

ISCKMC 2020**International Scientific Congress «KNOWLEDGE, MAN AND CIVILIZATION»****MODEL OF TRAINING BACHELOR STUDENTS IN MUSIC AND
COMPUTER TECHNOLOGIES**

Anton Andreevich Konovalov (a)*, Natalia Innokentievna Butorina (b),
Aleksij Olegovich Beltyukov (c), Anastasiya Alekseevna Khoroshun (d)

*Corresponding author

(a) Russian State Vocational Pedagogical University, 11, Mashinostroitelej str., Ekaterinburg, Russia,
anton-andreevi4@mail.ru

(b) Russian State Vocational Pedagogical University, 11, Mashinostroitelej str., Ekaterinburg, Russia
nainnrgppu20@gmail.com

(c) Russian State Vocational Pedagogical University, 11, Mashinostroitelej str., Ekaterinburg, Russia Russia,
aleksejbelyukov@yandex.ru

(d) Russian State Vocational Pedagogical University, 11, Mashinostroitelej str., Ekaterinburg, Russia
anastasiya_khoroshun1@mail.ru

Abstract

The paper presents the solution to the problem of developing the content of a model for professional training of bachelor students in music and computer technologies, which is necessary for organization of the educational process to ensure achievement of learning outcomes in higher education. In accordance with the purpose set, the authors identify and characterize the specificity of the educational process based on implementation of the structural and functional model of formation of subject-oriented competencies in the field of music and computer technologies in bachelor students with the leading role of educational music and computer activities. The created model highlights and describes in detail the motivational-target, content-logical, activity and technological and diagnostic (assessment) blocks required for successful formation of the considered competencies. The content of competence-based, activity-based, personality-oriented and technological approaches and the principles of training in a higher educational institution that make the basis for the content and methods of model implementation are revealed. The content of subject-oriented competencies in the considered field of training is proposed, three stages of their formation in bachelor students in classes of music and computer disciplines are schematically presented. A complex of pedagogical technologies, the main forms of training organization and the means of subject-oriented competence formation in classes of subject-oriented disciplines are presented. In conclusion, the authors reveal the specificity of the educational process during implementation of the developed structural and functional model of professional training of bachelor students in the field of music and computer technologies.

2357-1330 © 2021 Published by EuropeanPublisher.

Keywords: Pedagogical education, model of training bachelor students, music and computer technologies, subject-oriented competencies, music and computer activities



This is an Open Access article distributed under the terms of the Creative Commons Attribution-Noncommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

Current changes in society, in particular, new demands of the rapidly changing labor market, dictate the requirements for a graduate of a higher education institution as a person who is in line with global trends. These requirements, enumerated in the Federal State Educational Standards, are associated, first of all, with implementation of the competence-based approach, which has replaced the knowledge paradigm, and implies complex training of specialists who possess not only knowledge, skills and abilities, but also practical experience of their effective application in professional activities.

One of the current methods to achieve successful results in vocational training is the use of a special educational model, which is especially relevant in training of bachelor students in subject-oriented academic disciplines in music and computer technologies. This is due to insufficient theoretical substantiation and practical absence of this type of the model based on innovative music and computer activities of students.

2. Problem Statement

The problem raised by the authors is the need to develop the content of a model for training bachelors in music and computer technologies for the educational process to ensure successful learning outcomes that meet the modern requirements of society and the economy as a whole.

3. Research Questions

The subject of the study is related to development of the content of the model for training bachelors in the field of music and computer technologies, identification of the specificity of its implementation in the educational process during formation of subject-oriented competencies of students in music and computer activities in classes of subject-oriented disciplines, and it requires clarification of a number of concepts.

In professional training of the bachelor in direction 44.03.01 Pedagogical education, the profile Music and computer technologies, the educational outcomes are universal, professional and subject-oriented competences (hereinafter referred to as SOC).

Universal competences as a set of knowledge, skills and elements of cultural experience are formed in students during studying the entire cycle of academic disciplines and practices and allow them to freely navigate and operate with elements of the socio-cultural environment.

Professional competencies are associated with a specific professional activity and represent skills, techniques and methods typical of a specific subject area of professional activity.

SOC in the field of musical and computer technologies is a complex of musical and theoretical, and information knowledge formed on their basis, the skills and abilities of students in creating and processing musical and artistic material in digital form, and a motivated ability of their application in music and computer activity developed based on personal experience and emotional-volitional qualities (Butorina & Konovalov, 2018).

Gonchar (2014), Kuzina (2010) and other researchers unambiguously highlight the need to develop a special training model to ensure the greatest efficiency of professional competence formation, including SOC.

The developed and substantiated teaching models imply formation: of the entire SOC complex (Gonchar, 2014; Kuzina, 2010; Papulovskaya, 2009; Sadulaeva, 2016; Tarasyuk, 2013); of one subject-oriented competence within a cycle of disciplines (Udalova, 2006); of a SOC complex in one of the subject-oriented disciplines (Guzanov et al., 2016; Tuulike & Äli, 2014) of a SOC complex in university practice classes (Nezhinskaya, 2014).

4. Purpose of the Study

The purpose of the study is to describe the specificity of the educational process based on implementation of the structural and functional model of formation of professional and specialized competencies in the field of music and computer technologies in bachelor students with the leading role of educational music and computer activities.

5. Research Methods

The study employed the following methods: statement of the research problem; analysis of domestic and foreign scientific and scientific and methodological sources; modeling; summarizing the results.

6. Findings

The created structural and functional model for training bachelors in the field of music and computer technologies (hereinafter referred to as MCT) contains motivational-targeted, conceptual and logical, activity- technological, and diagnostic (assessment) blocks. To identify the specificity of the implementation of this model, the named blocks are described.

The *motivational-targeted* block reveals the goal, objectives, main approaches and principles of professional training of bachelor students in the field of MCT.

The *purpose* of the model – formation of SOC in the field of MCT in students in classes of subject-oriented disciplines – is achieved through the solution of the following main *issues*:

- 1) clarification of the content and methods of formation of the considered SOC required for bachelors in musical creativity and pedagogical work;
- 2) formation of students' positive motivation and professional need for implementation of musical and computer activities;
- 3) development of the ability to independently solve musical and creative tasks with regard to personal interests and preferences.

The content and implementation of the model are based on competence-based, activity-based, personality-oriented and technological approaches.

The need to apply a *competency-based* approach is determined by the results of subject-oriented training, which in this model are the SOC in the MCT formed in bachelors. This approach considers gaining experience of independent problem solving as the main path of modern education (Lebedev, 2004), it provides movement from orientation towards reproducing knowledge to its application and organization (Bidenko, 2017), and it focuses on student's ability to solve life and professional problems (Bolotov & Serikov, 2003).

Focus on student activities improves the quality of education during implementation of three main forms of education – independent work, educational process, and project activities. In this regard, the competence-based approach should be integrated with the *activity-based* one developed by psychologists A.N. Leontiev and S.L. Rubinstein. The basic thesis of this approach (it is not consciousness that determines activity, but activity determines consciousness) was developed by K.M. Durai-Novakova, N.V. Kuzmina, L.N. Lesokhina, D.L. Slastenin and others, who assert that personality forms and is manifested in activity (as cited in Albrecht, 2008).

Technological approach in education involves the use of pedagogical technologies for optimal construction and implementation of didactic goals with their guaranteed achievement (V.P. Bespalko, A.A. Verbitsky, V.I. Pisarenko, E.S. Polat, V.A. Slastenin, N.E. Erganova and others). It helps to manage the pedagogical process and determine its results, to provide favorable conditions for personality development, to rationally use teaching tools and resources from the teacher's arsenal, to choose and, if required, develop new pedagogical technologies in educational activities (Vishnevskaya, 2008). The importance and effectiveness of the use of pedagogical technologies, including computer technologies, in education are proved by the results of the study conducted by Chen et al. (2020), and approbation of games as a form of learning in music education by Eugenia et al. (2013). Foreign authors note the dynamic effect of gaming technologies, since games, primarily computer-based narrative games, increase attendance, motivation and student engagement in the educational process.

Personality-oriented approach is associated with the concentration of teacher's attention on the integral personality, development of his intellect, responsibility and the spiritual component of the personality with its emotional, aesthetic, and creative inclinations and development potential, which is important in the formation of SOC in bachelor students in the field of MCT (Wnifried, 2013).

The basic *principles* of the model of professional training in subject-oriented disciplines are as follows: scientific; the connection between theory and practice; systematicity and consistency in training of future specialists; consciousness, activity and independence of students in their studies; individual search for knowledge combined with educational teamwork (S.I. Zinoviev); professional orientation (A.V. Barabanshchikov) (as cited in Bulanova-Toporkova, 2002).

Conceptual-logical block of the model offers three stages of formation in classes of music and computer disciplines of four SOC, which include: the ability to apply musical-theoretical knowledge, principles of composition and shaping in the field of MCD (SOC-8); the ability to create compositions using MCT, apply various methods of processing musical material, select and arrange background music elements (SOC-9); the ability to develop and apply multimedia visual and didactic material (SOC-10) in music education; the ability to create with the help of MCT author's creative projects and products in the field of music and art education, culture and art (SOC-11).

The presented SOC in the field of MCT are formed in bachelor students within three consecutive stages.

The first stage is related to formation of SOC (their descriptors) in the field of MCT (SOC-9, SOC-10, SOC-11) in disciplines *Computer Music* and *Information Technology in Music*.

The second stage implies logical continuation of the formation of SOC in disciplines *Fundamentals of composition and computer arrangement* (SOC-8, SOC-9, SOC-11), *Electromusical instrument* (SOC-9), *Music and computer practice* (SOC-11) and *Musical acoustics* (SOC-8).

The third stage is completion of the formation of SOC in the field of MCT in disciplines *Fundamentals of studio recording* (SOC-9, SOC-11), *Fundamentals of concert sound engineering* (SOC-9) and *Theory and practice of computer music* (SOC-8, SOC-9, SOC-11).

The considered disciplines are of special importance for professional training of bachelor students and are primarily determined by the following factors:

- comprehensive integration of the advances of pedagogical science, classical music art and MCT in classes of these disciplines;
- implementation of the main MCD during the formation of SOC descriptors in the field of MCT.

In addition, there is a close relationship and continuity between all music and computer disciplines, which ensure the purposefulness and consistency of SOC formation in the field of study (Fig. 1).

In addition, students' mastering of the content of music and computer disciplines is anticipated and accompanied by music-theoretical (1–8 semesters) and music-performing (1–6 semesters) academic disciplines. In the senior courses, the musical and computer content of education is supplemented with musical and pedagogical disciplines taught in 3–8 semesters (History and theory of music education, Modern technologies of music education, Philosophy and technologies of art pedagogy) and research academic disciplines taught in 4–8 semesters (Research work of students, Methodology of music and pedagogical education, Methodology of art education), which allows implementation of the pedagogical and scientific component of training bachelor students in the field of MCT.

Finally, the formed SOC are integrated in all subject-oriented activities (music-theoretical, music-performing, music-computer, music-pedagogical and research) when students participate in cultural and educational, pedagogical and pre-graduation practical training, as well as prepare and defend the graduate qualification work.

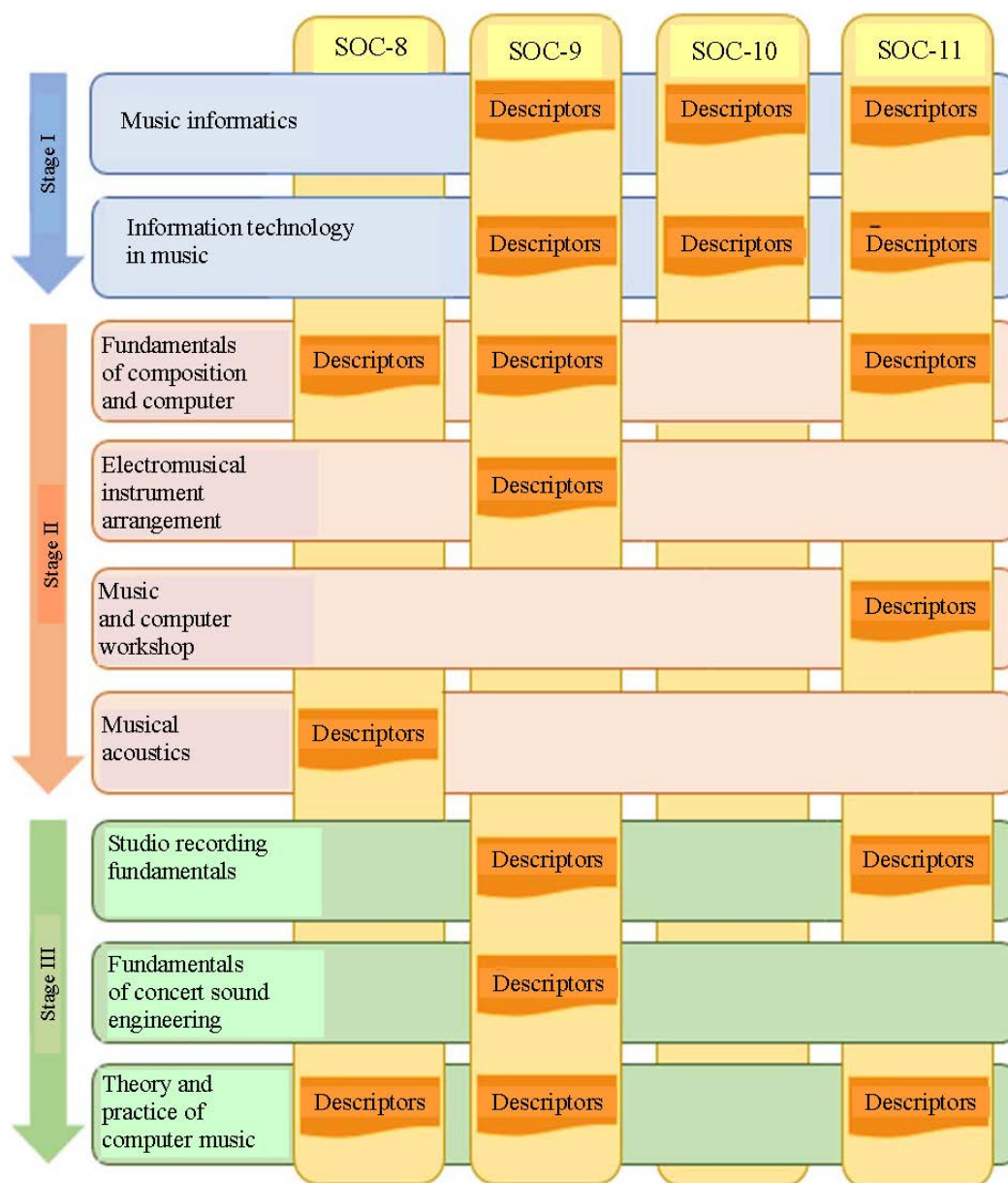


Figure 1. SOC in the field of MCT and the corresponding stages of training and the studied disciplines

The activity and technological block of the model is a complex of pedagogical technologies, the main forms of organization of training, means of SOC formation, including complexes of practical (current, control and final) tasks for the core disciplines.

The complex of *pedagogical technologies* includes:

- *interactive* (work in small groups, business games, modeling), *project* (practice-oriented projects, independent creative projects) and *research* (search, processing and presenting educational information) technologies;
- technologies of *individualization* of training (electronic presentations, lecture notes);
- *information and computer technologies* (preparing and transmitting information to a student using a computer interface, computer sound synthesis, music audio files, creating and editing artistic musical material using music and computer programs) (Fig. 2).

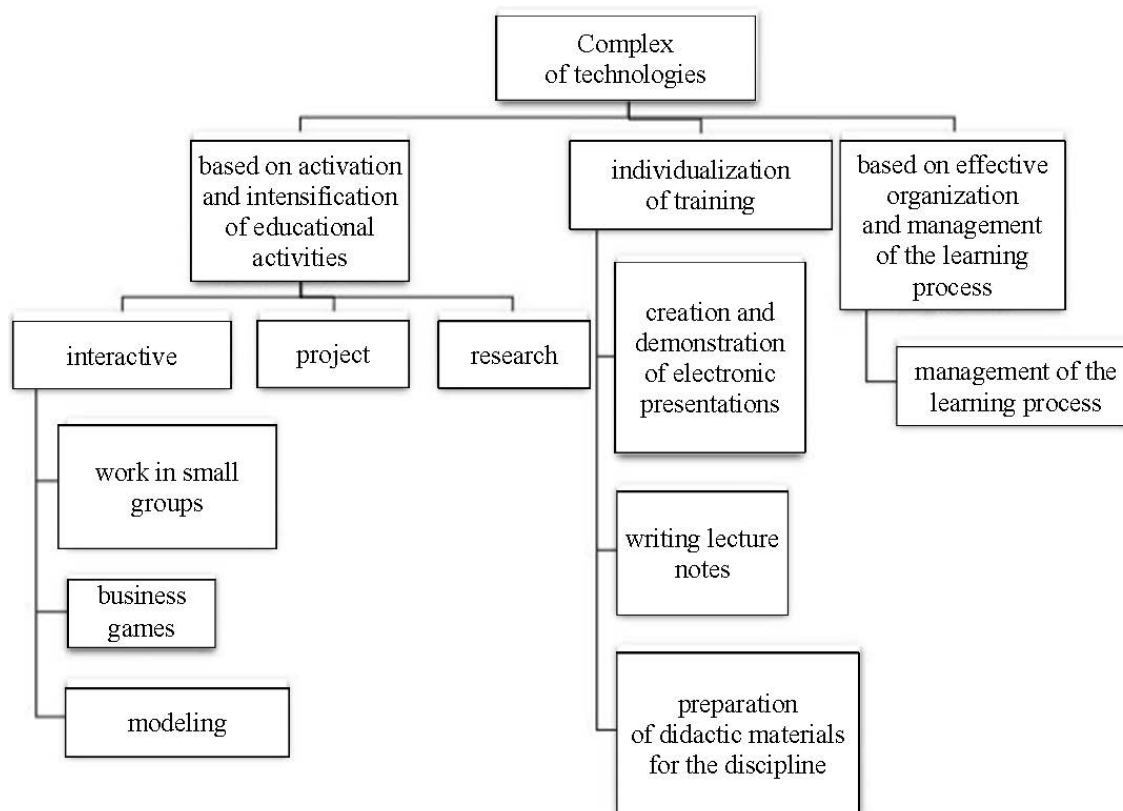


Figure 2. SOC in the field of MCT and the corresponding stages of training and the studied disciplines

The studies by foreign scientists were reviewed to choose the means of SOC formation in students. In particular, Hatice (2013) points out the need to use such educational and musical technical means as reflection devices; devices used to record and play video and audio; devices used in music education; computer software.

The pedagogical technologies proposed for the model are realized through the implementation of sets of practical tasks (current, control and final) developed for classes of all core disciplines in the field of MCT at all stages of SOC formation.

The main forms of training employed in the model are: collective, group, and individual lessons; group and individual tutorials; seminars and scientific and practical conferences; master classes and independent work of students.

The means for forming SOC in the field of MCT include: FSES HE, academic programs, teaching materials, including work programs and assessment tools for core disciplines; current practical, control and final tasks in MCD; computer software and special equipment (electronic, sound and video).

The leading activity in the formation of SOC in the field of MCT is the musical and computer activity of bachelor students, which is an active process of creating and processing musical and artistic material in digital format, as well as reproduction (performance) of music using electronic resources (Konovalov & Butorina, 2018).

The diagnostic (assessment) block of the model contains diagnostic techniques, developed criteria (indicators) and levels (insufficient, sufficient, advanced) for assessing the formation of SOC in the field

of MCT, as well as final control tasks to assess these levels in bachelor students in classes in music and computer disciplines.

The model is developed for successful formation of SOC's in bachelor students in classes of the core disciplines in the field of MCT.

7. Conclusion

Thus, the specificity of the educational process during implementation of the developed structural and functional model of professional training of bachelors in the field of MCT is as follows:

- during the implementation of the model, a complex of SOC's is formed in students, which is due to the unity of educational goals and results of professional training, the close relationship of the core disciplines, the sequence and consistency of the process of the content realization;
- the educational process in the presented model is based on modern *approaches* (competence, activity, technological and personality-oriented) and *principles* of higher education;
- the educational process is carried out in accordance with four sequential *blocks*: motivational-targeted, content-logical, activity and technological and diagnostic (assessment);
- the basic educational activity in the model implementation is the musical and computer activity as a key factor in the formation of SOC's in bachelor students, the main method and result of professional training in the field of MCT, the center of the activity and technological block of the model;
- the educational process based on the implementation of the presented model is of an integral interdisciplinary nature, with regard to the unity of the content and methodological aspects of training;
- the stage-by-stage formation of SOC's is carried out sequentially in classes of all core disciplines in the field of MCT in accordance with the results of professional training (SOC's and their descriptors);
- the proposed complex of pedagogical technologies is implemented in educational practice through the performance of specially developed practical tasks by students using computer technologies individually or in groups;
- the developed model reveals the methodological and technological aspect of the activities of teachers who manage the educational process and students who efficiently and independently master the educational material through the implementation of a set of practical tasks;
- the use of diagnostic methods, specially developed criteria and levels of SOC's formation in the field of MCT, to assess the effectiveness of professional training of bachelor students.

Successful testing of the considered model of training bachelor students in the field of music and computer technologies will make it possible to adapt and introduce the model into the educational process of students of other programs (master's degree, postgraduate degree) in this field of MCT and related creative specialties.

References

- Albrecht, N. V. (2008). *Activity-oriented foreign language teaching of students of a professional pedagogical university. Monograph*. Publ. house RGPPU.
- Bidenko, V. I. (2017). Competencies in vocational education (for the development of a competency-based approach). *Higher Ed. in Russ.*, 11, 67.
- Bolotov, V. A., & Serikov, V. V. (2003). Competence model: from idea to educational program. *Pedag.*, 10, 8–14.
- Bulanova-Toporkova, M. V. (2002). *Pedagogy and Psychology of Higher Education*. Phoenix.
- Butorina, N. I., & Konovalov, A. A. (2018). The content of professional and specialized competencies of students in the field of music and computer technologies. *Higher ed. today*, 5, 52–56.
- Chen, X., Zou, D., Cheng, G., & Xie, H. (2020). Detecting latent topics and trends in educational technologies over four decades using structural topic modeling A retrospective of all volumes of *Computers & Education*. *Computers & Education*, 151, 103855. <https://doi.org/10.1016/j.compedu.2020.103855>
- Eugenia, M. W. N., Raymond, T. M., & Yuen, W. N. L. (2013). Ready for 21st-century education – pre-service music teachers embracing ict to foster student-centered learning. *Proc. – Soc. and Behavioral Sci.*, 73, 240–245.
- Gonchar, E. A. (2014). Special professional training of future teachers of geography: from concept to educational technologies. *Pedag. J. of Bashkortostan*, 2(51), 90–100.
- Guzanov, B. N., Tarasyuk, O. V., & Bashkova, S. A. (2016). Development of profile-specialized competences in the process of industry-specific training of students of a professional pedagogical university. *Europ. Soc. Sci. J.*, 2, 239–245.
- Hatice, S. T. (2013). A comparative analysis of conservatories and departments of music education in terms of the place of technology use in their music education. *Proc. – Soc. and Behavioral Sci.*, 106, 45–54.
- Konovalov, A. A., & Butorina, N. I. (2018). Musical-computer activity as a new type of educational musical activity. In *Continuing education: theory and practice of implementation. Proc. of the Int. Sci. and Pract. Conf. 2018* (pp. 212–215). FGAOU VO RGPPU.
- Kuzina, E. A. (2010). The essence and structure of the special competence of a teacher of vocational training in the field of design. *Bull. of Chuvash State Pedag. Univer. named after Yakovlev*, 3-1(67), 92–99.
- Lebedev, O. E. (2004). Competence-based approach in education. *School Technol.*, 5, 3–12.
- Nezhinskaya, T. A. (2014). Formation of special professional competencies of students in the field of music and computer activities from the perspective of theory and technology of contextual learning. *Pedag. of Art*, 2, 60–65.
- Papulovskaya, N. V. (2009). The model of teaching the academic discipline: didactic aspect. *Ed. and Sci.*, 11(68), 96–103.
- Sadulaeva, B. S. (2016). Information and educational environment as a factor in increasing the efficiency of management of educational institutions. *Society: Sociol., Psychol., Pedag.*, 2, 125–127.
- Tarasyuk, O. V. (2013). A model for the development of profile-specialized competencies of teachers of vocational training in the process of studying the discipline Devices and automata for control of accuracy and quality. *Bull. of Ed. and Methodol. Associat. for Professional and Pedag. Ed.*, 1, 61–72.
- Tuulike, K., & Äli, L. (2014). A Model for Supporting Students' Reflection in Tertiary Music Education. *Proc. – Soc. and Behavioral Sci.*, 112, 199–208.
- Udalova, T. Yu. (2006). Training of psychologists for professional activity using information technologies. *Psychopedag. in Law Enforcement*, 3(27), 138–140.
- Vishnevskaya, G. V. (2008). Technological approach in the pedagogical process of a higher professional school. *Bull. of PSU*, 10, 239–243.
- Wnifried, S. (2013). Self-determination and Music Education in Technological Cultures. *Proc. – Soc. and Behavioral Sci.*, 82, 330–337.