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Music computer technologies in the perspective of digital humanities, arts, and researches

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Abstract

The article focuses on the active development of the Russian school of performing skills on electronic musical instruments (EMI) as one of the music computer technologies (MCT) forms. As a result, according to a significant part of the teachers surveyed, the use of EMI and MCT in childhood stimulates musical development and the ability to express oneself creatively and a desire to continue musical education. In conclusion, MCT and interactive network educational technologies are an excellent solution to the problems of teaching.

Keywords: Music, Education, High-Tech, Information, Environment.

Tecnologías informáticas de la música en la perspectiva de las humanidades digitales, las artes y las investigaciones

Resumen

El artículo se centra en el desarrollo activo de la escuela rusa de habilidades interpretativas en instrumentos musicales electrónicos (EMI) como una de las formas de tecnologías informáticas de música (MCT). Como resultado, según una parte importante de los maestros encuestados, el uso de EMI y MCT en la infancia estimula el

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desarrollo musical y la capacidad de expresarse creativamente y el deseo de continuar la educación musical. En conclusión, MCT y las tecnologías educativas de redes interactivas son una excelente solución a los problemas de la enseñanza.

Palabras clave: Música, Educación, Alta tecnología, Información, Medio ambiente.

1. INTRODUCTION

At the edge of the 20th and 21st centuries, a new direction in musical creativity and musical pedagogy arose. Thanks to the rapid development of information technologies and electronic musical instruments, a new interdisciplinary sphere of professional activity are related to the creation and use of specialized musical program hardware, requiring knowledge and skills both in the musical field and in computer science - music computer technologies. This concept has been used by specialists in various musical fields since the beginning of the 21st century. Many educational institutions of the world teach the MCT elements to musicians. Among such institutions are the Institute for Research and Coordination of Acoustics and Music (IRCAM) at the J. Pompidou Center in Paris; CEMAMu in Paris, formed by Xenakis; Center for Computer Studies in Music and Acoustics, Stanford University; University of California San Diego Music Experiment Center; MCT Scientific and Educational Center of the Tchaikovsky Moscow State Conservatory and others; musical programming elements are taught to musicians at the University of

Hertfordshire, The University of Salford, Access to Music Ltd., Bedford College in the UK; Institut für Musik und Akustik in Germany; in the branches of the University of California, Stanford University, New York University, Full Sail University, Music Vision International LLC in the USA, etc.

For about twenty years, MCT has been actively introduced in the Russian Federation as a new type of educational and artistic activity of a music teacher. MCT are licensed and thus are implemented in the educational process of higher educational institutions of the country. There are educational programs for Bachelor students in Music computer technologies and for Master students in Music computer technologies in education, which were developed in the Educational and Methodical Laboratory Music computer technologies at the Herzen State Pedagogical University of Russia following the author's articles (CHAO-FERNANDEZ, ROMAN-GARCIA, CHAO-FERNANDEZ, 2017).

A school of performing at EMI is developing as well. Classes on MCT and EMI are opened in music universities, music schools, colleges, schools of art, and other establishments for children's creativity, art education centers for children and youth. Numerous festivals and creative contests are held in cities of the Russian Federation, where students and teachers perform in various genres of digital and electro-acoustic music; contestants' performance is judged by competent judges. The authors note a number of competitions, which are held in St. Petersburg and which have become widely

known in the country and abroad: the annual All-Russian Competition of Electro-Acoustic Music DEMO, the International Competition of Creative Activities the Musical Palette, the All-Russian Festival-Competition KLARINI of the 21st century, etc. The number of contestants is steadily increasing every year; the geography of the contestants is expanding (HORITA, 2014).

2. METHODOLOGY

A high-tech educational information environment requires a search for new approaches and fundamentally new educational systems. Innovative musical pedagogy at the present stage is associated with the use of MCT - a modern and effective means of improving the quality of teaching musical art at all levels of the educational process. MCT is an indispensable tool of the educational process for various social groups in connection with a highly artistic musical culture, as well as a unique technology for implementing an inclusive pedagogical process in teaching people with health limitations (LÓPEZ, 2014).

The introduction of MCT into the educational process makes it possible to actualize new opportunities for the education and further education of highly qualified specialists of various levels in demand in modern society and opens prospects for art education, and musical pedagogy. As a result of solving this problem, the ways of

implementing the concept of music computer pedagogical education are substantiated, which allow for qualitatively changing the level of education of a music teacher at various stages of education, as well as forming the necessary level of their informational competence.

The musical practice demonstrates that a new class of musical instruments has become widespread, which includes keyboard synthesizers, workstations, music computers, etc. The instruments built based on digital technologies are characterized by significant expressive resources, which opens broad prospects for their use in music education (CRAWFORD & SOUTHCOTT, 2017).

A comprehensive innovative educational concept Music computer technology in the education of a music teacher, developed at the Educational and Methodical Laboratory Music computer technologies of the Herzen State Pedagogical University of Russia, under the guidance of the author of the article, draws on the best traditions of Russian classical music education, innovative foreign experience, and modern MCT and develops both music and information technology education proper and affects the social aspects of the process of informatization of art education in general (GORBUNOVA, I.B., ZALIVADNY, M.S., 2018). The principles underlying the creation of the concept are basic for the formation of a new subject area in music and pedagogical education, the possibility of which is related to the emergence and development of MCT. Their existence is the foundation for the types of professional activity that have formed at the present stage, both for musicians working with

MCT, as well as programmers and developers in areas of electronic music systems (WISE, 2016; LIC, 2014; HASSAN et al., 2019).

In the framework of the research, surveying, testing, and interviews were carried out aimed at determining the specifics of using the capabilities of modern MCT and EMI and identifying factors contributing to the development of students' faculty abilities; the project method was used in the preparation and defense of graduate qualifications by students of professional further education programs; a generalization of pedagogical experience was carried out. Surveying and testing were anonymous. The survey involved leading teachers of music schools in Russia, relying on the use of MCT and EMI in their pedagogical and creative practice. The total number of participants was more than 2,000 people (GOH KHEE, 2014).

3. RESULTS

The discussed concept of education of a music teacher is based on the use of MCT, specialized software and a specially organized class, as well as on the implementation of an innovative in form and methodology group creative form of conducting classes. The experimental data of the conducted studies are analyzed, based on the results of surveys of leading teachers of MCT and EMI from various regions of Russia, who are researching under the continuing education and professional further education programs in the Educational and

Methodical Laboratory Music computer technologies of the Herzen State Pedagogical University of Russia, as well as students and undergraduates, the preparation process of which is an effective basis for the developed concept. The results of the research are reflected in the dissertation, conducted under the guidance of the author of the article from 2000 to the present (TRUSH, 2016).

1. A vocational educational profile for the training of **B**achelors of Art in Music computer technologies was developed, licensed, and introduced into the pedagogical process. Since 2004, students have been recruited in various regions and various educational institutions of Russia. The following disciplines are taught students of music faculties of pedagogical universities, classes: Music computer, History of electronic music, Technologies and teaching methods, Architectonics of sound, Fundamentals of studio recording, Information technology in music, Technology of musical styles, Fundamentals of composition, instrumentology, and computer arrangement, Traditional and computer orchestration, Technologies of a recording studio, Methods and practice of teaching electronic composition and arranging, Methods of teaching playing an electronic musical instrument, Standard software for professional activities of musician, Traditional and electronic instrumentology, Music computer, Primary electronic musical instrument, Additional musical instrument, Electronic synthesizer, Electronic ensemble, Music computer workshop, etc.

2. The implementation of the innovative educational concept of music computer pedagogical education is carried out through the system of additional education.

Professional further education programs:

—Teaching the musical disciplines using music computer technologies;

—Teaching electronic musical instruments in educational institutions,

—Information technology in music and music education;

—Technologies for the creation and artistic processing of sound information.

Continuing education programs: For music teachers of secondary schools and teachers of children's music schools and children’s schools of arts: Music computer technologies, Methods of teaching musical disciplines using music computer technologies, Music computer creative activities, Methods of teaching electronic musical instruments, Arrangement of music on electronic musical instruments, Distance musical education, Information technology in music, Music computer art of music, Electronic musical instruments, Information technology in music education, Art of using mastery of skills and arranging on a synthesizer, Sound design, Applied sound engineering, Fundamentals of musical programming, Sound and timbral programming, Modern methods of teaching musical disciplines using music computer technologies, Methods of teaching music to people with disabilities using music computer technologies, Tablet and

mobile technologies in music education, Interactive network technologies for teaching music and others (SOSNEVAS, 2018).

3. The implementation of the concept also provides for the professional development of music teachers and their methodological support on the Internet. A methodological system developed by a team of authors makes communication with music available online for a wide range of students. The methodological system is aimed at creating the foundation of music education both for future professionals and music lovers, through mastering music as a metalanguage, the possession of which allows for listening, understanding, and speaking, that is, have the opportunity to express yourself (HASTINGS, 2018).

4. Inclusive music education: equal opportunities for music education and rehabilitation of children with health limitations. The proposed methodological system is based on the basic properties of human nature to be an active participant in musical activity, including its ability and penchant for playing, on the basic properties of the nature of music, which accumulates the unity of three discrete sensory systems, and on the capabilities of MCT, which have no analogues in the past. Moreover, the absence of one of them, although complicating the path to playing music, makes it possible to compensate for the missing term, which makes it possible to apply this methodological system in inclusive education. Based on the surveys, the following results were obtained:

- Almost 100% of teachers believe that MCT and EMI contribute to the development of students' creative potential. Among the main positive points, the following are noted:

- The use of MCT and EMI in music education contributes to a qualitatively new level of performing skills and the development of creative, composer thinking of students;

- Students eagerly master new musical technologies, get performing skills on a synthesizer, make computer arrangements, compose music, create musical projects in a music computer studio;

- The research of the possibilities of MCT contributes to the development of the artistic and creative potential of students, arouses interest in musical and contemporary audiovisual art;

- Teaching EMI and MCT provides an opportunity to gain new specialties in the widely demanded professional activity of a musician.

More than 50% of the surveyed music teachers noted that classes using MCT and in the EMI class increased the self-esteem of almost all students, formed the need and desire to develop own creative initiatives, create art projects, which correspond to highly artistic aesthetic evaluations. More than 90% of the subjects noted the growing interest of students in secondary and higher musical educational institutions in creative activities using MCT, EMI, and modern digital technologies.

Music computer today is becoming increasingly popular in music education: The number of contests and festivals for young performers is growing, attracting increased participants every year.

Digital technologies are an effective tool for the development of musical and artistic abilities of students, which is associated, first, with the opportunity for their creative expression (DING et al., 2016). Today, there is already thorough creative and pedagogical experience in conducting educational activities using MCT and EMI, a certain thorough level has been reached, which can serve as a potential for the further development of a new educational direction that requires the education of high-level music teachers. A variety of timbre palette, the possibility of sound synthesis, reliance on the best traditions of academic music in combination with modern trends in the development of musical art - so with the help of MCT, a new musical language is formed, a wide scope for creative activity opens. More than 90% of teachers say that:

- Knowledge of MCT is a priority in the modern world;
- A music computer as a tool of modern times is of great interest to a child from early childhood;

Today, the number of students who want to get a musical education in the MCT and EMI classes in the computer studio has increased significantly and sometimes exceeds the number of those who want to get a musical education in other, traditional areas.

According to a significant part of the teachers surveyed, the use of EMI and MCT in childhood stimulates musical development and the ability to express oneself creatively and a desire to continue musical education. Moreover, according to their observations, students'

desire to play on EMI often contributes to interest in the professional development of traditional musical instruments.

Dissertation research, carried out at the Educational and Methodical Laboratory Music computer technologies of the Herzen State Pedagogical University of Russia, making a significant contribution to the development of the developed concept of music and teacher education in Russia, allows for monitoring continuously the situation in the educational process and quickly respond to current trends and make the necessary additions associated with both changes in the educational sphere and related to continuous development and technological improvements to MCT and EMI.

4. CONCLUSION

Methodological developments in using new MCT in the system of contemporary musical education are carried out at the Educational and Methodical Laboratory Music Computer Technologies of the Herzen State Pedagogical University of Russia for about 20 years: vocational further education programs for specialists with higher and secondary vocational education were introduced into the educational process, continuing education programs are being implemented, course education is carried out, a vocational education profile is developed, licensed and implemented in the educational activities of many

Russian universities Bachelors in Music computer technologies, Master's program in Music computer technologies in Education.

The approbation of the concept of music computer teacher education has been conducted for more than 17 years in Russia, and, considering the system of additional professional education, with teachers from Azerbaijan, Armenia, Kazakhstan, Belarus, Ukraine, Estonia, and France. The elements of the concept through the introduction of interactive network technologies for teaching music in collaboration with colleagues from the United States were partially tested in the work of teachers in more than 52 countries of the world, which made it possible to argue that education is based on the use of modern MCT works with any direction in the world of musical teaching. MCT and interactive network educational technologies are an excellent solution to the problems of teaching not only general and special pianos, but also academic solfeggio, the theory of music, harmony, the history of music - and many other disciplines that are an integral part of the education course of the Russian School of Music, its initial, middle and higher levels of education.

The main goal of creating the concept was the idea for universal musical education, without which the cultural development of people is impossible and which determines the direction of development of Russian musical pedagogy. The inclusion in the clavier arrangement program of outstanding works of world classics helps any student to actively join the best examples of world musical art, not only listening,

but also performing them, as is taught in Russia at the music school, and at the music school, and the conservatory.

The process of creative activities in music using MCT, digital musical instruments, an electronic keyboard opens up great prospects for the development of new educational areas within the framework of the socio-cultural paradigm of musical instrument performance and is considered as a dichotomy of traditional and innovative cultural directions. The diachronic analysis of the formation and development of performance on digital musical instruments allows for identifying their role in the modern cultural process, to determine the corresponding functions of a music teacher in the process of preparing and developing a contemporary musician for relevant forms of cultural and socio-cultural activity in a multifunctional high-tech creative and educational environment, which opens up great prospects for the formation and development of new types of professional activities of a contemporary musician.

Music computer education as a new type of educational and artistic activity has the broadest prospects for the development of general, additional, and professional education, and is an effective basis for the educating a music teacher of the Digital Age School. The conclusions of the article allow for outlining the prospects for the development of the concept of music computer pedagogical education as a new type of educational and artistic activities in general, professional, additional, and inclusive education.

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