education through its connection with other arts and school disciplines in an interdisciplinary and cross-curricular context. It proposes connections and presents indicative activities for preschool and early primary education students, aiming at engaging them in aesthetic experiences through the activation of their critical thinking.

2. Music and Other Arts

2.1. Music and Drama

During their play, young children are used to improvising, pretending various roles, changing, or lending their voices to their heroes (Young, 2002), creating rhymes, etc., processes that contribute to their socialization and cultivation of their imagination. Elements of drama can be integrated into music lessons. An activity that combines music with drama is the dramatization of a musical work. The musical work can be a song that describes a situation or tells a story, a sound-story, an orchestral piece of music, a musical collage, etc. Dramatization, as a creative activity, should aim at activating students' imagination and creativity. The elements of improvisation, action, and imitation are strongly present in dramatization. Students can imitate the characters and the situations described in the music they listen to using imitative movements. In such activities, where students act without a predetermined script, they approach the process based on their own experience, which helps them understand others more easily, find solutions to problems, and generally develop their creativity (Wee et al., 2013). The purpose of dramatization is not to create a successful theatrical performance. However, the benefits for the child come from the whole process, where the focus is on students improvising and acting. Moreover, the teacher should not be the director but the guide and animator who creates the appropriate atmosphere so that the students can express themselves, always following the established rules.

Other possibilities for integrating elements of drama into music are the musical fairy tale and opera for children. In a musical fairy tale, students can narrate the texts and sing and dramatize the songs by connecting speech, music, and dramatic expression in the form of a musical theater performance. Likewise, opera is a genre that combines many arts and comprises an excellent occasion for art education (Mínguez et al., 2014; Albano de Lima et al., 2011).

2.2. Music and Visual Arts

At first, it seems difficult to find a connection between music and visual arts as music is created in time and uses sound, while the visual arts use space and materials (Chrysostomou, 2005). However, within a cross-curricular context, students can be given a chance to discover how the two arts can be connected.

Some popular activities connecting music with visual arts include capturing a musical work into a painting or matching paintings that represent nature with works of program music, where elements of nature, natural phenomena, etc., are captured in a musical way. In addition, an interesting activity could be how students interpret a work of art while listening to music and how they interpret it without listening to music (Actis-Grosso et al., 2017). Each activity is followed by a discussion about the students' choices and interpretations.

Furthermore, an understanding of musical parameters can be achieved through the connection between visual arts and music. Students can render sound quality (e.g., staccato sounds with sharp lines or shapes, legato sounds with continuous lines, etc.), the performance of tempo (e.g., long lines for a slow tempo, short lines for a fast tempo, etc.), the changes in dynamics (e.g., big shapes for forte, small shapes for piano, etc.), creating thus graphic scores.

Another way music can be creatively connected to visual arts is the creation of listening or musical maps. Listening or musical maps are a way to better comprehend a musical form (Dunbar, 2017; Blair, 2007; Gromko & Russell, 2002). They can be created both by teachers and students through simple shapes or drawings or with the appropriate software. As for listening maps, emphasis is placed on various elements of music, such as rhythm, musical phrases, changes in dynamics, the depiction of the musical instruments involved, changes in the orchestration, etc. After students create the listening map and capture their understanding of the musical work (Ng, 2020), either individually or in groups, they can then present it to the class and share the way they experienced the musical work. Through this double process of creating and presenting musical maps in class, the teacher is given the opportunity to better understand the way the students think musically (Blair, 2006).

2.3. Music and Movement

Responding to music with movement is a spontaneous reaction (Burger et al., 2013). Children from early childhood instinctively react to hearing music with movement (Ferguson, 2005). Responding to music with movement is an active listening activity where students do not passively listen to the music (Young, 1996) but act, which activates their attention, contributes to personal expression, and creates an interesting classroom atmosphere, especially in preschool education (Samsudin et al., 2019).

By using music or various types of rhythmic accompaniment, the understanding and performance of various types of locomotor skills are facilitated (Derri et al., 2001). Movement can also be used as an effective way of musical understanding (Gromko & Russell, 2002; Young, 1996). For example, the high and low pitch can be attributed to an upward or downward movement, tempo changes, slow or faster steps, etc. This happens as music and movement share several common features.

Movement plays a leading role in Dalcroze's and Orff's methods, two of the most important music educational systems. In Dalcroze's approach, the close relationship between music and movement is interpreted through 'eurhythmics' (Anderson, 2011). Via experiential contact with music and the participation of the whole body, a deeper understanding of

basic musical concepts, such as tempo, dynamics, structure, accentuation, and musical expression, is sought (Juntunen, 2002). Also, in the Orff approach, movement plays the primary role in understanding concepts related to rhythm. As the Orff method prompts children to respond with movement to rhythmical patterns (Andrews, 1982), it helps them develop their creativity and discover their hidden potential.

2.4. Activity for Preschool Students That Combines Music with Visual Arts and Movement

The activity can be applied to four and five-year-old students and with adaptations to younger or older ages. The activity aims to understand the different parts of musical composition through its representation:

- In a visual way, through simple shapes or paintings which correspond to the different parts of the musical composition,
- With body percussion and percussion instruments accompaniment,
- With movement

The figure below summarizes an indicative proposal of the activity on the work *Aquarium* by Camille Saint-Saëns.


Musical parts	visual representation	body percussion accompaniment	percussion instruments accompaniment	Movement
A		snapping	bells	First group moves like birds
B		clapping	claves	Second group moves like cats
A		snapping	bells	First group moves like birds
B		clapping	claves	Second group moves like cats
A		snapping	bells	First group moves like birds
C		stamping	triangle	First and second group: the cats chase the birds
CODA		snapping and clapping	bells and claves	First and second group: the birds fly away, and the cats hide

Figure 1: Listening Map and Representation of the Work *Aquarium* by Camille Saint-Saëns, Connection of Music with Visual Arts and Movement

Students work in groups, and each group creates its own suggestions. Then the members of each group, each assuming one of the three roles while simultaneously listening to the music, accompany the musical composition with body percussion, instruments, and movement. The groups discuss and comment on their own performance and that of their classmates, identifying the similarities and differences between the presentations. Through this process, students understand that with the same stimulus, they can create different products, thus realizing that the concept of creativity is multilayered (Economidou Stavrou, 2013).

3. Music and Other School Disciplines

3.1. Music and Language

Both music and language are perceived through hearing (White et al., 2013). The most obvious connection between music and language is singing. Singing by combining music with speech appeals to emotion (Brandt et al., 2012), and through this, it activates attention and concentration (Schön et al., 2008), increases students' interest, and creates a relaxing atmosphere where the mind becomes more receptive (Engh, 2013). Furthermore, due to the combination of language and music, songs can 'optimize the operation of learning mechanisms' (Schön et al., 2008, 976) and can act as a mnemonic mechanism where students can memorize the content of the verses (Engh, 2013; Crowther, 2012). Especially songs can help in the first stages of language learning or in learning a foreign language (Milovanov et al., 2008; Slevc & Miyake, 2006), where it is often necessary to learn individual words, which are part of a whole sentence (Schön et al., 2008).

In addition to songs, sound stories are another creative activity through which music and language are combined. Sound stories combine language through storytelling and music through the rendering of the story with sounds.

Storytelling is considered a creative way of learning a language (Kirsch, 2016). The students can learn new words, remember information, and enjoy telling stories themselves, motivated by the stories that boost their interest (Kirsch, 2016), thus developing their oral speech. So, when a story is accompanied by sound, it becomes even more interesting. Sound stories are a way of getting to know the sounds and familiarizing students with the means of musical expression creatively (creative use of voice, body, percussion instruments, or other sound-generating objects). Texts used in sound stories should be structured in such a way that they contain words, phrases, or meanings, which can also be rendered with sound. Such words or phrases may describe animal voices, nature sounds, characters, pleasant or unpleasant situations, images, etc. Sound stories can be either original, created by the teacher or the children, or a fairy tale can be used as a starting point or texts that raise the students' awareness of social issues, enhancing, thus, their environmental consciousness, the acceptance of otherness, etc. Sound stories, if necessary, can be recorded in various ways, such as with recording software or mobile phone, or any other audio recording device.

3.2. Music and Mathematics

The connection between music and mathematics can be traced back to Greek antiquity. Pythagoreans rendered the musical intervals through the well-known monochord (Creese, 2009), while Plato, in the seventh book of his *Republic* (530 c - 531 c), emphasized the importance of the mathematical sciences (arithmetic, geometry, stereometry, astronomy, harmonics) as a preparatory stage of the education of the future philosopher-rulers who were going to govern the Ideal State. Harmonics has an important place among them, emphasizing the mathematical side of this science (Barker, 1984).

There are several ways in which music is combined with mathematics in an educational context in order to enable students to understand mathematical concepts taught in primary schools, such as the understanding of repeated patterns through activities that include ostinati in music (Perger et al., 2018) or the visualization of patterns using geometrical shapes created with graphical notation (An & Tillman, 2015). These concepts also include the understanding of musical parameters, such as time through measurement and musical rhythms through ratios (4/4, etc.) (Hamilton et al., 2018; Vaughn, 2000). Furthermore, studies have shown that music develops spatial abilities, which are linked to mathematics (Hetland, 2000; Rauscher et al., 1997). Moreover, the use of counting songs so that the students can learn the numbers is popular (Perger et al., 2018).

In STEAM education, there are proposals that connect Science, Technology, Engineering, the Arts, and Mathematics through didactic scenarios and teaching proposals that highlight the vertical and horizontal connection of these subjects (Andreotti & Frans, 2019). In this interconnection of cognitive objects, the arts as artistic objects are those which offer more creative and innovative ways of acting (Andreotti & Frans, 2019), enhance teamwork, and promote communication (Bell & Bell, 2018).

3.3. Music and Physics

The most obvious connections between music and physics are:

- The way that sound is produced,
- The way it is transmitted,
- The factors influencing its transmission, etc. (Turna & Bolat, 2016)

Sound sources can be natural or artificial. Artificial sources include both musical instruments and sounds coming from electronic media such as keyboards, synthesizers, etc. It is important that the sound sources used in the classroom activate the interest of the students and urge them to engage in musical activities through which they can actively participate and express themselves.

Additional sound-related topics can be understood using recording software appropriate for pupils. For example, several free recording software programs allow students to record their experiments with sound, to become familiar with the forms of sound by observing its waveform, and to edit or change the recorded sound, which may come from musical instruments or their voice, through the use of several effects. Students can also get in touch with basic principles related to sound recording and sound quality (clipping, db, etc.) and become familiar with audio file formats (mp3, wav, AIFF, etc.) and music composition.

3.4. Teaching Physics and Language through the Arts– An Activity for Early Primary Education Students

The following activities combine music, drama, visual arts, and movement with physics and language, aiming to create connections between different school subjects and transfer 'of learning from one domain to another' (Alter, 2009, 8). The activities can be applied to first and second-grade primary education students and are completed in two phases. The activities could be carried out through the collaboration of the music specialist and the generalist teacher. Students work in groups. The first phase aims to make students acquainted with natural sound sources via their rendering with all means of musical expression, i.e., percussion instruments, voice, and body. In the second phase, the aim is to develop oral and written speech, to activate the imagination and the ability to find a solution to a problem through story writing activities. Moreover, additional goals are rendering the story with sounds, thus creating a sound story, its performance in the classroom, its dramatization, and the visual representation of the invented story through painting.

- *Phase 1:* The teacher presents the following natural sounds or others that they wish, encouraging pupils to suggest ways of performing them with percussion instruments, their voice, and their body. The figure below shows a version of the activity in detail (Figure 2):

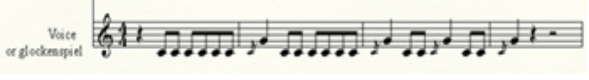
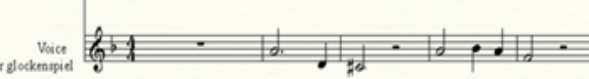
Natural sound source	Use of percussion instruments or voice to represent the sound	Rendering of sound with movement
Sea	glissando on the metallophone	rendering of the undulation of the sea with our body
Hens' voice (cackle)	Rendition of cackle with the voice or with singing part of the theme of Camille Saint-Saëns <i>Cock and Hens</i> .  Alternatively, the students play the notes on the metallophone	Pupils act out as hens moving to the melody
Cat's voice (meow)	Rendition of meow with the voice or with singing the first phrase from G. A. Rossini's <i>Duetto buffo di due gatti</i> .  Alternatively, the pupils play the notes on the metallophone	Pupils act out as cats moving to the melody
Rain	The pupils represent the rain by striking the claves	Pupils act out the rain by moving their palms in a downward circular position and running around the room

Figure 2: Representation of Natural Sounds with the Voice, Movement, and Musical Percussion Instruments

- **Phase 2:** The students are asked to continue the following story. They render the story with the sounds chosen in the previous phase and with new ones, creating a sound story. The class can be divided into groups, and one or more pupils will take on the role of narrator. The story could start as follows:

Once upon a time, in a place by the sea (*the sound of the sea is heard with a glissando on the metallophone*), only hens inhabited (*pupils imitate the sound of cackling and act out as hens*). The whole island was theirs until one day, while it was raining heavily (*the sound of claves is heard, and the students act out the rain by moving around the room*), a ship arrived, and fifty cats came out of it (*pupils imitate the sound of meowing and act out as cats*). After this event, the following strange thing happens on the island.

- **Phase 3:** Students dramatize the story by acting it out with imitative movements.
- **Phase 4:** Students create a group painting based on the invented story.

In activities of this type, the teacher gives pupils guidelines and animates them during the process of creating their own product. Students receiving the stimulus activate their imagination, cooperate with the group, concentrate on what they have to do, look for the best possible solution to the given problem in order to create a satisfactory product, and experience the joy of creation, but primarily participate in quality aesthetic experiences that build cognitive skills as well.

4. Discussion

The activities that connect music with other arts and school disciplines in education should aim, beyond the entertaining role of music, to obtain benefits from the participation of students in quality aesthetic experiences (Sotiropoulou-Zormpala, 2020) through the activation of their critical thinking (Heid, 2005). More specifically, the aim is for pupils to find meaning in what they do via their participation in new experiences where they are involved cognitively and emotionally (Bresler, 2002) in a pleasant learning environment that provides 'positive learning experiences which are rewarding' (Hallam, 2010, 282). Activities that connect music with other arts and school disciplines arouse pupils' interest, urge them to become more involved in the learning process, create and produce new products, collaborate with their classmates, socialize, and express themselves. In an interdisciplinary and cross-curricular context, music should maintain its autonomy without underestimating the role and value of any other school discipline. In such a context, preschool and general primary teachers have more alternative and creative ways to organize their lessons through arts inclusion.

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