Information and Communication Technology in Art Education

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Computer Aided Learning or Learning Computer as a Musical Instrument? – Composers’ View at the Pedagogical Problem (on Materials of the 29th ISME World Conference).

Although ICT are widely used in educational establishments of many countries and their advantages are undeniable, researchers attract attention to the fact that music teachers’ approach to them is ambiguous. For instance, Sheau-Yuh Lin, who investigated the exemplary school programs for teaching music composition with the aid of technology that are used in the US, says that there is a gap between perceived potential of technology and its actual use in empirical studies of children’s composition in music [1].

In Taiwan primary schools ICT integration into education process is not so widely spread, and on the whole teachers confine themselves to low level of such integration (playing CD or watching video-materials) or use these tools only for their own needs [2].

A Norwegian researcher Ingrid A. R. Grøndal complains that despite the abundance of various digital devices in local schools only 20% of teachers use digital recording regularly and just 15% deploy computer programs for notation. Teachers say that it is not technological aspect that constrains them, but uncertainty of how to use music computer programs effectively from pedagogic point of view [3]. At present, says Ingrid A. R. Grøndal's University colleague Magne Espeland, the question if computer technologies should be used is no longer relevant. It is another question that has no answer yet – of producing knowledge that will facilitate their effective use in order to develop students’ music perception, their performing activity and improving musical education as a whole [4].

This thesis is being developed by New Zealand researcher Stuart Wise: although a great number of books, written in popular rhetoric, about computer technologies that revolutionize education are available, in practical education one can talk of some sort of “re-shuffling of the cards” – “there is little evidence of anybody trying a new game (Hennessey, Ruthven and Brindley,
2005)». Then he raises questions that can be considered as the key questions in the given music pedagogic sphere: “Is technology a new means of serving traditional goals of musical education, or can it do something different? Is it able to bring real world experience into classroom?” [5]. We shall try to find answers to these questions.

There are two methods in musical and educational practice that uses ICT: Computer Aided Instruction (CAI) and Computer Aided Learning (CAL).

Music teachers associate the first method with a number of computer devices that help to develop necessary skills. A music lesson with these devices is considered to be a good one, if students in the first place work as musicians. The second method is associated with developing interest to learning, making students’ critical thinking, creative and research work more active, stimulating independent educational efforts [6].

Both methods, however, do not take into account the purpose of ICT-based education. It can target acquiring traditional music competence or teaching students electronic and computer musical creativity, which has its own pronounced specific character and demands special skill.

There are six sectors of musical education where ICT are used: electronic instruments, notation programs, sequencer programs, teaching programs, Internet, Multimedia (Technology Institute for Music Educators, 2004) [1]. In this list could be included other programs that are often used in the students’ musical art: music constructors, auto arrangers, audio editors and virtual synthesizers. But again, in this sector the purpose of education can be the ground for defining educational and musical spheres of ICT application.

These technologies have become authoritative in both educational methods. But while developing traditional music competences can be based on above-mentioned technologies, in particular, teaching computer programs and many other, including Internet and various multimedia programs, to introduce students into art of electronic and computer music it is necessary to take into consideration both instruments and their application. From this point of view ICT should be regarded as specific musical tools.

The last few years saw quite a number of promising pedagogic publications related to Internet [7, 8, 9, 10, 11, 12, 13, 14, 15, 16], computer programs [17, 18, 19] and media programs [20, 21, 22, 23] that target developing traditional music competences. But how do matters stand in the sector of introducing students to the musical creativity which is based on digital technologies?

The electronic keyboard and the digital piano are the most evident successors of mechanical key instruments in the musical art and are widely used in this sphere. A new method of teaching groups of children under school age to use digital piano appeared in China. Children acquire basic skills of playing the piano, sing children songs, accompany themselves on the piano and sometimes improvise on the instrument [24].
In the USA playing in the ensemble of digital pianos is one of the forms of musical work with pensioners. This activity improves their key techniques, articulation, phrasing, rhythm and dynamic contrasts. The opportunity to make music with people of the same age is an important factor which helps to enjoy the activity [25].

Naturally, electronic key instruments are used for teaching school children and students, for example, for making them accustomed to free improvising [26]. Still, authors of such pedagogic publications, as a rule, do not carefully differentiate between traditional and digital key instruments, do not see specific character of the latter. However, any modern electronic musical instrument, including musical computers (equipped with a sound card, speakers, MIDI-keyboard and necessary software) gives the user opportunities to learn musical creativity that are incomparable to mechanical instruments – both from the point of view of availability and quality of the created product.

An Israeli researcher Ailon Aviram made an interesting experiment. Twenty adolescents aged 14-16, who never before learned to compose with the help of computer, were asked to try doing it at home without teacher’s help. They also got necessary educational materials. Half of those who took part in the experiment coped with the task successfully – each of them composed five to ten pieces in different styles. The technical aspect of learning musical and computer art was not a problem; besides, written instructive material was used to the smallest extent [27]. Therefore it is not surprising that composing music with the aid of computer is now popular at schools of many countries and researchers do a lot to develop this learning activity. Still, the quality of these pieces leaves much to be desired, because, as a rule, in most cases they are composed with the help of ready-made “loops” which are included into music constructors. Even if students are asked to make such loops themselves (for instance, by imitating with their own voices some instrumental elements of musical texture, as it was shown during the presentation of Antony Peter Hubmayer, an Australian pedagogue [28]), they are not supposed to fulfill serious artistic tasks, the result of their activity resembles trivial samples of pop-music.

Young people are also fond of such types of computer art as Chiptunes, which implies making arrangement based on low-quality sound of old computer games for kids, or Mushups – making musical collages from popular music [8]. To some extent all types of this practical activity are good for students’ artistic development. Still, it is hard to say that they disclose artistic properties of electronic and computer tools to the full extent and set high standard for the quality of musical production.

In the educational project related to the genre of electronic music which is based on playing upon the sounds of the surrounding world (Soundscape) electronic resources are presented much better [29]. According to the author of the report Jeffery Martin, this genre can be characterized by
reproducing real sounds or synthesizing their analogues – their recognizability is the main principle of such compositions.

This work is very painstaking and often involves transforming real sounds into artificial ones and back, which can be interpreted by the listener as, for example, interplay of dreams and reality or alternation of country and city images. For artistic purposes sound engineering tools, including sound perspective (fixed, moving or variable) are actively used, as well as different types of synthesis (granular, cross, etc.).

However, in spite of delicate approach to the processing of sound details peculiar to this genre of electronic music, and attention to the artistic image, students’ art, as in above-mentioned examples, does not target getting accustomed with “the treasury” of musical art.

As conference materials demonstrate, ICT are extensively used in musical education by many countries. But while various pedagogic projects, which target teaching students traditional music competences, can be considered to be successful, the progress in getting students accustomed to musical creativity with the aid of ICT is not so great. In this sphere new technologies are just beginning to disclose their vast potential. Methods that are used in this sphere can be divided into three groups.

1. Teaching music on the basis of ICT is hardly different from teaching to play mechanical musical instruments. An electronic instrument (e.g. a electronic keyboard or a digital piano) is treated as a substitute of a traditional instrument.

But this attitude is vulnerable. What is the good of an ersatz-instrument if one can chose a real instrument which is certainly of better quality than its electronic copy? – One cannot seriously speak of “ersatz-teaching” in performing music.

2. Students’ musical activity is confined to composing pieces from ready-made models or texture models created by them. This activity is based on music constructors programs, which do not require the user to know musical notation. It is one of the program’s advantages – any kid can learn how to use it easily.

The disadvantage is that such programs do not let the user express his or her individuality in full. Most models included in them are related to pop-music, therefore the product created on their basis, as a rule, is not very meaningful (although it can be quite suitable as background music of a video-clip). But is it correct to confine to the most simplified forms of the musical art while teaching it to students?

3. As an example of students’ musical creativity some or other trend of experimental electro acoustic music is chosen. This approach involves delicate and exquisite work with sound, which – with the aid of modern digital instruments – is quite within the student’s abilities.
However, this aesthetics implies a break-off from the classical tradition, which involves the presence of a composer and a performer in musical activity (although the same principle can be observed in the method which was mentioned above when students’ art is based on models). Classical three-part musical communication (composer – performer – listener) presupposes some valuable properties of products of musical activity, such as accurately studied thematic material and its development, vivid imagery system of the composition and a great number of performers’ individual interpretations, significant content expressed in exquisite form. How full and adequate will the student’s ideas of musical art be, if he or she misses real values of composer’s and performer’s art?

We have come across a paradox. While music technologies have made a big step forward, educational and artistic activity which is based on them either makes no headway (as in the case of treating digital instruments as mere substitutes of mechanical ones), or moves to the distant past when musical communication consisted of two chains – the musician (who, as a rule, was improvising) and the listener; and there was neither composer nor performer. Besides, this activity often existed in its most simplified variants and in most cases it is oriented on pop-music.

Surely, any musical art, including art based on archaic principles, to some extent is good for students’ development – let us take, as an example, Carl Orff’s approach of music for kids. However, digital instruments have little similarity with elementary instruments, besides, ICT use in educational musical and artistic activity is not restricted to the youngest children.

One could ask if low effectiveness of ICT application aimed at developing students’ musical and artistic activity makes teachers distrust these technologies and if this approach curbs development of ICT-based learning activity. (Statements illustrating such approach are given above).

Could this lack of trust be caused by undervaluing artistic potential of digital tools? – The latter, apparently, is perceived by teachers en masse as inferior to traditional instruments in ability to embody folk and classical heritage in the sounding and mark the sounding with one’s own individuality.

Methods of applying ICT in musical education, which have become the most popular in the modern world, do not deal with specific character of digital tools as intended for musical art. The methods’ names themselves demonstrate it: Computer Aided Instruction – CAI (teaching what?) and Computer Aided Learning – CAL (learning what?). (Both methods are described above).

It is assumed, that the subject of teaching is known – knowledge, skills and practices, that were developed for several centuries, and that are necessary for activity in musical sphere. If the task is to teach students traditional musical competencies these methods work well. But one has to
bear in mind that digital technologies open a specter of new tasks in musical art. If we are talking about teaching it, such names look vague and artificial – nobody says: teaching “with the aid of the piano” or “with the aid of the violin”. The correct variant is class piano teaching, class violin teaching and, consequently, class electronic musical instruments teaching.

What are the peculiarities of ICT as a means of getting students acquainted with musical creativity and what are the peculiarities of the new school subject related to such creativity? This question becomes especially significant when it comes to developing educational programs and methodical support for new disciplines – “Electronic keyboard”, “Ensemble of electronic keyboard” and “Computer music studio” – which in 2001 were included into practical training of children’s musical schools, children’s art schools and other Russia’s institutions of supplementary education.

At first the approach to new digital instruments in students’ musical creativity was based on acknowledgement of their big artistic potential. As with other instruments which are being taught in Russian musical and art schools, electronic keyboard and musical computer are supposed, first of all, to introduce school students to the treasury of musical art – mastering folk and classical works, the best examples of modern music of both academic and mass orientation (including pieces written specially for children attending class digital instruments) [30].

However, possibilities of the new instruments give an opportunity to exceed the limits of usual performer’s instruments while working on the artistic interpretation of these pieces. Students perform musical pieces, but also make their electronic arrangements, which imply work on texture, instrumentation, sound engineering and sound synthesis [31]. Thus while digital instruments are universal from the point of view of repertoire, their main peculiarity is the opportunity to originally interpret different music – their users get a wide specter of expressive opportunities which make it possible to work both with the sound and with surrounding virtual electro acoustic space.

The products of this activity are not inferior to and often surpass in quality products created in classes of traditional specializations. It is not something to be surprised at – new technologies have always been the basis for breaks-through in artistic activity. For example, J.S. Bach’s harpsichord pieces became a part of repertoire of pianists’ who managed to enrich their sound in many ways. There is no doubt that these as well as many other works of classical composers will take their worthy place in the repertoire of arrangers/performers on electronic digital instruments.

But it is time to answer the questions that gave incentive to our contemplation: “Is technology a new means of serving traditional goals of musical education, or can it do something different?”

The answer is: both. But if the first seems evident today, the new task of the musical education with the use of ICT can be solved if digital instruments are treated as specific musical
instruments. This task can be formulated as intensive and harmonious development of students’
omusical creative abilities on the basis of widening scope of musical activities with the use of
composition, performance, sound engineering and sound synthesis.

“Is it able to bring real world experience into classroom?” – Comprehensive electronic musical
art makes it possible not merely to get students acquainted with the best examples of folk,
classical and modern music of both academic and mass characters, but also to help them to
understand better inexhaustible aesthetic and ethic experience contained in this music.
The focus on solving these two problems – students’ musical and creative development and
getting them acquainted with the treasuries of world musical art – guaranties the success of
development of new ICT-related subjects in Russian educational establishments.

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