Musical Education and the Development of Creativity in the Interdisciplinary Context

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ABSTRACT
Creativity is considered to be a complex personality trait, a general human feature, found in a latent form in all individuals in different quantities. Each individual is creative in his/her way and our (the teacher’s) purpose is to support the pupil throughout the whole educational process, searching for adequate instruments in order to stimulate his/her creativity and define a balanced personality. Forming and developing the creative capacities requires organized and continued actions for stimulation and activation of the creative potential, actions that favor the forming of the pupil’s sensibility and the development of the anticipatory capacity and divergent thinking. In this way, the teacher must assure an educational context which favors the active and interactive learning, using methods, procedures and techniques of efficient learning, having the purpose of developing the pupils’ creative thinking.

The current paper presents a psychopedagogical experiment which showcases the modalities of stimulating and developing creativity in an interdisciplinary context, thus contributing to an increased motivation for learning, and also intensifying the relations related to communication and acceptance between all the pupils through common valorization.

Keywords
Creativity, musical education, psychopedagogical experiment, interdisciplinarity

INTRODUCTION
Since ancient times, the human was fascinated by the process of creation. This phenomenon was analyzed by specialists from different fields of science, being a particularly complex one. In the pedagogical field, the term “creativity” is defined as an intellectual capacity of elaborating ideas, theories, original patterns, starting from pre-existing data (Bontaş, 1994).
The concept of creativity can be applied to a child who learns to play, as well as to an inventor or artist. It can be stated that art represents the most powerful expression of creativity, an extension to human experiences and a representative of the personal vision of the artist, offering a communication channel between him and the public. Music, the most popular and known art is also one of the most profound and subtle forms of human expressiveness.

Starting from the premise that each child is unique and special in his/her way, we propose to analyze creativity manifested in the “Musical education” subject, but also in that subject having relation (or referring) to other fields. In his phase of development, the pupil must cultivate his/her sensibility, imagination, creativity fulfilling the purpose of adapting to reality and performing tasks through intellectual, artistic, spiritual activities, done inside and outside the music classes (Munteanu, 1994).

As research in the field of psychology presents, music has a positive influence on academic performance of the students (Cabanac et al., 2013), and that is why our purpose was to change the perception of the pupils regarding the difficulty of this subject, especially at the theoretical level but also at a practically-applicable one. So, we had in mind to challenge the pupils, through diverse educational contexts, in order to think freely, critically, analytically, and having them put in a situation that requires the maximum creativity thus stimulating their courage of expressing themselves at a musical level.

**Ways of stimulating musical creativity**

*The listening to musical excerpts*

Musical education, representing a fundamental component of artistic education, aims at developing multiple links implicating affective, intellectual and psychomotor functions. It is responsible for creating motivation and attitude towards knowing the artistic beauty, for developing sensibility and for cultivating good formation in music. Listening to music represents one of the important means through which musical education is achieved. The child’s capacity to perceive, to listen, to sing notes, is observed since the pre-notation stage, continuing to be developed in later stages. Listening to musical excerpts and singing represent learning sequences situated at the base of an early musical formation.

Through the music they listen to, the pupils can express their feeling, or can describe the sonorous message either through direct communication or through original ways such as drawings, lyrics, essays. Through the possibility of expressing opinions freely, the pupil has the chance to develop his/her imagination, vocabulary,
hearing, listening skills, capacity of expressing emotions, critical thinking and creativity.

**Vocal singing and instrumental playing**

Important elements regarding the development of musical creativity are both the vocal singing and the instrumental playing. It can be considered that the most concrete way of reaching the musical universe is represented by direct musical practice. By practicing vocal or instrumental music, musical memory can be cultivated, musical hearing can be educated, attention is developed, instrumental habits are formed and developed, all these leading towards the attainment of an attachment for music. Both instrumental playing and vocal singing play an essential role regarding the development of creativity because the use of voice as well as musical instruments offers endless possibilities for creation and improvisation in a very special and unique way (Taylor, 2012).

**The Educational music game**

This complex and extremely efficient musical element is both a method and a form of organizing the activity, and brings a lot of benefits in achieving the musical training of children. It implies a scenario of activities which are to be realized with a dedication sprung from the assumption of responsibilities by the participants in the game. Through the game, the teacher has the possibility of being an equal partner of the pupil, and the specific contents have a limited form thus permitting the pupils and the leader of the activity to manifest their creativity, to express moods or feelings generated by the artistic message without fear or emotion (Kokotsaki and Newton, 2015).

It is known that the game represents the essence and reason of being in childhood, and creativity is stimulated from a preschool age, being continued at school through practicing different games specific to the pupils’ age. The game humanizes, realizes the reality’s psychomotor and social-affective knowledge, and has the role of bringing joy and creating a spiritual comfort (Munteanu, 1997).

**Musical education in interdisciplinary context**

Artistic creativity represents a complex process, nowadays studied from interdisciplinary perspectives. The syncretic and transdisciplinary capitalization on knowledge, skills and abilities gathered and formed through musical education, play an important role in the creative, and also cognitive development of the pupils, these forming a creative personality. Through musical education pupils learn to recognise beauty, to be more sensitive, to be a complete human being. Usually music comes in close relation to other branches of culture or fields of science, engaging pupils in many interdisciplinary activities.
Promoting interdisciplinarity throughout the global education system, but also in the Romanian one, is a necessity, implied by frequent changes and cognitive additions from other fields of knowledge. The term “interdisciplinarity” is frequently used in the pedagogical literature and it refers to the collaboration between different learning disciplines, having the purpose of revealing new truths. Interdisciplinarity employs more types of intelligence including the musical one, according to Howard Gardner’s theory of multiple intelligences. The author says that an individual is born with a certain level of development of these intelligences, but one’s life experiences can result in the development of some more than others and consequently stand out more. In Gardner’s belief, intelligences represent the cognitive capacity of the individual which is manifested through abilities, talents, mental skills that each normally-developed person has (Gardner, 2006).

Interdisciplinary activities imply the convergence of more curricular subjects. Music is in close relation to multiple fields, sometimes being indispensable from other arts or branches of science. The score of a conductor can be seen as a complex map which indicates frequency, intensity, volume, melody and harmony, all together in relation to the exact control of time. Also, it is in close relation with mathematics because, from a rhythmical point of view, it is based on subdivisions of time that need to be calculated, interpreted and applied instantly. Music, through vocal singing, efficiently contributes to learning a foreign language, a fact underlined and even proved in numerous studies (Sârb, 2018). Musical notation is an advanced stenography based on symbols which represent ideas. The semantics of music is the most complete and universal known language. It is in a close relation to history and it reflects the context and exact time in which it was created, including cultural and social values. Music expects movements, so it is also bounded to physical education. It requires an exceptional coordination between fingers, palms, hands, lips, cheeks and other muscles. Music is art, a human experience which inspires thinking, reflection and emotion as many other human relations do. Rhythm and sound stimulate inner moods such as joy or sadness. In the training process, pupils can be guided towards interdisciplinary activities, having in mind the fact that music has a syncretic character and can be easily linked to other arts or fields of knowledge (Thompson, 2014).

MATERIALS AND METHODS
Objectives

The main objective in this research is to investigate the increasing level of creativity of a group of pupils resulted from a didactic approach, through tasks that
observe the stimulation of creativity. The derived objectives of the didactic approach which come to complete the main objective are:

- Stimulation of independent thinking and of creative thinking through diverse interactive or interdisciplinary activities performed in the process of the forming pedagogical experiment;
- Forming the capacity of expressing one’s own ideas and solutions;
- Forming capacities such as: constructive critical thinking, finding creative ideas;
- Active and creative implication of children in activities meant to stimulate productive thinking, divergent and lateral thinking, freedom in expressing knowledge;
- Developing the capacity of independent thinking, spontaneity, and imagination;

In order to achieve this applicative approach, pupils were involved in diverse activities, such as rhythmic and melodic creation, rhythmic and melodic games, musical improvisation for encouraging playing in various ways. Through creative interdisciplinary activities, pupils made connections between music and mathematics (through games and musical exercises), music and literature (through listening to musical excerpts that had a creative purpose – composing lyrics, essays inspired by music), music and new technologies (by creating and reworking musical materials in different programs), music and arts (through musical auditions, having the task to draw/paint a musical image).

At the core of the didactic research we used a methodological system comprising the experimental method and the test method, and as a research technique we used the sample/unique group technique, all based on the musical methods Orff and Kodály during the formative approach, aiming at the development of musical creativity, through musical games, rhythmic and melodic improvisations.

**Sample**

The research sample, unic sample (Sas, 2013), trained a group of 22 pupils, ranging from 12 to 13 years of age, from 6th grade, comprising 8 girls and 14 boys. A study was made, for the observable characteristics of the experimental sample, by means of observing the physical and intellectual capacities of the pupils, but also their social behaviour and attitude towards the educational process. The familiar environment they come from is favorable to scholar adaptation in the sense that most of the parents are preoccupied by the evolution of their child. The subjects of this sample developed interest in extra-school activities, involving themselves with enthusiasm in their unfolding. A real communication between the pupils’ parents and teachers really exists. They are interested in assuring the best life conditions for their children and
they also offer support for their children scholar evolution being preoccupied by the activities that are being done and about their results.

RESULTS

The unfolding of the psychopedagogical research

The research was conducted during the school year 2018-2019, comprising three stages:

A. Initial stage, which had an ascertaining character.
B. Intervention stage, with forming value in stimulating creativity and other psychic processes of children.
C. Evaluation stage, which had a comparative character regarding the results obtained after the experimental forming step.

In the application step we started from the assumption that using methods, procedures and techniques to stimulate creativity within musical education lessons will determine an increased level of creativity, considering parameters such as fluidity (rapidity and ease in linking new ideas to ideological wealth), originality (capacity of elaborating ideas, solutions, products out of the ordinary), and flexibility (capacity of adopting new ideas), all these being considered to be main clues of potential creativity (Guilford, 1950, apud Sălăvăstru, 2004).

1. The initial ascertaining stage

In this stage, we apply a test to the pupils for knowledge and ability check, with the purpose of determining the creative level at the start of the experiment. Through the initial evaluation we checked their knowledge related to the musical language and the way which the pupils use sounds and musical durations realizing various interdisciplinary connections, and we have observed their creative capacities of elaboration and presentation of certain tasks.

The first exercise proposed listening to two musical fragments: a minor one (Hungarian dance no. 1 by Johannes Brahms) and a major one (104th Symphony by Joseph Haydn, p.IV, Finale Spiritoso), after which one the pupils were required to describe each example, through four adjectives.

The second exercise required a graphic representation of the melodic route of four musical examples, with the help of lines and dots. This was making the pupils use their knowledge and imagination for drawing the repeated melodic route, either step by step or with jumps. The musical excerpts they listened to were: Igor Stravinsky-Le sacre du printemps, Maurice Ravel-Bolero, Anton Webern-String quartet, Ludwig van Beethoven-Ode of joy-9th symphony.

The third and fourth exercises require musical and mathematic thinking, pupils having the task of transforming the proper time values in musical values, or
associating musical notes with their correspondent steps represented by numbers, letting them the freedom of establishing the tonality in which they will build a musical scale.

Exercise five, involves a task related to melodic creation, and the last exercise, number six, follows the achievement of a connection between different musical terms, such as: the term *tempo* can be found in the middle of a drawn flower, and the petals will include words such as – Allegro, Andante, Moderato, Largo and Presto.

The evaluation of the exercises of the initial test has been made in regard to three indices of creativity and has been noted according to the level of the creative potential, as follow:

- Below 60 points indicates a low level of creativity
- Between 60 and 80 points indicates an average level a creativity
- Between 80 and 100 points indicates a high level of creativity

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<tr>
<th>Indices of creativity</th>
<th>Fluidity</th>
<th>Flexibility</th>
<th>Originality</th>
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2. The formative experimental stage

In this research, we involved pupils in various activities of rhythmical and melodic creation, combining the traditional methods with the interactive ones, employing during the activities, various rhythmical-melodic games, interpreted in alternative ways, encouraging musical improvisation, the creation and processing of musical materials using different computer software, musical connection with mathematics, through various games and exercises. We also focus on the development of the pupils’ creativity through activities that involve listening to musical excerpts and the creative task of composing lyrics, essays inspired by the music or to transpose the musical image through paintings. Several interdisciplinary activities have been realized, encouraging pupils to make connections between music and math, literature, plastic arts and new technology.

**The development of rhythmic creativity**

The rhythmic creative activities introduced in musical education lessons, were based on musical game through which the creative ability of the pupils was followed to realize rhythmical improvisations using body percussion, simple percussion instruments and pseudo-instruments they made themselves. Through the assigned tasks, the pupils have made connections between music and mathematics, associating
the musical symbols with the mathematical ones, the duration of notes with numbers, because the duration of notes implies relations between values.

Due to the importance of the employment of instruments and pseudo-instruments, each pupil has made his/her own functional percussion instrument, after the material possibilities. The majority of the children have made a maracas, utilizing plastic bottles of small dimensions, halfway filled with rice, sugar and other seeds, other materials involved conical glasses, that made various sounds depending on the amount of water in them, upon being hit with a metallic wand. The pupils could experiment with the different sounds through the circular motion of the finger on the edge of the glass. The cymbals have been built by using two metallic caps that could be hit between them, or a single cap could be used when hit with a wooden stick. Other small percussion instruments were used, such as tambourines, bells, maracas, triangle, claves, small drums, xylophone, finger cymbals. All he instruments, joined with body percussion, have contributed to helping the pupils present short rhythmical improvisations (Niedermaier, 1999).

One of the games of musical rhythmical creation involved pupils using the instruments accompanied by body percussion. The game consists in the repetition of a rhythmical motive improvised by the teacher in front of the class, and then, one by one, each student will replace the teacher and will continue the game with the previous pattern, going in chain. The game helps develop the rhythmic and metric sense, the ability to improvise, and it helps fixing the knowledge attained about measures and durations, it develops the fellowship spirit among pupils through the fact that each pupil is supposed to repeat so many times the rhythmic motive improvised until the execution is correct.

Another game proposed deals with the ability of the pupils to execute rhythmical fragments in groups, following a good synchronization. Each pupil will receive an instrument. The class will be divided into four groups, and the members of each group will collaborate to compose a rhythmical fragment containing four measures, in 2, 3, or 4 beats, destined to be executed by the following group of pupils. The material realized by the first group is to be executed by group number 2, and the pattern is followed by groups 3 and 4, the latter executing the material of the first group. The four exercises created by the pupils will be noted on the blackboard, to be performed by the group involved but also to verify the level of precision by the public (comprised out of the other groups). This game demands rhythmic creativity from each group, develops a team work capacity and synchronized rhythmical ability.

Other activities that draw base from rhythmical exercises have been realized, that capture the link between music and mathematics, through the association of durations with numbers, having the role of expanding the creative thinking and the
logical-mathematical one. As such, children have completed four measures that had missing beats or have developed rows each containing four measures framed in the metrics learned (2, 3 or 4 beats), combining pauses and durations. Afterwards, every measure was individually read rhythmically (in pairs, in the case of rhythmical compositions) or by the whole class (the elliptic measures being completed by a student at the blackboard).

Through these rhythmic exercises, the attention of the pupils is demanded to discover the missing beats and the creative aspect came to view with filling the missing beats or measures, composing throughout, using note values/pauses they proposed, everything taking place in a friendly climate, favorable for working. The rhythmic reading was accompanied by body percussion and percussion instruments.

**Development of melodic creativity**

The activities meant to develop the melodic creativity of the pupils are based on musical auditions, the interpretation in various ways, improvisations, and musical games. Some games include new technology, where the pupils were instructed to operate with different software, to edit and to compose rhythmical-melodic examples using the programme *MuseScore*, to process the musical file in the programme Audacity, to search on the internet for various musical examples using Youtube, all these were done in a laboratory. The activities that concern melodic creativity are based on the logical-mathematical intelligence, pupils receiving different tasks that involve the association between numbers and musical sounds, or the steps and the distance between them. During these activities involving listening to musical parts, pupils have expressed through essays, poems or paintings, the message transmitted by the music or the simple emotional state existent during the musical auditions.

In relation with the development of musical creativity, through maintained work, kids can reached a superior stage, improvisation. Numerous specialists worldwide, who dealt with musical education for children, they attached great importance to musical improvisation, as Carl Orff.

Starting from the idea that improvisation represents an important means that prove the creative musical qualities of a person, we proposed to the pupils a melodic game during an assessment. To realize this activity, we selected four poems from the works of Romanian poets, consequently distributed to the pupils, each of them being assigned a verse. The rule of the game was through chain challenges, from one pupil to another, each improvising on a melody with the lyrics assigned (and projected in front of the class at the moment of the execution), respecting the metric system. The game was received with great enthusiasm by the pupils, each enjoying the spontaneous freedom. The pupils of the class appreciated the improvisation of each classmate, helping him/her, being encouraged to overcome his/her anxiety. The game
was efficient because all the pupils demonstrated melodic and creative aptitudes, succeeding to sing in public. At the end of the game all the pupils were appreciated and offered encouragement for the creativity demonstrated during the exercise.

The improvisational moments included in the didactic activities were numerous. The pupils had the possibility to sing known songs in diverse manners, modifying the tempo or the intensity, to be conductors in front of the class, conducting their classmates in the varied interpretation of the repertoire, changing tempo indications through clear gestures. These activities had an interactive character meant to bring out the creative side and the pupils involved enjoyed the lessons.

3. The control stage
At the end of the formative stage we can affirm that through the interactive activities developed during this didactic experiment, the level of creativity of the pupils reached a higher state, and helped them in operating more easily with elements of the musical language, to express themselves freely and to realize interdisciplinary connections, applied in their own creations. In the final stage of the didactic experiment, we applied a similar test to the one used in the ascertainment stage, to observe the development and growth of the creative potential of the pupils in the group submited to research.

Results

After the test apply in the ascertaining stage, with our group of 22 pupils, we can see that 4 (18%) of them have a low level of creativity, 7 (32%) have a medium level and 11 (50%) demonstrated a high level of creativity. The general score obtained by the class is 70.68 points.

**Fig. 1. The graphic representation of the initial tests**

After the formation stage, at the end of working activities we applied a similar test to the one from the beginning (in the ascertaining stage), and then we made a
comparative analysis of the results, using the same assessment criteria. A growth was noted in the creative potential of the pupils, the average score obtained in the final test registering an ascent from the initial test, as it can be observed:

![Graph](image.png)

**Fig. 2. Graphic representation of the final tests**

As a result of browsing the experimental stage, the results obtained by the pupils in the group submitted to the research we noticed a growth under all aspects traced over the research. The results of the students from the initial stage (pre-test) and summative (post-test), have been submitted to comparisons in order to demonstrate the significance of the differences obtained. Comparing the results registered by the students during the two tests, we can note a growth of the scores they obtained in the summative test, the class average being higher after the final test, **78.63** points, than the average of the class registered at the initial test, **70.68**.

We analyzed the level of creativity, pointing out the evolution of the pupils in regard to their own performances measured in the pre-experimental stage. The evolution of the pupils under the aspect of the three clues of creative evaluation is represented in the chart bellow:

![Graph](image.png)

**Fig. 3. Graphic representation of the pupils’ progress at a creativity level**

According to the data exposed on the chart, we can observe that at the end, the creative potential was registered with a growth, thus next to the level of low
creativity there are registered only two pupils as opposed to four existent in the ascertaining stage. The medium level of creativity on the final test registers with one student more, respectively 8 pupils as opposed to 7, registered in the initial test. In the case of a high level of creativity a slight growth is registered, with one student more as opposed to the ascertaining stage, thus in this level we can observe a number of 12 pupils after the final test, as opposed to 11 existent following the initial test.

The purpose of this research was to prove that through the involvement of pupils in various interactive activities, providing permanently the possibility for them to express themselves freely, acquiring more self-confidence.

DISCUSSION
After the formative experiment a progress was registered in all the pupils from the experimental directions, the children being capable to operate with elements of the musical language in a more efficient manner. The pupils developed their ability to realize interdisciplinary connections, to express their own opinions on a musical work and lastly, the ability to use, in a practical manner, the knowledge gathered. During the experiment we observed an improvement of the results of the pupils regarding the development of musical thinking and growth of the creative ability, this being one of our constant concerns, and the purpose of this paper is to illustrate and to capitalize on these aspects.

Every child is creative in his/her own way and our role, as a teacher, is to intervene and to support the pupil throughout his/her educational process, searching for the right tools to stimulate his/her creativity and to define him/her as an individual with a balanced personality.

The formation and development of the creative capacities assume special activities, organized actions and to continue the stimulations and activation of the creative potential, actions that act for the development of the pupils’ sensibilities, for developing the capacity to anticipatory and divergent thinking. For that, the teacher propose activities for an interactive learning, using methods, procedures and efficient learning techniques, with the purpose of developing the pupils’ creative thinking. We initiated this research project for stimulating the level of creativity, increasing their motivation to learn, intensifying the communication and acceptance relationships of all the students in the collective by enhancing each one, involving the student as an active character in their own formation. By encouraging pupils, through one open dialogue with each child, stimulating critical thinking and through kind gestures, we can help pupils, after secondary school graduation, to be more communicative, more powerful and more creative, get ready for nowadays ever-changing society.
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