PECULIARITIES OF DEVELOPMENT OF SENIOR PUPILS’ MUSICAL CREATIVITY USING MUSICAL COMPUTER TECHNOLOGIES (MCT) IN A MUSIC LESSON

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Abstract
The article presents the research results of the project ‘Development of Senior Pupils’ Musical Creativity Using Musical Computer Technologies (MCT)’ (No. MIP-13081), which was carried out by groups of scientists and financed by Science Council of Lithuania. In the introductory part of the article the concept of creativity is presented, the factors influencing it are discussed together with the possibilities of MCT in development of musical creativity. The main part of the article introduces the methodology and the results of the research on the development of senior pupils’ musical creativity using MCT in a music lesson. During the research 20 music lessons conducted by 10 music teachers were observed. The research revealed that the greatest influence on senior pupils’ musical creativity had the experience in application of MCT. Pupils who accumulated some experience were given freedom of creation. Meanwhile education of the ones who did not have it, was planned consequently presenting creative tasks from the simple ones (i.e. create rhythmic accompaniment) to quite complex tasks (to create a musical composition consisting of several parts). Evaluation criteria in most cases were not named, though in the process of creation pupils were provided with suggestions on how to improve their musical compositions. Most often the Magix Music Maker programme was used for creation.

KEY WORDS: musical creativity, musical computer technologies (MCT), music lesson.

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Introduction
Changes over late decades, focus on an intensive search for ways how to orientate education towards a learner, how to develop pupils’ abilities and their value-related attitudes, assisting in successful realization of oneself in life, have determined a rapid change of educational content. The documents regulating Lithuanian education (The Conception of Cultural Education of Children and Youth, 2008; general education plan of primary, comprehensive and secondary education of 2013–2014 and 2014–2015, general programmes of secondary education in Lithuania, 2011) state that educational content has to: correspond to every pupil’s needs and powers, to help him/her grow mature as a personality. In educational process the importance of development of competencies is raised more and more often, the focus is laid on practical, creative activities. Pupils should be able to perceive connections of ideas, create new ideas, and creatively apply accumulated experience in new situations. Creativity of a person is named as one of the most important aims of education.

In the works of contemporary scientists development of creativity, including musical creativity, is analyzed as multifold phenomenon. Some scientists (Mazzola, Park, Thalmann, 2011; Elliott, 1989) define musical creativity as an ability of a person to be creative in various musical activities. Others do not present any specific definition (Elliott, 1995; Azzara, 2002; Cope, 2005; Jorgenson, 2008; et al.), however, they claim that musical creativity manifests in such musical activities as composing, arrangement, improvisation, and performance. Some other researchers (Hickey, 2003; Mazzola, Park, Thalmann, 2011; Odena, Welch, 2009) discuss musical creativity referring to M. Rhodes’ (1961) ‘4P’ conception of creativity (Person, Process, Product, Place). As one of the most famous researchers on musical creativity of the late decades P. Burnard claims (2012), we cannot unambiguously define musical creativity. We have to investigate various musical creativities since their expression depend on different external and internal factors: on character of musical activity (Burnard, 2012), on pupils’ learning style, quality and quantity of accumulated knowledge (Novak, Cañas, 2013); on acquired musical abilities and creative surroundings (Elliott, 1999); on a teacher’s competence and organization of educational process (Elliott, 1999; Boardman, 2002; Odena, Welch, 2009).

Development of musical creativity is a challenge to a teacher. One has to decide how to plan and organize musical creative activity, what teaching/learning means to use, what musical tasks to present to pupils and how, what teaching/learning methods and evaluation/self-assessment methods to apply. When organizing musical activity, it is important to involve pupils into various forms of playing music, to encourage them to raise original musical ideas and to look for possibilities of their realization, to plan musical projects, and to participate in a long-term creative activity (Elliott, 1999); to present such musical tasks which would inspire pupils to risk, to behave unexpectedly (Hickey, 2003); to provide pupils with
opportunity to find the problem themselves and to look for the ways of tackling it (Runco, Chad, 1994; Hickey, 2003). According to G. Mazzola, J. Park, F. Thalmann (2011), strict rules set on creative activity and directly indicated means of creation can hamper development of musical creativity. Freedom of creation, variety of creative tasks, and benevolent surroundings should prevail in lessons (Fasko, 2001).

Creativity can be recognized by its results. According to J. D. Novak and A. J. Cañas (2013), appearance of the result of musical creativity – a musical product – is possible only when learning is conscious and meaningful, pupils are involved into creative activity. Participating in creative activity helps not only to internalize knowledge better, but also develops the ability to relate new knowledge to the old, teaches not only to memorize new information, but also to adapt it when raising ideas and creating new products. Therefore, it is very important to present tasks which would be oriented towards presentation of musical creativity, and particularly towards its result (Leong, Burnard, et al., 2012).

In the context of music education, assessment of musical creativity also depends on the evaluation criteria of the product of creation, which are chosen by a teacher and pupils. As S. Leong, P. Burnard and others (2012) claim, tasks that are formulated by a teacher during creative activity can be oriented not only towards development of creativity, but also towards the pursuit of pupils’ music mastery, towards improvement of their musical skills, towards improvement of quality of music performance. Meanwhile, when assessing the product of musical creativity the following criteria are most often distinguished: novelty, minuteness of solution of the problem, integrity, originality, appropriacy, value (Leong, Burnard, et al., 2012). Some scientists (Murphy, 2002; Leong, Burnard, et al., 2012) claim that when assessing a teacher must be flexible, he/she must be able to evaluate the idea and its realization as a unique and valuable result of musical creativity. When the criteria of musical creativity are flexible, a teacher encourages pupils to make decisions, to be responsible for their choices, to ask questions courageously and to look for answers themselves.

Environment also influences expression of musical creativity (Grakauskaitė-Karkockienė, 2003; Hunter, Bedell, Mumford, 2005; Wiggins, 2006; Plucker, Makel, 2010; Beresnevichius, 2011; Girdzijauskiene, 2012; et al.). According to R. Girdzijauskiene (2012), psychological climate, character of educational process, and a personality of a teacher are important to development of creativity. Stimuli and help given by a teacher at an appropriate time are also significant to successful development of musical creativity. Some authors point out positive relationships, presence of challenges, constant stimulation of intellectual activity, flexibility, and physical environment as the most meaningful factors of psychological surroundings (Hunter, Bedell, Mumford, 2005). According to G. Beresnevichius (2011), general atmosphere together with physical environment have to be appropriate to creative activity, have to correspond to the needs of a creator.

While creating music using MCT, available creative means are particularly important. According to Ch. Criswell and E. Menasché (2009), MCT can be divided into five categories: 1) means of teaching and learning: technical or computer, software for teaching/learning music theory, and etc.; 2) electronic, computer equipment for performance of music: electronic music instruments, virtual instruments, and etc.; 3) software for creation of music, i.e. music programmes allowing to create music from presented music templates; 4) music software allowing to record, edit, mix or otherwise change audio or MIDI soundtracks; 5) technologies of sound recording and reproduction: audio equipment, mixers for sound recording and transmission, and etc. All above-mentioned technologies can become effective means of pupils’ involvement into activity of music creation (Watson, 2011; Criswell, Menasché, 2009; Burnard, Finney, 2007; Crow, 2006).

It has not been long since the beginning of implementation of MCT in Lithuanian schools. Over late years during the project ‘Infrastructure of Technologies, Arts, and Natural Sciences’ initiated by the Ministry of Education and Science of Lithuania more than 150 schools were provided with computer music teaching means and sets of MCT equipment. However, as the research results show (Rimkutė-Jankuvienė, 2014), not all teachers use MCT in music lessons, and not always they are easily accessible to pupils. There are no research revealing opportunities of development of pupils’ musical creativity using MCT. Therefore, there is a question how pupils’ musical creativity using MCT is developed in a music lesson.

The object of the research – development of senior pupils’ musical creativity using MCT in a music lesson. The aim of the research – to reveal the peculiarities of development of senior pupils’ musical creativity using MCT in a music lesson. The methods of the research: analysis of pedagogic, scientific literature, and educational documents, observation of music lessons of senior pupils.
Research methodology

With the aim to reveal the peculiarities of development of senior pupils’ musical creativity using MCT in a music lesson formal observation was applied during which the following aspects were noted: 1) Pupils’ activity. The aim was to reveal the level of pupils’ involvement into creative activity and the problems arising in the process of musical creation. 2) The peculiarities of organization of educational process. The aim was to reveal how educational process was planned and organized, what creative tasks were presented and in what sequence, what was the role of a pedagogue while organizing pupils’ creative activity. 3) Musical compositions created by pupils and the character of their evaluation. 4) MCT installed in computers and used for creative tasks. The aim was to reveal what MCT were ready for usage in music classrooms and which ones were used for development of musical creativity. During observation short notes were taken where the main facts of educational process were recorded. Detailed notes (thoroughly described course of the process) were taken after observation. Additional information was received during the research, having talked to the music teacher before and after music lessons.

Twenty music and MCT lessons conducted by 10 teachers in various towns (Vilnius, Kaunas, Klaipėda, Šiauliai, Panevėžys, Tauragė, Kelmė, Marijampolė, Elektrėnai) were observed. Teachers were selected referring to the results of the questionnaire (Rimkutė Jankuvienė, 2014). The questionnaire was filled in by 80 music teachers, 10 of them were observed. Music lessons for observation were selected purposefully and were conducted by the teachers having experience in use of MCT or actively using MCT in the process of development of pupils’ musical creativity. Two lessons of each teacher were observed.

With the aim to obtain realistic data and to reduce the possibility of subjective distortions, a plan for analysis of a lesson was created. According to L. Joyaiša (2007), while analysing a lesson, attention should be paid to the following aspects of educational process: teaching aims, teaching content, purposefulness of choice and application of teaching methods and means, activeness of pupils (attention, motivation), the role of a pedagogue, the result of a lesson, hygienic conditions (surroundings). Above mentioned aspects of the process are closely related to the ‘4P’ (Person, Process, Product, Place) conception of musical creativity. Referring to this, the following aspects of music lessons were observed and analyzed:

1. Pupils’ activity. The attention was paid to the character of pupils’ involvement into activity and what problems arose while using MCT for performance of tasks of music creation.
2. Organization of educational process. It was inquired what methods were applied to develop musical creativity, what teaching material and tasks were presented, what help was provided to pupils.
3. The product of pupils’ creation. It was observed what musical products were created in a lesson how they were evaluated by a pedagogue and other learners.
4. The place. During the research only some parameters of physical surroundings were taken. The aim was to find out what MCT were installed in the music classrooms, which ones were used for performance of creative musical tasks.

The research results

1. Pupils’ activity. Taking into account how pupils participate in creative musical activity, lessons can be divided into two groups. In the first case all lesson time is devoted to musical creation, all pupils create music using MCT. In other types of lessons creative activity is combined with teaching of music theory and history. In such lessons a part of pupils create music using MCT, while the others study music theory and history.

In both cases pupils create independently using MCT, however, the level of involvement into activity differs. In the lessons where a part of pupils create music using MCT while the others study music history, the atmosphere is a little chaotic, the activity is performed superficially. Engagement of the pupils’ group in the activity of musical creation is kept only for a part of the lesson, later discussions, sharing of information with classmates start (‘Look, what effect I have found, take my headphones and listen’).

The pupils who have experience in use of MCT are more active and get more involved into musical creation, they create music not only at school, but also at home. In the lessons they use their personal laptops or a classroom computer with additionally installed music software. The number of such pupils is not big, however, in all the lessons observed there were 1–2 of them. Teachers claim that these pupils
start creating music in junior forms, they are acquainted with the specific character of working with MCT and there is no need to explain technical abilities of the software. They come to music lessons already having the idea of a composition and are independently looking for the ways of its realization. However, these pupils lack knowledge of musical theory, they do not know the principles of arrangement, they create music following the ‘rule’ – sounds well/not well. In music lessons (and often during breaks) teachers are approached with purposeful questions related to music arrangement: how to create harmonious accompaniment to his/her melody, how to develop dynamics of the composition, how to complete a form of a composition appropriately, and etc. Moreover, pupils encounter problems regarding combination of separate elements of the composition into the whole (i.e., ‘teacher, I feel there is something wrong, does not suit, does not sound well’). However, the creative process itself is fluent, without greater distortions.

The pupils who do not have experience in use of MCT get involved into musical creative activity differently. Their involvement is restricted by the lack of musical experience and insufficient knowledge of technical possibilities of the software. The problems occurring while using MCT are encountered (possibilities of musical effects, settings of duration and dynamics of a composition, and etc.). There is a lack of time to achieve artistry of a composition and expressivity of the idea. In lessons these pupils perform small creative tasks, not always look for original, unique means of musical expression for realization, performance of the task lasts less than a lesson. Pupils need more time in the beginning of tasks, especially when raising musical ideas. However, when accomplishing them, the level of involvement increases: pupils enthusiastically share the information obtained, rejoice original solutions.

2. Organization of educational process. The character of organization of educational process of the observed lessons can be distinguished into two types: structurized and individualized. The first type is typical of consequent planning of educational content – from theory to practice. It has been noticed that in many cases the main information is presented in the first lesson of the new topic cycle, later for some lessons music is created according to the tasks presented by a teacher. Majority of teachers plan educational content minding methodological material ‘Musical Computer Technologies’ that is easily accessible in the electronic library of a pedagogue of the website presented by Education Development Center, teachers also supplement to this material and adapt it to the knowledge, abilities, and needs of pupils. While using this material, teachers provide pupils with knowledge of music creation using computer technologies. Practical tasks are also presented observing the above-mentioned methodological material, and in some cases they are taken from other sources that are known to the teachers and easily accessible in the Internet.

The sequence of tasks presented is consecutive – these are the tasks supplementing each other, the result of which is a complete musical composition. Musical creation is started from creation of constituent parts of a small musical composition. For instance, the task is to create rhythmic or harmonious accompaniment to the melody, introduction or the ending of a composition. Pupils are purposefully acquainted with the elements of musical language (i.e., rhythm, melody, harmony, a form of a composition). They are encouraged to create the melody of a school bell from lesson to break, the ringtone of a mobile phone. In the other stage the tasks are more complex, oriented towards the feeling of stylistics of a composition. Pupils are suggested to arrange a melody in different styles, for example, relax, hip-hop, rock. Later, a form of a musical composition is analyzed and only then compositions consisting of several parts and/or musical compositions of a greater extent are created. The creative process itself takes place in the following stages: 1) a creative idea is raised/presented; 2) the ways of its realization are discussed; 3) the idea is accomplished using selected ways; 4) the creative result is presented; 5) the result is evaluated/self-assessed. Depending on the character of the task, the whole process of creation of a musical composition lasts for 3-7 lessons. In the lessons observed various stages of creative process were noted. Most lessons were devoted to the realization of the creative idea.

The tasks of musical creation while using MCT differ depending on pupils’ musical experience and their experience in use of MCT. The pupils who have it come to a lesson already having the image of a future musical composition, they create music not only during lessons, but also at home. In the lesson a teacher usually helps to solve the problems that have been encountered, they present their observations and evaluations. This is individualized teaching, which was applied by 2 out of 10 teachers who participated in the research. In such case pupils are presented with clear activity goals, they have possibility to set creative goals themselves, as well as to choose the ways of creation, to plan the time devoted to creation, to foresee the character and terms of presentation of creation. Pupils are expected to present original results of creation. When applying individualized teaching, the role of a pedagogue
changes from a traditional conveyor of knowledge to a pedagogue assistant, consultant. Teachers present just essential information, necessary to creation, they also discuss the possibilities of technical solutions. The greatest attention is paid to individual consultations, to evaluation of creative decisions, to presentation of specific information urgent to pupils.

3. **Product of pupils’ creation.** Any musical product created by pupils is called musical creation. In the lessons observed the following results of pupils’ creation were noted: original melody, rhythmic and/or harmonious accompaniment to melody, introduction/the ending of a musical composition, musical compositions serving a specific purpose (e.g., ringtone, sound of the alarm clock), independently created musical compositions, arrangement of a known musical composition in a selected style, choosing other instruments, changing the form of the composition. Pupils’ creation depend on accumulated experience, on situation of learning to create (e.g., how long pupils learn to create music using MCT). Often in lessons pupils perform creative tasks of different complexity: some pupils create music independently according to their own idea, others perform the music creation tasks of a ‘primer’ level. All the teachers who conducted the lessons observed preserved pupils’ creation and used it when discussing the regularities of musical creation, foreseeing the possibilities of improvement of compositions, and formulating the criteria of evaluation.

In the lessons observed teachers’ attention to innovative, original pupils’ ideas, nonstandard ways of their realization manifests itself. Particularly benevolent opinions about creation were expressed when: various musical instruments were chosen, melody of different moods and rhythmic accompaniment were combined, the climax of the composition was in non-typical place, and etc. Assessment of pupils’ creative works was related to the establishment of quality criteria, to the search of opportunities for improvement.

However, only in solitary instances (in three out of 20 lessons observed) pupils’ creation was evaluated by mark, and evaluation criteria were poorly related to the quality of the composition itself, i.e. pupils’ efforts, the progress made in the process of creation were evaluated. Much more often a teacher listened to the compositions, marked their strongest sides, presented remarks and suggestions.

It was noticed that in majority of lessons evaluation criteria were not clearly stated. Teachers more often suggested what a pupil could improve (e.g., ‘introduction could be shorter’ ‘a composition should have a more distinct climax’, ‘think about the ending of the composition, it is as important as the beginning’, ‘rhythmic accompaniment should coincide with the rhythmic drawing of the melody’). Only in one of the observed lessons clear requirements to creation, as well as evaluation criteria, were set: ‘the extent of the composition should be from 0.5 to 1 min.; major mode is compulsory; character energetic and joyful or calm, not disturbing, helping to concentrate; original use of at least one element of musical language is compulsory; a composition must have clear beginning and ending; additional mark is given for an interesting idea’). Consequently, insufficient attention is devoted to evaluation of compositions and to quality criteria.

4. **Place.** During the research it became clear that the development of senior pupils’ musical creativity using MCT takes place in appropriate physical surroundings. Warm tones prevail in the classrooms, there are a lot of visual details (paintings, concert posters, diplomas), windows face the views of nature. All music classrooms have video projectors, a teacher’s computer, however, not everywhere classrooms are equipped with computers, software necessary for pupils’ creation is not installed. In some cases two pupils work on musical creation at one computer.

Though the research was carried out in schools that in accordance with the project ‘Infrastructure of Technologies, Arts, and Natural Sciences’ were provided with computer-based music teaching means and sets of MCT equipment, the classrooms where the lessons were observed differed in the level of technical supply.

Half of the classrooms that were observed were allocated to general teaching of music with traditionally standing desks, with some computerized workplaces for pupils, various music instruments, a computer for a teacher, a projector, and other technical equipment. Other classrooms were small specialized rooms meant only for the subject of computer music technologies. Only two of ten teachers observed worked not in music classrooms, but in classrooms with 15-25 computers, multimedia, and a computer for a teacher.

Majority of pupils performed tasks of musical creation using the programme of **Magix Music Maker.** In this and in other programmes of similar type there are quite a lot of music templates that they use for composing a new work. There were cases when teachers allowed independently working pupils to use other software for creation of music, such as **Garage Band, FL Studio,** which were not installed in classroom computers. Software for notation, namely **Sibelius, Finale,** were used as well.
During observation and interview with the teachers it became clear that classrooms abundantly provided with MCT were not compulsory for successful development of musical creativity. It was more important that the software installed functioned properly. During the research disturbances of software installed were often observed. In some observed lessons when the programme Magix Music Maker stopped working, pupils had to wait until the teacher solved software problems. Therefore, teachers sometimes advised not to use one or another programme.

Conclusions

Due to different experience in the field of use of MCT, the level of pupils’ activeness and involvement into musical creative activity differs. The pupils who have some experience in use of MCT, independently raise musical ideas, create music not only during lessons, but also at home. They do not encounter problems regarding use of MCT, teachers are approached only regarding interconnections among elements of musical language and purposefulness of choice of a composition form. The pupils who do not have experience in use of MCT firstly appropriate the possibilities of music creation provided by MCT and perform quite simple creative tasks.

Educational content is actualized and contextualized relating development of musical creativity to pupils’ musical experience and experience in use of MCT. The pupils who create music independently and have mastered MCT, are provided with freedom of creation. In these cases a teacher plays the role of a consultant, an assistant. For the pupils who do not have experience in use of MCT educational process is planned consequently, creative tasks presented vary from small musical works to creation of more complex musical compositions of various genres.

The following musical products created by pupils in music lessons have been noted: original melody, rhythmic and/or harmonious accompaniment to melody, introduction/ending of a musical composition, musical compositions serving a specific purpose, musical compositions created in accordance with a pupil’s idea, arrangement of a known work in a chosen style. In most cases evaluation criteria are not set in advance, though in the process of creation every pupil is provided with suggestions on how to improve a musical composition. Purposefulness of length, harmony, and a choice of form are emphasized.

Music classrooms are equipped with computerized workplaces with MIDI keyboards for pupils’ musical creation. In other schools ICT classrooms are used, pupils are encouraged to bring their own computers, to create music using other programmes than the ones installed in class computers (f.e. GarageBand, FL Studio). During lessons Magix Music Maker programme is most often used for musical creation, though some disturbances occurring while using the programme impede the process of creation.
muzikinių gebėjimų, kūrybinės aplinkos (Elliott, 1999); mokytojo kompetencijos ir ugdymo proceso organizavimo (Elliott, 1999; Boardman, 2002; Odena, Waller, 2009).

Muzikinio kūrybiškumo ugdymas – išsūkis mokytojui. Jis turi nuspinkėti, kaip planuoti ir organizuoti muzikinę kūrybę veiklą, kokias mokymo(si) priemonės pastelkė, kokias ir kaip muzikines užduotis mokiniams pateikti, kokius mokymo(si) ir (jis)vertinimo metodas taikyti. Organizuojant kūrybę veiklą svarbu įtakoti mokinius į įvairias muzikavimo formas, skatinti kelti originalių muzikines idėjas, išskoti jų įgyvendinimo galimybių, planuoti muzikinius projektus, dalinti ilgalaikėje kūrybinėje veikloje (Elliott, 1999); pateikti tokias muzikines užduotis, kuriuos skatintų rizikuoti, pasiekti nepristatį (Hickey, 2003); suteiki galimybę mokiniams patiems atrasti problemų, išskoti jos sprendimo būdų (Runce, Chad, 1994; Hickey, 2003).


Tyrimo metodologija. Siekiant išsiaiškinti aukštesniųjų klasijų mokinių muzikinio kūrybiškumo ugdymo naudojant MKT muzikos pamokose ypatumus atliktas formalusis stebėjimas, kurio metu analizuota: mokinių veiklą, ugdymo proceso planavimas ir organizavimas, mokinių sukurti muzikos kūriniai ir jų vertinimo pobūdis, kabineto esančiose kompiuteriuose idėjotos ir kūrybinės užduotis naudojamos MKT. Stebėta 20 muzikos ir kompiuteriinių muzikos technologijų dalykų pamokų, kurias vedė 10 mokytų įvairiuose šalies miestuose (Vilnius, Kaunas, Klaipėda, Šiauliai, Panevėžys, Tauragė, Kelmė, Marijampolė, Elektrėnai).


Muzikos kabineto mokinių muzikai kurti įvairios muzikos technologijos: audio suidėjimo technologijos, mišrinio pultų garso įrašymo technologijos, muzikos kūrimo programinė įranga.


