The characteristics of applying computer technologies in the process of musical education

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Abstract

On the basis of research material analysis the paper aims to determine the changes happening in music education, which were brought about by the application of computer technologies. The possible trends of applying computer technologies in musical education are analyzed. The changes in the society and the development of computer technologies promote a new approach to the process of musical education. The use of computer technologies in the process of musical education presents new opportunities: music can be recorded, created, it is possible to ply different instruments, learn the theory of music, develop one's hearing, search for new information by means of the internet resources. Computer technologies is significant for the professional competences of the trainee teachers of music and can complement tne training of teachers of music. The article presents the analysis of the future teachers' attitudes to the application of computer technologies in musical education and highlights the characteristics of computer technologies use. The results of the survey demonstrate that there appear aspects of using computer technologies in the education process that need to be improved. Hence, it is important to look for ways to convey the knowledge of music and skills more efficiently.

 Keywords: computer technologies, musical education, preparation of music teachers.

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1. Introduction

Nowadays computer technologies (CT) are no longer an innovation, but they give new opportunities for the process of education. Many researchers [9, 1] state that the use of CT enhances the efficiency of the education process. The development of CT has changed the content of all education, including the musical education process. In music, just like in other spheres, technological progress gives an opportunity to search for new ways of expression. In musical education CT opens new possibilities: music and sound can be recorded, created, composed, edited, played on different instruments, sounds and music can be analyzed, new information can be searched on the internet etc. [4]. CT can be a great assistant in a variety of musical activities. In one of his interviews Steve Jobs said: "We believe that when technology gets married with the humanities, we get results that make our hearts sing" [8]. It could mean that the content becomes very significant, therefore, is essential to know what possibilities CT can have in musical education. Nevertheless, the integration of CT in the process of musical education is not simple. In modern music pedagogy three spheres of musical activity are typically distinguished: musical expression; listening to music, its description, evaluation and recognition of music in the socio-cultural environment [13]. In each of these spheres CT can play a significant role, yet it is not enough to be acquainted with the musical technological means. One has to be able to use them in a reflective way: evaluate, understand when the computer can be useful, and when it should not be used. CT tools are not always favorably assessed.

The application of computer technologies in musical education has been analyzed by the Lithuanian and foreign researchers [11, 2, 3, 5, 15, 7]. The conducted studies theoretically and practically analyze the role of CT in music, the integration of technologies in primary school musical education, the use of technologies for the development of creativity, etc. Such research would help to reveal the ways how modern CT can be efficiently applied to teach music and improve the training of music teachers.

1.1. Problem statement

The research problem is formulated by the following questions: what is the students' experience in the application of CT and what are the advantages and disadvantages of the application of CT in the process of music education.

1.2. Purpose of study

The aim of the research is to determine the characteristics of applying computer technologies in the process of musical education.

2. Research design

2.1. Participants

93 first and 56 fourth year students of music pedagogy at Lithuanian University of Educational Sciences (LUES) took part in the survey. The research was carried out in 2012-2014.

2.2. Research methods

Literature review, questionnaire, qualitative and quantitative (content analysis) data analysis. On the basis of literature review there was a questionnaire prepared in advance. The questionnaire consisted of closed- and open-ended questions. The first group of questions aimed to reveal the use of CT, the possibilities and aims. The second group of questions consisted of open-ended questions focusing on the advantages and disadvantages of the application of CT in the process of music education. The qualitative content analysis was a methodological text analysis within the limits of those texts on the basis of methodologically grounded principles of analysis [10].

3. Results

With the view to analyze the aspects of using CT in the process of musical education, the first year students were asked how much time they spend working on the computer every week. 37.6 % responded that they spend more than 5 hours, 19.4 % said that they work on the computer from 3 to five hours a day, 35.5 % - from 1 to 3 hours, and 7.5 % - less than 1 hour.

The Standard of Teachers' Computer Literacy [14] defines the term "computer literacy" broadly: it covers the knowledge and skills of using CT in education and defines the general level of teachers' information culture. When the respondents were asked to assess their general level of computer literacy, their answers showed that more than two thirds (69.9 %) of the respondents are able to work on the computer quite well, 26.9 % of the interviewees said that their level of computer literacy is low, and only 3.2 % of the respondents said that the level of their computer literacy is very good and they possess the European Computer Driving License (ECDL).

Table 1. The Students' Purposes of Using Computer Technologies (%)

Purposes	Daily or almost every day	Once a week	Once a month	Never or hardly ever
Surfing the internet for study material	53.8	37.6	8.6	0
Preparing reports for lectures and conferences	26.1	37.6	36.3	0
Working with educational music software	15.1	24.7	34.4	25.8
Working with music creation software	11.8	8.6	18.3	61.3
Surfing the internet for leisure	60.2	21.5	8.6	9.7
Personal interaction (Facebook, e-mail, Skype, MSN etc.)	76.3	16.1	6.5	1.1
Online services (shopping, paying the taxes, e-banking etc.)	62.3	18.8	15.4	3.5
Playing games	10.8	5.4	25.8	58.1

The research data show (see: Table 1) that the most popular purpose of using the computer is personal interaction (76.3 %), more than two thirds (62.3 %) prefer online facilities, a similar number of the respondents (60.2 %) surf the internet for leisure, more than a half (53.8 %) of the respondents surf the internet to find information for their studies and less than a third (26.1%) – prepare reports for lectures and conferences. The first year students are not well acquainted with educational and music creation software. 25.8 % of the respondents say that they have never used educational music software and 61.3 % have never used any software for

music creation. It shows that the computer is rarely used as a teaching aid in musical education and the first year students are not aware of these technological possibilities. As a result, it is possible to assume that the integration of CT into the process of musical education can increase the students' interest since they find technologies as an attractive environment for communication, search for information and other interactive activities.

The use of innovative CT is inseparable from the application of computer software. The survey aimed to determine what software is mostly used by the students. The results show that the first year students mostly use the following software: *Internet Explorer, MS Power Point, Media Player, MS Word.* Less than a third of the respondents use the following musical software: MAGIX *Music Maker, Karaoke Player, Fruity Loops (FL Studio), Cubase*. Consequently, it can be stated that the students use the widely spread, most popular types of software, but are poorly acquainted with the application of CT and their possibilities in musical education. The first year students' inability to work with music software can be determined by the fact that in the majority of cases students become acquainted with those programmes informally, unconsciously, while studying individually. Therefore it is essential to plan and prepare methodological and technical aids that would help the students improve their skills necessary for work with musical CT.

Table 2. Advantages and Disadvantages of CT Application in the Process of Music Education

Category	Subcategory	Number of answers	Supporting statements
Advantages of CT in music education	Enhancement of motivation	14	„...the subject becomes more interesting..." „...the motivation to learn music subjects grows..." „...more interesting lectures, a greater motivation to learn..." „...much greater interst and involvment..."
	Promotion of cooperation	11	„...promotes cooperation..." „...team work in project preparation ..." „...we exchange information via email ..."
	Poromotion of creativity	10	„...creativity is developed..." „...I can create music..." „...it can help to implement my ideas..."
	Facilitation of music education process	8	„...facilitates learning the circle of quints..." „...helps to render knowledge in greater detail..." „...a lot of material for learning the theory of music..." „...enables self-dependent learning ..."
	Competence development	7	„...to deepen music competences..." „...expands the knowledge and skills of music..." „...helps to efficiently memorize thelearning content..." „...I can expand my knowledge..."
Disadvantages of CT in music education	Lack of knowledge and skills	3	„...the number of classes on music software is insufficient..." „...sometimes the knowledge and skills are insufficient..." „...there is a need for methodological support concerning the ways of using music CT..."
	Lack of equipment	3	„...there is a lack of music software..." „...there is a need for more classrooms equiped with computers..."

The focus was also on the fourth year students' opinion about the advantages and disadvantages of applying CT in the process of music education (see: Table 2). During the qualitative data analysis the research data were grouped into 2 categories: the advantages of CT in music education and the disadvantages of CT in music education. In the category of the advantages of CT in music education there were five subcategories distinguished: enhancement of motivation, promotion of cooperation, promotion of creativity, facilitation of the music learning process, competence development. The students indicated that the application of music CT "…*their motivation to learn music subjects grows…", "the subject becomes more interesting…",* there appears *"…a greater inclination to learn…"* The respondents also mentioned that music *CT "…promote their cooperation…", "help to render the information in greater*

detail…", "…develop creativity…" and help *"…to deepen their music competences…".* In the category of the disadvantages of the application of CT in music education the number of the subcategories distinguished was smaller than in the category of advantages. There were only two of them: lack of knowledge and skills and lack of computer equipment. It was determined that only a small parts of the surveyed students believed that *"…the number of lectures on music CT is insufficient…",* who felt like having *"…more methodological information about the ways of using music CT…"* and who thought *that "…there is not enough music software…".* Summing the research data up it can be argued that students want to learn the things that interest them; hence, their motivation to learn grows; CT facilitates the process of music education, develops music competences and promotes cooperation and creativity. Thus, in the process of music education CT trains the students' thinking skills, helps to achieve higher learning results and enables the development of their professional skills.

4. Discussion

CT can be used in music in a variety of ways and the possibilities are considerable. For example, computer technologies can perform the function of musical instruments (sources of sound) or they can facilitate creating music, performing, recording and analyzing it. In most cases the computer helps to record music: in the form notes, a matrix, a list, various schemes or sound waves [12]. In the process of musical education the functions of CT can be classified. They can be used as teaching tools, learning tools, a learning environment, tools of cooperation, therapeutic aids, diagnostic tools, administrative tools, etc. [6].

The ways of learning music based on CT offer new possibilities. In the process of musical education it is possible to apply the following:

- Demonstration, video and sound playback software (*Microsoft Power Point, Prezzi.com, Open Office Presentation, Windows Media Player, Karaoke Player,* etc*.)*;
- Educational music software (*Musition, Music Ace, Groovy Music,* etc*.)*;
- Software for modeling, composition and music creation (*Mažasis Mocartas, Magic Music Factory, Rythm Maker, Soundation, Dance E-Jay, MAGIX Music Maker, Band in a Box* etc*.);*
- Systems of testing music and simulators (*Auralia, Ear Master* etc*.)*;
- Software for rendering musical texts (*Sibelius, Finale, Maestro,* etc*.);*
- Regular software (*Microsoft Word; Microsoft Excel; Windows Media Player, Winamp; Windows Movie Maker; e-mail,* etc*.);*
- Interactive boards (*ActivInspire, SMART Notebook,* etc.);
- Virtual learning environments (*Moodle, discussion forums, video and audio conferences,* etc.);
- Online music resources (*Encyclopedia of Classical Music, New Groowe Dictionary of Music,* etc.).

All the aforementioned CT tools are used in the process of musical education at LUES, and the higher the module the more complicated, conceptual tasks are assigned. In the last module the elective musical education is based on creative activity using CT. Hence, today the process of musical education at the university is inseparable from the use of CT.

5. Conclusion

The results of the empirical research revealed that the computer literacy of the future teachers of music is sufficient, they use CT quite frequently and spend quite a lot of time working on the computer. The most popular purposes of using the computer are: personal

interaction, online services, leisure, search for information on the internet for studies; however, in musical education CTs are rarely used and students are not aware of the technological possibilities. The respondents prefer using the usual software: *Internet Explorer, MS Power Point, Media Player, MS Word.* Less than a third of the respondents use the following musical software: *MAGIX Music Maker, Karaoke Player, Fruity Loops (FL Studio), Cubase.*

The data of the qualitative research revealed that, in the students' opinion, the greatest advantages of using CT in the process of music education are thr facilitation of music learning process, the development of competences, the enhancement of motivation and promotion of cooperation and creativity. A small part of the respondents acknowledge that they lack the skills and knowledge about the application of CT in the process of music education and they would like to have more computer equipment in their classrooms.

References

[1]Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' technological pedagogical content knowledge and learning activity types: Curriculum-based technology integration reframed. *Journal of Research on Technology in Education, 41*(4), 393–416.

[2]Brown, R. A. (2007). *Computers in music education.* New York: Routledge.

[3]Burnard, P. (2007). Reframing creativity and technology: Promoting pedagogic change in music education. *Journal of Music, Technology and Education, 1*(1), 37–55.

[4]Burneikiene, N., Jarienė, R., Jašinauskas, L., Motiejuniene, E., Neseckiene, I., & Vingeliene, S. (2005). *Informacinių komunikacinių technologijų taikymo ugdymo procese galimybės.* Vilnius: Švietimo plėtotės centras.

[5]Burns A. M. (2008). *Technology Integration in the Elementary Music Classroom.* USA: Hal Leonard Corporation.

[6]Dudzinskiene, R., Kalesnikiene, D., Pauriene, L., & Zilinskiene, I. (2010). *Inovatyvių mokymo(si) metodų ir IKT taikymas. II knyga.* Vilnius: Ugdymo pletros centras.

 [7]Gall, M., Sammer, G., & De Vugt, A. (2012). European Perspectives on Music Education 1: New Media in the Classroom. Inssbruck- Esslingen-Bern-Belp.

[8]Isaacson, W. (2012). *Steve Jobs. Oficiali biografija*. Kaunas: Obuolys.

[9]Lawless, K., & Pellegrino, J. (2007). Professional Development in Integrating Technology into Teaching and Learning: Knowns, Unknowns, and Ways to Pursue Better Questions and Answers. *Review of Educational Research, 77*(4), 575–614.

[10]Mayring, Ph. (2014). *Qualitative Content Analysis: Theoretical Foundation, Basic Procedures and Software Solution.* Social Science Open Access Repository SSOAR.

[11]Rudolph, T. (2004). *Teaching Music with Technology*. Chicago: GIA Publications.

[12]*The General Programme of Computerized Music Technologies for Learners of Secondary Education* (2007). Vilnius: Svietimo aprupinimo centras.

[13]*The General Programmes for Lithuanian Schools of Primary and Basic Education* (2008). Vilnius: Svietimo aprupinimo centras.

[14]*The Standard of Teachers' Computer Literacy* (2001). Vilnius: Svietimo aprūpinimo centras.

[15]Watson, S. (2011). *Using technology to unlock musical creativity.* USA: Oxford University Press.