Electronic Musical Instruments in the General Music Education System

Irina B. Gorbunova, Clara B. Davletova and Irina O. Tovpich

Abstract— The article is devoted to the problems connected with the process of learning the art of performing on electronic musical instruments in various musical educational institutions of Russia. In particular, the program "Electronic musical instruments in contemporary music education", which is designed to improve the skills of music teachers of secondary schools, teachers of Children's Schools of Art , Palaces and Houses of Creative Work, Centers of Extracurricular Activities with students and other institutions of the system of additional children's education, is considered. The main purpose of the program is to familiarize teachers with contemporary methods and systems of training, development of electronic musical instruments and digital keyboards.

The need for the introduction of this program has several reasons. First of all, it is the interest of young people to contemporary information technologies and their application, in particular, in the field of electronic and computer music, as well as the need to improve the information and professional competence of teachers-musicians. Learning to play electronic musical instruments acquires a special relevance in the system of general music education at the school of the Digital Age, such an opportunity can also be provided in the system of additional education of students. However, the possibility of studying at EMI is available, at least, under one, but decisive condition – the availability of highly qualified teaching staff. Today, there are not enough specialists in demand in the class of electronic musical instrument, and therefore the teachers need to meet the requirements of contemporary society in connection with the increase in social demand for a higher level of professionalism, it is necessary to carry out a qualitative educational process and learn the new one, including digital technologies in the field of art.

Keywords—arrangement synthesizer, electronic musical instruments, music computer, music computer technologies, music education, information technology in music.

I. INTRODUCTION

The fundamental change in the environment as an information environment has led to the need for changes in the musical and educational process, increasingly using information technology in music (ITM) [1]–[4]. At a certain stage of the development of education there was a very unpleasant situation-part of the teachers owing ITM much weaker than their students. Changes in educational technologies used in the process of teaching music in the contemporary school are positively perceived by students, encourage them to be more actively involved in the educational process.

In musical practice, a new class of musical instruments, which includes electronic musical instruments (EMI) [5]–[7], workstations, music computers (MC) [8]–[10], has become widespread. The instruments built on the basis of digital technologies have significant expressive resources, which open up broad prospects for their application in music education.

II. MUSIC COMPUTER TECHNOLOGIES IN EDUCATION OF TEACHER-MUSICIAN

Complex innovative educational system "Music computer technologies in education of teacher-musician", developed in educational and methodical laboratory "Music computer technologies" of the Herzen State Pedagogical University of Russia (Saint Petersburg) relies on the best traditions of national classical music education, innovative foreign experience and contemporary music computer technologies (MCT) [11]–[14] and develops both musical and information technology education, and the affects of the social aspects of the Informatization process of art education in general. The principles underlying the creation of the methodological system are the basis for formation of a new subject area in music and pedagogical education, the possibility of which is due to the emergence and development of the MCT. Their existence is the foundation for the types of professional activity formed at the present stage, both by musicians working with the MCT (sound engineering, digital recording, sound design, sound production, performance on synthesizers and MIDI instruments, etc.) and by programmers-developers in the field of electronic musical systems [15]– [18].

The methodical system is based on using the MCT, specialized software and a specially organized class, as well as on the implementation of the innovative form and method of group creative form of classes [19], it has been developed, licensed and introduced in educational process of vocational and educational profile Bachelor of Art Education "Music computer technologies", which in 2004 carried out a set of entrants in different regions and educational institutions of Russia. For students studying at music faculties of various universities in Russia, classes are conducted in the following disciplines: "Computer music", "History of electronic music", "Technology and teaching methods (on subjects of profile training: music computer technologies)", "Architectonics of

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sound", "Basics of Studio recording", "Information technology in music", "Technology of musical styles", "Basics of composition, instrumentation and computer arrangement", "Traditional and computer Orchestrating", " Studio recording technology", "Methods and practice of teaching electronic composition and arrangement", "Methods of learning to the playing an electronic musical instrument", "Standard software of professional activity of a musician", "Traditional and electronic instrumentation", "Musical computer", "Basic electronic musical instrument", " Additional musical instrument (electronic)", "Electronic synthesizer", "Electronic ensemble", "Musical-computer workshop", etc.

The Master degree program "Music computer technologies in education" was developed and implemented, which in 2006 carried out a set of entrants in different regions and educational institutions of Russia.

Classes on the program cycle of subjects "Music computer technologies of rehabilitation of people with hearing disabilities", "Music computer technologies of rehabilitation of people with visual disabilities", etc. were developed and conducted for the students of the faculty of correctional pedagogics.

Implementation of the innovative educational system "Music computer technologies" is carried out through the system of additional education: retraining programs advanced training programs and courses.

The following professional retraining programs have been developed:

- "Teaching music subjects using music and computer technologies";

- "Teaching electronic musical instruments";

- "Information technology in music and music education".

On the basis of the offered methodical system in Educational and Methodical Laboratory "Music computer technologies" the following programs of professional development were created:

For teachers of music / music teachers of General education schools and teachers of Children's Music Schools and Children's Schools of Art:

"Music computer technologies", "Methods of teaching musical disciplines with the use of music computer technologies", "Musical creative work with computer", "Methods of teaching electronic musical instruments", "Arrangement of music on electronic musical instruments", "Distance musical education", "Information technology in music", "Music computer — new tool of a musician", "Teaching of musical disciplines with the use of synthesizer and computer in music school, art schools, Information technology in music education", "Music computer in the children's music school", "Sound design", "Applied sound engineering", "Fundamentals of musical programming", "Contemporary methods of teaching musical disciplines, using computer technology", "Methodology of teaching music to people with disabilities (visual, hearing) using musical and computer technology", "Interactive network technologies music learning», "Electronic musical instruments", "Art of performing and arranging on a keyboard synthesizer", etc.

For teachers of music / music teachers of pre-school institutions:

"Innovative methods and technologies of musical development of pre-school children on the basis of music computer technologies".

For students of music schools: a developed elective course for the profile school "Music computer (new instrument of a musician)".

For pupils of comprehensive schools: the program of course training "Introduction to the music computer" is developed.

An elective course "Musical computer — a new instrument for a musician" has been developed and introduced into the educational process for students of profile school. It is a reflection of the training course aimed at developing the creative potential of music students, expanding their musical instruments, familiarity with the applied potential of information technologies in the field of musical art.

Course training programs:

"Intensive course on keyboard instruments (music computer and synthesizer)", "Computer arrangement and composition", "Contemporary recording Studio and work in it", "Making music publications with the computer", etc. Prepared training and educational manuals provide methodological support of the learning process.

III. THE PROGRAM *ELECTRONIC MUSICAL INSTRUMENTS IN CONTEMPORARY MUSIC EDUCATION*

The program "Electronic musical instruments in contemporary music education" is designed to improve the skills of music teachers of secondary schools, teachers of Children's Schools of Art, Palaces and Houses of Creative Work, Centers of Extracurricular Activities with students and other institutions of the system of additional education of children. The program is implemented for professional development of teachers in the direction of "Electronic musical instruments" and "Piano", training teachers of St. Petersburg and Leningrad region, different regions of Russia, teachers from Azerbaijan, Belarus, Estonia, Kazakhstan, Lithuania.

The need for including this program into educational courses has several reasons. First of all, of course, it is the interest of young people in contemporary information technologies and their applications, in particular, in the field of electronic and computer music, as well as the need to improve the information competence of teachers-musicians [20]; [21]. Traditional music education interests many children, but for others it is an attractive alternative - learning to play EMI. This direction becomes especially urgent in the system of general music education at the Digital Age School [22]. And this opportunity can be provided in the system of additional education of students. However, the possibility of studying at EMI is available, at least, under one, but decisive condition – the availability of highly qualified teaching staff. Today there somewhat lack of specialists in demand in the EMI classes, teachers need to meet the requirements of contemporary society

in connection with the increase in social demand for a higher level of professionalism, it is necessary to carry out a qualitative educational process and master new technologies. The main purpose of the program is to acquaint teachers with contemporary methods and systems of training, mastering the capabilities of EMI and digital keyboards. The main tasks solved in the course of professional development of teachers of music and teachers of musical disciplines of various establishments of system of additional education of children, are the following:

* professional development of teaching musicians and music teachers of secondary schools;

* introduction to new technologies and methods of teaching EMI and digital keyboards;

* introduction to technical parameters and performance capabilities for EMI and electronic keyboard instruments;

* practical development of methods of arrangement on EMI, workstations and electronic pianos.

A brief summary of the program:

1) EMI and keyboard synthesizer as an independent discipline of the educational cycle. Instrument design, familiarity, basic principles of keyboard synthesizers. The main functions of the digital keyboard synthesizer and their role in creating a musical image.

2) Performing apparatus. Two variants of execution on EMI-sitting and standing. Specifics of playing conditions and movements of the left hand in the mode of auto maintenance (Single, Finger, Fingered).

3) Features of work with timbre. Multi-timbral possibilities as the main difference EMI from other musical instruments. Classification of voices in the banks. Selecting a timbre for creating an artistic image.

4) Technical parameters of the instrument. The possibility of dividing the keyboard (Split). Auto maintenance panel (Start/Stop, Synchronic Start, Intro, Ending, A, B, C, D). Registration control panel. Effects (delay, chorus, reverb, harmony, Flanger, Phaser, echo, distortion). Buttons Tempo, Mode, Function, etc. work with the drive.

5) The Creation of arrangements in the selection process of the settings tool, on the basis of assigned art tasks.

6) Harmonization of melodies digitally in the mode of auto accompaniment. The concept of "digitalization". A compilation of the letters of the chords.

7) Work at the piece of music.

8) Arrangement for EMI based on simple pieces written for other instruments (piano, guitar, etc.) Work with a multi-track sequencer. Recording mode. The drafting arrangement. Adjustment. Implementation in practice.

9) Visiting seminars. Concert demonstration of the prepared creative works.

Main content of the program

Section 1. Classification of EMI of different companies (CASIO, ROLAND, YAMAHA), their specifications. Demonstration of artistic and performing abilities of synthesizers. Children's concert. Travelling seminars.

Section 2. Contemporary methods and technologies of teaching in music education. Pedagogics creativity in the field of electronic instrument. EMI as an independent discipline of the educational cycle. The device of the tool, the basic principles of operation. Familiarity with the instrument. Demonstration of performance capabilities of the synthesizer.

Section 3. EMI's performing apparatus. Modes of playing the synthesizer Normal, Split. Possibility of dividing the keyboard. The specificity of the performance for the left hand. Musical timbres and the principles of their use. A set of timbres. Multi-timbral possibilities as the main difference between the synthesizer and other instruments. Technical parameters of the instrument. Panel Autotrackings. Modes of Auto Accompaniment. The ability of automatical turn on using the buttons Intro, Start, Synchronic Start. Multi Pad panel (music phrases, patterns, effects). The transforming function of the registration memory Registration memory.

Section 4. Harmonization of melodies in the auto accompaniment mode. The drafting arrangement. Establishing of arrangements in the selection process of the settings tool. Work with a disk drive, floppy disks. Recording modes: fast, multi-track. The term "sequencer". Working with a multi-track sequencer. Recording music on the sequencer (for creating soundtracks). Arrangement (arrangement) for the synthesizer based on pieces written for other instruments, vocal works. Repertoire.

Section 5. Ensemble in the EMI classroom as one of the forms of music training. The ensemble and its role in education (the ability to listen, to adapt to the partner, the ability to communicate, exacerbates the manifestation of creative activity, etc.). Teaching method. Ensemble music making as a part of musical culture (duets, trio of synthesizers, vocal and instrumental ensembles, EMI ensembles with acoustic instruments, vocals, etc.). Arrangement for class EMI and ensemble. The repertoire of the the class EMI teacher.

Section 6. Methods of teaching EMI. Forms, techniques, and methods of the keyboard synthesizer usage in the curriculum in instrumental, choral offices Children's Music Schools and Children's Schools of Art. Practical course. Principles of the approach to the study of musical material when working in Children's Schools of Art , Palaces and Houses of Creative Work, Centers of Extracurricular Activities with students. Presentation of the comprehensive program. Work on children's repertoire.

Section 7. Music computer at EMI's class. Familiarizing the child with the possibilities of recording and editing music on MC in the music editor Steinberg Cubase/Steinberg Nuendo. Making arrangements on a computer using music programs Band-in-a-Box and Steinberg Cubase/Steinberg Nuendo.

Section 8. Round table. Presentation of the students' credit works of the advanced training courses.

Upon completion of the course, teachers should learn and be able to apply the new teaching methods in pedagogical practice; learn about EMI, its technical parameters and basic principles of work.

Educational and methodical seminars, workshops are designed to teach the course listeners:

* ability to apply and test contemporary technologies, methods of teaching and development of students;

• implementation and using of EMI, an introduction of contemporary teenagers to the musical culture;

* laying the groundwork for creative development of students, more complete disclosure of each individual through the development of contemporary learning technologies.

* creation of conditions for professional growth of teachers of additional education, acquaintance with innovative technologies in music education.

IV. CONCLUSION

In the context of the dynamic development of tablet technologies, the education system faces fundamentally new tasks that require new technological solutions and the development of pedagogical conditions for their effective using, the search for relevant approaches to the organization of the educational process in music education. To a large extent, this is due to the teaching of EMI, which are integrated into the field of mobile and cloud-based educational services [23]. High-tech information creative educational environment of music education, built on the use of contemporary learning technologies and MCT, will allow, as outstanding musicologist of the 20th century Yury Rags noted in the article "Prospects for the development of computer science in music schools" " to unite in the interests of musicians working in secondary schools and in special music schools in all specialties and at all levels of education (in school, College or University)" and "to use the rich capabilities of new information technologies in the methodological development of musical education" [24, p. 87].

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She was on a number of business trips abroad, among them working trip to the USA (1999); lecturing and giving research and practice seminars in Hungury (2003, 2005, 2017); business trip to the UK (2016); she was a member of the Jury of national and international competitions of musical creativity, including *Bridge of Friendship* (Dortmund, Germany, 2011), etc. Work experience; 1990 – 2010 - Associate Professor, Professor of the Department of Information Technology of the Herzen State Pedagogical University of Russia, St. Petersburg; 2010 - present - Full Professor of the

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