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TRAINING FUTURE TEACHERS OF MUSIC AND OF THE INTEGRATED COURSE "ART" TO CREATE ORIGINAL EDUCATIONAL MEDIA PRODUCTS

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SUMMARY. The study aimed to identify the impact of the experimental model of training future teachers of music and of the integrated course "Art" on their level of competence in creating educational media products. The study uses a set of theoretical and empirical research methods typical of the education sector. Theoretical: analysis and generalization of theoretical sources and modern international experience in distance learning and digital technologies for its organization, particularly in the field of music and arts education in general, as well as theoretical modelling; empirical: pedagogical observation, questionnaires, comparative analysis of test results before and after the implementation of the experimental model of training future teachers, expert evaluation of the quality of media products created by students, as well as the method of reflective self-analysis. Within the framework of the

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study, an author's model for developing the competence of future teachers of music and of the integrated subject "Art" in creating educational media products was developed and tested. The proposed experimental model for teaching the creation of original didactic media products is a comprehensive pedagogical tool that ensures the systematic formation of professionally essential competencies in future teachers of music and of the integrated course "Art". interdisciplinarity and a personal and professional focus in teaching. Prospects for further research include refining the criteria for evaluating educational media products, developing a typology of integrated artistic media formats, and examining their impact on student motivation in school courses for musical arts and the integrated course "Art".

Keywords: media product; media education; competence; music and pedagogical education; multimedia technologies; reflective approach

1. Introduction

The educational space of the 21st century is undergoing rapid transformations caused by the dynamic development of digital technologies, which significantly change both the content of professional training of teaching staff and the very logic of the organization of the educational process.[6] These changes are particularly relevant in the field of school art education, where the combination of traditional art forms with new multimedia tools opens up qualitatively new opportunities for pedagogical activity. At the same time, there is a need to develop in future teachers not only a high level of musical and general artistic competence, but also the ability to conceptually, didactically and technologically comprehend educational content from the perspective of the modern media environment.[7] In this context, special attention should be paid to the problem of developing students' ability to create educational media products that integrate artistic, didactic and communicative functions. It requires not only technical mastery of digital design tools, but also a deep understanding of the specifics of the creative influence of artistic texts in the media format, the ability to purposefully transform complex musical meanings

[6] Merrick, Bradley, Joseph, Dawn. "ICT and Music Technology during COVID-19: Australian Music Educator Perspectives." In *Research Studies in Music Education*, 45(1), 2022, pp. 189–210. https://doi.org/10.1177/1321103X221092927

[7] Levit, D., Ievtukhova, T. "Training Course "Media Literacy" as a Mean for Developing Media Competence of Prospective Vocalists." In *Innovative Pedagogy*, 2(48), 2022, pp. 138–144. https://elibrary.kubg.edu.ua/id/eprint/41724/1/D_Lievit_T_Ievtuhova_INP48T2_IM.pdf

into visual and audio images that are accessible to students, as well as the skills of critical analysis and evaluation of the pedagogical effectiveness of the created product.[8]

The ability to create their own media products for Ukrainian teachers of music and of the integrated course “Art” is critically important, because since the quarantine restrictions related to the COVID-19 pandemic and in the current conditions of martial law, the educational process in both general secondary education institutions and higher pedagogical education institutions is carried out mainly in a mixed format, if not exclusively online, depending on the region.[9]

Against the backdrop of existing research, which mainly focuses on the use of digital resources as an auxiliary tool in teaching art disciplines, the task arises to create a comprehensive methodological model focused on the independent creative activity of students – future teachers.[10] This approach allows for the development of not only digital creativity but also pedagogical thinking based on the interaction of artistic experience and educational reflection. This study aimed to examine the impact of the author’s model of professional training for students of art and pedagogy specialties on the development of their competence in creating educational media products. The following tasks were performed in the course of the study:

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[8] Çetin, Ekmel. “Digital Storytelling in Teacher Education and its Effect on the Digital Literacy of Pre-Service Teachers.” In *Thinking Skills and Creativity*, *39*, 2021, 100760. https://doi.org/10.1016/j.tsc.2020.100760

[9] Yalovskyi, Pavlo, Lotsman, Ruslana, Yurieva, Kateryna, Parfentieva, Iryna, Sokolova, Alla. “Alternative Ways of Organizing Distance Practical Classes for Future Music Art Teachers.” In *Amazonia Investiga*, 12(61), 2023, pp. 276-286. https://doi.org/10.34069/AI/2023.61.01.28; Shlenova, Maryna, Konoplenko, Nataliia, Yuryeva, Kateryna, Korneiko, Yuliia, Hlukhovska, Maryna. “Comparative Analysis of the Distance Learning Implementation in Ukrainian System of Higher Education during the COVID-19 Pandemic and Martial Law.” In *Interactive Learning Environments*, 32(9), 2023, pp. 4968–4977. https://doi.org/10.1080/10494820.2023.2207196; Tkachenko, Maryna, Sokolova, Alla, Yuryeva, Kateryna. “The Muses do not Fall Silent! (Art in times of war).” In *Education, Research, Practice,* 5, 2024, pp. 429–439. https://doi.org/10.52340/erp.2024.05.45; Vasilyeva, Oksana. “Qualification Exam in Choir Conducting: Distance Format.” In: *Choral Creativity and Education: Understanding Traditions, Mastering Innovations*. Helvetica, 2023, pp. 14–18. https://drive.google.com/file/d/1K_aKZGzhbIW_1ztHFf5eFGned5d-TP8g/view

[10] Bohak, Adam, Tina, Metljak, Mira. “Experiences in Distance Education and Practical Use of ICT during the COVID-19 Epidemic of Slovenian Primary School Music Teachers with Different Professional Experiences.” In *Social Sciences & Humanities Open*, 5(1), 2022, 100246. https://doi.org/10.1016/j.ssaho.2021.100246; Park, Hyejin, Kim, Han S., Park, Han W. “A Scientometric Study of Digital Literacy, ICT Literacy, Information Literacy, and Media Literacy.” In *Journal of Data and Information Science*, 6(2), 2021, pp. 116–138. https://doi.org/10.2478/jdis-2021-0001

1. The specifics and pedagogical potential of the author's educational media products in the context of teaching music and the integrated course "Art" in general secondary education institutions have been determined.

2. A structural and functional model for developing students' competence in creating original educational media products has been developed.

3. An experimental verification of the effectiveness of the proposed model in the educational process of higher pedagogical education institutions was conducted.

4. Changes in the levels of competence of future teachers of music and of the integrated course "Art" in the creation of original educational media products were analyzed, which manifested themselves in the emergence of a range of knowledge, skills and professionally significant personal qualities in students, which together form the competence under study.

2. Literature Review

The integration of media education into the training system for future teachers of arts disciplines is considered in contemporary scientific discourse not only as the development of digital competencies, but also as the formation of the ability to design educational content independently. In particular, a study by Shablii emphasizes that the effectiveness of video content depends not only on technical quality, but also on pedagogical relevance: when creating educational media products, it is important to consider the learning objectives, the logic of the presentation of the material, the duration and the visual dynamics.[11] In their study, Castillo et al. described the complete cycle of creating educational videos for biology education, from the planning stage to post-production and content distribution.[12]

In turn, Zimmer and Matthews studied the effectiveness of virtual coaching in increasing the digital awareness of educators, which, in the context of arts and teacher education, can serve as a basis for developing one's own multimedia resources.[13] In contrast, Partti et al. emphasize that

[11] Shablii, Liubov M. "Creation of Educational Videos and Their Use.: In: *Actual Problems in the Education System: Secondary School – Pre-University Training – Higher Education Institution*. National Aviation University, Kyiv, 2021, pp. 247–249. https://doi.org/10.18372/2786-5487.1.15879

[12] Castillo, Stephanie, Calvetti, Karisa, Shoup, Jeffery, Rice, Madison, Labbok, Helen & Oliver, Kendra H. "Production Processes for Creating Educational Videos." In *CBE—Life Sciences Education*, 20(2), 2021, Article es7. https://doi.org/10.1187/cbe.20-06-0120

[13] Zimmer, Wendi K., Matthews, Sharon D. "A Virtual Coaching Model of Professional Development to Increase Teachers' Digital Learning Competencies." In *Teaching and Teacher Education*, 109, 2022, 103544. https://doi.org/10.1016/j.tate.2021.103544

the development of digital competence involves not only the instrumental mastery of techniques but also critical reflection on their application in the educational process.[14] This reflective approach is key to creating original media products that meet both content and methodological requirements. Almazroa and Alotaibi emphasize the need to move away from traditional training models, which are limited to technical skills, in favor of innovative practices, in particular, the media creativity of teachers.[15] In this context, creating one's own educational products is seen as a sign of methodological independence for future teachers. Research by Bannerman and O'Leary confirmed that the actual level of students' readiness for such activities often does not meet the stated expectations, which requires updating the content of professional training with an emphasis on the practical aspects of creating digital educational content.[16]

In their work, Khairunnisa et al. explored how various digital interaction strategies – both inside and outside the classroom – contribute to the development of students' oral speaking skills, proving that free production of digital content – such as creating videos or blogging – has significant potential for deepening language skills.[17] In turn, Ma et al. proposed a multidimensional approach to the formation of digital competence, which integrates technological, pedagogical, and ethical components.[18] Particular attention is paid to the pedagogical application of digital tools in arts education, which involves critically reflecting on their impact on the learning process.

Multimodal media products not only expand traditional forms of learning but also stimulate students' creative and critical abilities, promoting

[14] Partti, Heidi, Weber, Julia, & Rolle, Christian. "To Master a Skill or to Learn? Supporting Music Educators' Professional Development in Technology Integration." In *Journal of Music, Technology & Education*, 14(2–3), 2021, pp. 123–139. https://doi.org/10.1386/jmte_00037_1

[15] Almazroa, Hiya, Alotaibi, Wadha. "Teaching 21st-Century Skills: Understanding the Depth and Breadth of Challenges for Designing Proactive Teacher Education Programs." In *Sustainability*, 15(9), 2023, 7365. https://doi.org/10.3390/su15097365

[16] Bannerman, Julie K., O'Leary, Emmett J. "Digital Natives Unplugged: Challenging Assumptions of Preservice Music Educators' Technological Skills." In *Journal of Music Teacher Education*, 30(2), 2020, pp. 10–23. https://doi.org/10.1177/1057083720951462 (Original work published 2021)

[17] Khairunnisa, Nor Amalia, Rahman, Muhammad A., Handrianto, Ciptro. "English Digital Literacy Practices Inside and Outside Class to Develop Students' Speaking Skills." In *Journal of English Language Teaching*, 10(1), 2023, pp. 13-24. http://dx.doi.org/10.32332/joelt.v10i1.3790

[18] Ma, Na, Lee, Sze S. J., Md Noor, Harrinni, Fu, Jia Q., & Wang, Ying. "A Pre-Service Art Teacher Digital Literacy Framework for Digital Literacy in Pre-Service Art Teacher Education in China." In *Asian Journal of University Education*, 20(2), 2024, pp. 235–247. https://ir.uitm.edu.my/id/eprint/111488

a deeper understanding of the learning material. Olsen came to the same conclusions.[19] The author studied the impact of multimodal cognition and a holistic approach on the transformation of educational practices through media art. In turn, Lähdesmäki, et al. focused on how the integration of different modalities – visual, auditory, textual, and bodily – contributes to the formation of a comprehensive understanding of cultural meanings and students' communication skills.[20] In their study, Raptis et al. investigated multimodal interactions aimed at improving the understanding of artistic contexts using modern methods of artificial intelligence and human-computer interaction.[21] Similarly, Bezemchuk, et al. examined the characteristics of engaging music education students in distance learning through online courses.[22] The authors emphasize the importance of using digital tools to support the learning process in distance education, taking into account the specifics of music pedagogy. In their study, Chen and Xiong examined innovative methods for optimizing multimedia visual representations in music pedagogy aimed at improving the effectiveness of the learning process.[23]

Particularly relevant for the training of future teachers of music and of the integrated course "Art" is the emphasis on creating conditions for creativity, critical thinking, and media literacy.[24] Similarly, in their study, Huralna et al. highlighted various technical tools and software products that contribute to improving the quality of the educational process.[25] In their work, Björklund

[19] Olsen, Dain. *Media Arts Education: Transforming Education through Multimodal Cognition, Holistic Learning, and Techno-Embodiment* (1st ed.). Routledge, New York, 2024. https://doi.org/10.4324/9781003430834

[20] Lähdesmäki, Tuuli, Baranova, Jūratė, Ylönen, Susanne C., Koistinen, Aino-Kaiso, Mäkinen, Katja, Juškiene, Vaiva, & Zaleskiene, Irena. (Eds.). *Learning Cultural Literacy through Creative Practices in Schools: Cultural and Multimodal Approaches to Meaning-Making*. Springer Nature, Cham, 2021. https://doi.org/10.1007/978-3-030-89236-4

[21] Raptis, George E., Kavvetsos, Giannis, Katsini, Christina. "MuMIA: Multimodal Interactions for Better Understanding of Artistic Contexts." In *Applied Sciences*, 11(6), 2021, 2695. https://doi.org/10.3390/app11062695

[22] Bezemchuk, Larysa, Sokolova, Alla, Binitska, Kateryna. "Engagement of Music Pedagogy Faculty Students in an Online Course." In *Review of Contemporary Higher Education*, 8, 2023, pp. 91-103. https://doi.org/10.28925/2617-5266.2023.86

[23] Chen, Mengmeng, Xiong, Chuixiang. "New Methods for Improving Optimization of Multimedia Visual Representations in Music Pedagogy." In *Technical Sciences*, 40(5), 2023, pp. 2131–2138. https://doi.org/10.18280/ts.400530

[24] Levit, D., Ievtukhova, T. "Training Course "Media Literacy" as a Mean for Developing Media Competence of Prospective Vocalists." In *Innovative Pedagogy*, 2(48), 2022, pp. 138–144. https://elibrary.kubg.edu.ua/id/eprint/41724/1/D_Lievit_T_Ievtuhova_INP48T2_IM.pdf

[25] Huralna, Svitlana, Demianko, Nataliia, Sulaieva, Nataliia, Irkliienko, Viktoriia, Horokhivska, Tetiana. "Multimedia Technologies for Teaching Musical Art under Present-Day Conditions." In *International Journal of Computer Science and Network Security*, 24(5), 2024, pp. 165–171. https://doi.org/10.22937/IJCSNS.2024.24.5.18

Boistrup and Selander examined contemporary approaches to research design, teaching, and learning that are oriented toward the future of education in the context of rapid social and technological change.[26] The authors proposed a theoretical framework that integrates various educational practices with an emphasis on innovation, adaptability, and interdisciplinarity.

Finally, participants in a study conducted by a team of authors consisting of Yuryeva et al., when discussing the important personal and professional qualities of contemporary teachers of artistic disciplines, emphasized, among other things, flexibility, the ability to effectively apply the latest digital resources in professional activities, and the desire to continuously improve professional skills, including the use of multimedia technologies.[27]

3. Materials and Methods

3.1. Research procedure

The research was structured in three consecutive stages, which made it possible to comprehensively ensure and ultimately evaluate the impact of the proposed pedagogical model on the formation of the competence of future teachers of music and of the integrated course “Art” in the creation of original educational media products. The first stage involved preparatory work, which included an analysis of contemporary approaches to the digitalization of education and the formation of an experimental teaching model. The second stage involved directly implementing the developed model in the professional training process, with students from the experimental group and the collection of primary empirical data. In contrast, the third stage involved collecting empirical data after the pedagogical experiment, processing and analyzing it to assess the effectiveness of implementing the experimental training model.

As part of the study, an original experimental model was created that combines traditional approaches to music education with concepts of media education and elements of digital creativity. It is based on the concept of a three-component structure of media creation competence, which covers both knowledge of the theory and history of musical art and the arts in general, performing (instrumental, vocal, conducting) skills, and the digital skills necessary for effective pedagogical media creation, as well as a value-emotional attitude towards one’s own professional activity as the basis for professional reflection.

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[26] Björklund Boistrup, Lisa, Selander, Staffan. (Eds.). *Designs for Research, Teaching and Learning: A Framework for Future Education*. Routledge, London, 2021. https://doi.org/10.4324/9781003096498

[27] Yuryeva, Kateryna, Li, Yabin, Wang, Pan. “Personal and Professional Qualities and Skills of Art College Teachers in China: A Phenomenological Analysis.” In *Multidisciplinary reviews*, 8(3), 2025, 2025077. https://doi.org/10.31893/multirev.2025077

The experimental model developed provides for the parallel implementation of three areas of integrated interdisciplinary content in training: cognitive-analytical, creative-design, and reflective-evaluative. The cognitive-analytical direction involved the integration of modern digital technologies into the process of studying general training disciplines (History and Culture of Ukraine, Philosophy, Fundamentals of Economic Theory, Pedagogy, Psychology, etc.), mastering the theoretical foundations of musical art and the arts in general, and performing arts training to develop analytical skills and understand the specifics of media products. The second, creative-constructive direction involved teaching students practical design of original educational media resources, which included mastering multimedia design techniques, audio and video recording and audio and video editing, as well as the application of created author's media resources in compliance with the pedagogical principles of differentiation and individualization of learning.

The third stage of the study involved the use of qualitative and quantitative methods of analysis, in particular, student surveys, didactic and content analysis of the media products created, and their expert evaluation, which made it possible to objectively assess the level of development of the relevant components of the competence under study.

One of the components of the developed model is the introduction of a formula for determining the level of development of the studied competence (C), which looks like this:

$$K=f(M,D,R)$$

Where K is the overall level of media creation competence; M is musical and general artistic and pedagogical knowledge and skills; D is digital skills and ability to work with media technologies; R is reflectivity as the ability to evaluate one's own activities and creative process based on emotional and value-based attitudes towards them. It was the formation of the components of the competence under study – M, D, R – that became the criteria for expert assessment.

3.2. Methods

To achieve the goal, a set of interrelated research methods was used. Competence-based and activity-based approaches were taken into account when selecting the methods. The first is based on a three-component structure of competence – knowledge, skills, and attitude – and is aimed at developing the ability to apply relevant knowledge and skills in pedagogical practice and evaluate the results obtained. The second is aimed at involving students in the active creation of educational media content. The analytical method provided an overview of scientific and methodological literature and

contemporary practices in digital and music/arts education. Theoretical modelling ensured the development of an experimental teaching model. Pedagogical observation made it possible to track the dynamics of student engagement in the process of creating media products.

The pedagogical experiment, which included preliminary and final testing, was formative in nature. It allowed us to test the effectiveness of the developed model in real conditions of the professional training of future music teachers and the integrated course “Art”. To assess the level of musical and artistic-pedagogical knowledge, performance and digital skills, and reflective abilities, a comprehensive diagnostic test developed by the author was used. The first block included tasks for musical-theoretical and artistic-pedagogical analysis of works, aimed at identifying the depth and scope of musicological knowledge and the ability to perform interpretations. The second block covered questions about the didactic capabilities of digital tools (Canva, PowerPoint, BandLab, Audacity, OBS Studio, etc.) and practical cases of their use in the educational process. The third block involved assessing the level of reflection based on emotional and value-based attitudes towards art in general, musical art, and one’s own musical and pedagogical activities.

Participants conducted a self-analysis of their own performance and pedagogical activities, analyzed examples of educational media content, and proposed their own ways to improve it. Testing was conducted twice – at the beginning and end of the experiment – which allowed us to identify positive dynamics for each of the three components of competence (M, D, R). The questionnaire was used to identify students’ subjective value-emotional perception of the content of experimental learning, their progress in professional training, and the level of development of media creation competencies. The questionnaire included 18 questions, 12 of which were closed and six were open, allowing participants to provide detailed reflective answers.

Thematic coverage of the questionnaire included the following areas: 1) level of musical, artistic and pedagogical training; 2) digital creativity skills; 3) emotional and value-based reflective attitudes towards the use of digital media products in pedagogical activities; 4) reflective assessment of personal experience working with educational media products. The quality of the educational media products created by students was assessed by external experts – teachers of music teaching methods and the integrated course “Art”, methodologists and teachers of general secondary education institutions with experience in the field of digital technology implementation. All experts had relevant professional training and did not participate in the development or implementation of the experimental model, which ensured the independence of the assessment. A comparative analysis of the results of preliminary and final testing made it possible to statistically substantiate the dynamics of changes in the level of students’ competence in creating media products.

3.3. Sampling

Students majoring in arts and specializing in three higher education institutions, namely H.S. Skovoroda Kharkiv National Pedagogical University, Admiral Makarov National University of Shipbuilding (NUS), and Donbass State Pedagogical University, participated in the study. The choice was determined by the focus of these HEIs and their departments on music and art education, media literacy, and digital innovations. The total number of respondents was 138, with 84 students aged 17–20 (average age 18.5 at the beginning of the 2022/2023 academic year) included in the experimental sample, 73% of whom were women.

The following inclusion criteria were taken into account: basic knowledge in the field of music education, a high attendance rate (≥85%), and an initial level of digital competence. To avoid distortion of results, students with 6 months of experience in creating educational media products were excluded. The average academic score of participants was 87 (on a 100-point scale). Participation was voluntary, informed, ethical, anonymous, and with the right to refuse. The confidentiality of personal data was guaranteed in accordance with the ethical standards of pedagogical research, and all data were analyzed anonymously.

3.4. Tools

The online service Google Forms was used to collect data, which ensured the convenient collection of questionnaire responses and initial statistical processing. The educational experiment was implemented using the MOODLE distance learning platform, Zoom and Google Meet video conferencing services for synchronous interaction between teachers and students, as well as Canva, BandLab, Audacity, OBS Studio, PowerPoint, and WordWall for creating educational media products. Expert sheets with clearly defined criteria (structure, aesthetics, interactivity, compliance with didactic goals) were used to evaluate the created products. All collected data was processed in Google Sheets, which allowed us to build diagrams and conduct a comparative analysis of the results.

4. Results

4.1. Development and justification of an experimental methodology for training music teachers and an integrated "Art" course in a digital environment.

The preparatory stage of the experiment began in the 2021/2022 academic year, when first-level (bachelor's) higher education students began their professional training in a mixed, predominantly online format due to

quarantine restrictions. Later, under martial law conditions, teachers sought new approaches and tools to help higher education students acquire sufficient performance skills and undergo pedagogical and methodological training remotely.

During quarantine restrictions, teachers have already gained experience in using distance learning tools, including for art and music disciplines. After Russia’s full-scale military invasion of Ukraine, when it became clear that online learning in frontline regions would continue for a long time, the problem arose of enriching the toolkit and developing original teaching methods for first level (bachelor’s) higher education students.

First of all, there was the problem of conducting semester and final assessments remotely. To conduct the qualifying examination in musical arts and music teaching methodology, teachers chose the format of presenting video recordings of students performing concert programmes on musical instruments, singing, and choral conducting, as well as presenting and defending video recordings of lesson fragments using original media works for students.[28] In order for students to be able to present such video presentations to the certification commission at the final certification stage, teachers had to teach them how to create such media products.

Thus, the implementation of the experimental teaching model developed at the preparatory stage of the study in the 2021/2022 academic year took place over the next three academic years – 2022/2023, 2023/2024, 2024/2025, and ended in June 2025 with the final certification of bachelor students – a qualification exam in musical arts and methods of teaching musical arts. For the qualification exam, students submitted video recordings of their performances of concert programme pieces on musical instruments, voice performances, virtual versions of choral performances of pieces from choral conducting, as well as video recordings of lessons conducted remotely in general secondary education institutions during teaching practice. Thus, the experiment lasted four academic years, of which the implementation of the experimental author’s model of teaching lasted three academic years.

During seminars and practical classes in general education subjects (History and Culture of Ukraine, Philosophy, Pedagogy, Psychology, as well as History of Music, Harmony, etc.), students learned to create multimedia presentations in compliance with all didactic and technical requirements, develop interactive online exercises and quizzes, games, and illustrative and demonstration materials.

[28] Vasilyeva, O. “Qualification Exam in Choir Conducting: Distance Format.” In: *Choral Creativity and Education: Understanding Traditions, Mastering Innovations*. Helvetica, 2023, pp. 14–18. https://drive.google.com/file/d/1K_aKZGzhbIW_1ztHFf5eFGned5d-TP8g/view

In musical instrument and voice training classes, students learned to make audio and video recordings of their performances and, together with their teacher and other students, analyze these recordings, which helped them to acquire performance skills and develop artistic and pedagogical reflection. In choral conducting and choral class lessons, students mastered MIDI scores, audio and video recordings of singing and conducting. Subsequently, teachers and students mastered the technology of creating virtual choirs. To this end, they also used audio and video recordings, audio and video mastering techniques, as well as methods for creating and implementing a directorial concept for music videos based on choral performances.[29]

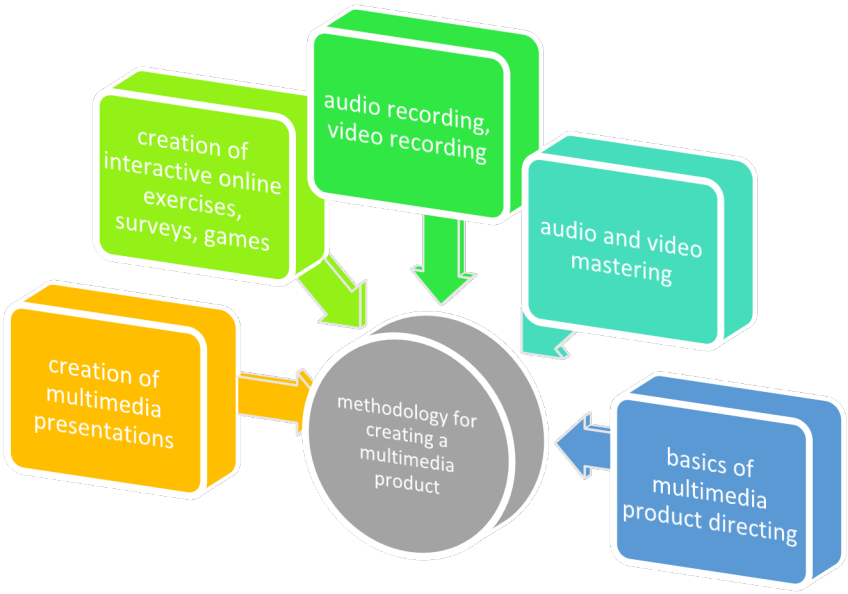
Students also used the skills acquired in this way in classes on methods of teaching music and the integrated course “Art”, and later, during teaching practice at school, to develop and conduct music art lessons and the integrated course “Art” in a distance format, to create original educational multimedia products for such lessons: presentations, slideshows, interactive online exercises, games and quizzes recording thematic didactic podcasts, video lessons, etc. (Figure 1).

Thus, the experimental teaching model that was developed and implemented involved students mastering methods for creating:

- multimedia presentations;
- development of interactive online exercises, surveys, games;
- audio recording;
- video recording;
- audio and video mastering;
- basics of multimedia product directing, etc.

[29] Vasylieva, Oksana, Kalinina, Nataliia, & Malysh, Stella. “Training Future Music Teachers to Create a Video Concept for a Virtual Choir.” In: A. Sokolova (Ed.), *Time of Art Education*. H. S. Skovoroda KhNPU, 2025, pp. 125–129. https://drive.google.com/file/d/1YGvrJrY0yuqvVAzLP5KujLl2ypOa4rZY/view

Figure 1



Content components of the model for training future teachers to create original educational media products
Source: developed by the authors

Let us take a closer look at the stages of ensuring the content component of our experimental model (Table 1). The data in Table 1 show how the complexity of the media products that students learned to create gradually increased from semester to semester. This was achieved thanks to the targeted training in creating such products, integrated into the process of mastering various educational components (academic disciplines, practices, etc.), as envisaged by our experimental model. We analyzed the content of each educational component, including the lists of general and specific competencies to be developed under the programme of each academic discipline, as well as the programme learning outcomes that each discipline and practical training contribute to achieving. The results of the analysis helped to develop a clear plan for the gradual, step-by-step mastery by students of creating various media products, ranging from basic multimedia presentations and online surveys to virtual choirs.

Table 1

Content components of the model	Preparatory stage		Experimental and formative stage						Final analysis stage
	I semester	II semester	III semester	IV semester	V semester	VI semester	VII semester	VIII semester	Final assessment
	Educational components								
Multimedia presentations	Pedagogy, History of Music	History of Ukraine, Pedagogy, Psychology, History of Music	History of Music, Political and Legal Studies, Pedagogy, Psychology, Methods of Teaching Music Arts Methods of Teaching Music Arts	Pedagogy, Psychology, Methods of Teaching Music	Methodology of Music Art Teaching, Integrated course " Art" and methods of teaching it	Methodology of Music Art Teaching, Integrated course " Art" and methods of teaching it	Methodology of Music Art Teaching, Teaching Internship	Methodology of Music Art Teaching, Music Education	Methodology of Music Art Teaching

Content components of the model	Preparatory stage		Experimental and formative stage						Final analysis stage
	I se-mes-ter	II se-mes ter	III se-mes-ter	IV se-mes-ter	V se-mes-ter	VI se-mes-ter	VII se-mes-ter	VIII se-mes-ter	Final assessment
	Educational components								
Online exercises, surveys		School choir singing	History of Music, Pedagogy, Psychology, Methods of Teaching Music	Pedagogy, Psychology, Methods of Teaching Music	Methodology of Music Art Teaching, Integrated course “ Art” and methods of teaching it	Methodology of Music Art Teaching, Integrated course “ Art” and methods of teaching it	Methodology of Music Art Teaching, Teaching Internship	Methodology of Music Art Teaching, Music Education	Methodology of Music Art Teaching

Content components of the model	Preparatory stage		Experimental and formative stage						Final analysis stage
	I semester	II semester	III semester	IV semester	V semester	VI semester	VII semester	VIII semester	Final assessment
	Educational components								
Audio recording, video recording			Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Integrated course " Art" and methods of teaching it, Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Integrated course " Art" and methods of teaching it, Analysis and arrangement of vocal and choral works, Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Main musical instrument, Voice training, Choral conducting, Teaching practice	Methodology of Music Art Teaching, Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Main musical instrument, Voice training, Choral conducting, Choral class

Content components of the model	Preparatory stage		Experimental and formative stage						Final analysis stage
	I semester	II semester	III semester	IV semester	V semester	VI semester	VII semester	VIII semester	Final assessment
	Educational components								
Audio and video mastering			Main musical instrument, Voice training, Choral conducting	Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Integrated course “ Art” and methods of teaching it, Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Integrated course “ Art” and methods of teaching it, Analysis and arrangement of vocal and choral works, Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Analysis and arrangement of vocal and choral works, Main musical instrument, Voice training, Choral conducting, Teaching Internship	Methodology of Music Art Teaching, Main musical instrument, Voice training, Choral conducting	Methodology of Music Art Teaching, Main musical instrument, Voice training, Choral conducting, Choral class

Content components of the model	Preparatory stage		Experimental and formative stage						Final analysis stage
	I semester	II semester	III semester	IV semester	V semester	VI semester	VII semester	VIII semester	Final assessment
	Educational components								
Fundamentals of Media Product Music Directing					Methodology of Music Art Teaching, Integrated course “ Art” and methods of teaching it, Choir class	Methodology of Music Art Teaching, Integrated course “ Art” and methods of teaching it, Analysis and arrangement of vocal and choral works, Choral class	Methodology of Music Art Teaching, Analysis and Arrangement of Vocal and Choral Works, Choral Class, Teaching Internship	Methodology of Music Art Teaching, Multimedia technologies in music education, Choir class	Methodology of Music Art Teaching, Multimedia technologies in music education, Choir class

Content components of the model	Preparatory stage		Experimental and formative stage						Final analysis stage
	I semester	II semester	III semester	IV semester	V semester	VI semester	VII semester	VIII semester	Final assessment
	Educational components								
Virtual choir					Choir class	Choir class	Choir class	Methodology of Music Art Teaching, Multimedia technologies in music education, Choir class	Choral conducting, Choral class

Stages of implementation of the model’s content components in various educational components
Source: developed by the authors

The results of the experiment present changes in the levels of key components of the students’ competence under study under the influence of the proposed experimental learning model.

For further analysis of the experiment results, Table 2 is provided, which shows the dynamics of changes in the levels of M, D, and R in the experimental sample of students, as well as their integrated competence index K, before and after the implementation of the experimental model. This table will allow us to clearly see the impact of the methodology on the formation of key components of the ability to create original media products.

Table 2

Indicator	Before implementing the model	After implementing the model
Level M	3.0	4.7
Level D	2.7	4.5
Level R	3.1	4.8
Index K	2.93	4.67

Average indicators of students' media literacy skills before and after the implementation of the experimental model
Source: developed by the authors

This table presents significant positive changes in the levels of media creation competence components in future teachers of music and of the integrated subject "Art" after the implementation of the experimental model. In particular, the average level of musical and general artistic-pedagogical and methodological knowledge and skills, as well as performing skills and the ability to interpret musical works (M), increased from 3.0 to 4.7 points, which indicates the effectiveness of the model in deepening professional knowledge and skills. The level of digital skills (D), which are critical for creating original educational media products, also showed significant growth – from 2.7 to 4.5 points, indicating that students have successfully mastered digital technologies, allowing them to confidently work with modern digital tools for artistic and educational purposes.

Reflectiveness, based on emotional and value-based attitudes towards musical art and art in general, as well as one's own musical and pedagogical activities (R) – the ability to evaluate one's own performance and productivity – increased from 3.1 to 4. 8 points, which also indicate an increase in the level of self-awareness and critical thinking in students, necessary for professional self-development. The overall competence index (K), which is the average integrated value of the three components, increased from 2.93 to 4.67, representing a significant qualitative leap in the comprehensive development of the professional qualities of future teachers of musical art and of the integrated course "Art".

At the initial stage of the study, it was found that most students had sufficient, but mainly a formal level of musicological knowledge, with a low level of emotional and value-based attitude to music and the ability to perform their own interpretations.

The experimental educational influences involved students mastering audio and video recording technologies for their own performances, learning about performance, musical-pedagogical, and interpretative analysis, and mastering a range of digital tools. Additionally, they learned to create original

media products within the context of musical-pedagogical education. At the final analytical stage of the experiment, an increase in the average score was recorded, which indicates the effectiveness of the experimental model implemented. Students began to apply artistic analysis more broadly and thoughtfully in their own educational developments and performance interpretations, demonstrating not only a deeper understanding of musical material but also an ability to interpret freely. The results of the expert evaluation showed an increase in creative independence, originality of solutions and methodological soundness (Figure 2).

Figure 2

The dynamics of changes in musicological knowledge and the performance and interpretation skills of students
Source: developed by the authors

Analytical data confirm that teaching students to create original educational multimedia products has become a catalyst for interdisciplinary integration, contributed to the expansion of cognitive horizons and the activation of creative potential, which has had a positive impact on students’ motivation for further professional development and self-education. In addition, during the process of creating media products and their collective analysis, there was an increase in interpersonal interaction, collective discussion of creative ideas, joint analysis of various methodological approaches, and coordination of interpretative decisions. Such activities enhanced the development of communicative competence and provided social support for the creative process.

According to the survey, interpretative freedom, as one of the key components of performance skills, increased by 51.79% compared to the initial level. Students noted in the questionnaires that working on media products allowed them to move away from stereotypical ideas about standard interpretation and experiment with different methods of musical analysis, creation and implementation of a performance image, which had a positive effect on their performance and pedagogical confidence.

One of the notable results of the study was the positive change in students' attitudes towards the creation and use of original media products as a valuable educational tool. While at the initial stage most respondents perceived media products mainly as auxiliary tools – visual or technical support for theoretical material in school lessons – after the implementation of the author's model, a qualitative transformation of their pedagogical thinking took place. During the experimental training, students not only mastered the tools for creating digital content but also began to realize its potential as a means of influencing the educational process, student motivation and artistic perception of musical material.

According to the results of the questionnaire, at the final stage of the experiment, 78% of participants acknowledged that media products could be the primary means of presenting educational material. In contrast, at the beginning, only 24% believed this to be the case. At the same time, 65% of students noted that creating original media products contributes to their more profound understanding of lesson content, the structure of educational material, and learning objectives. The dynamics of students' attitudes towards the use of original media products in professional and pedagogical activities are presented in Table 3 and Figure 4.

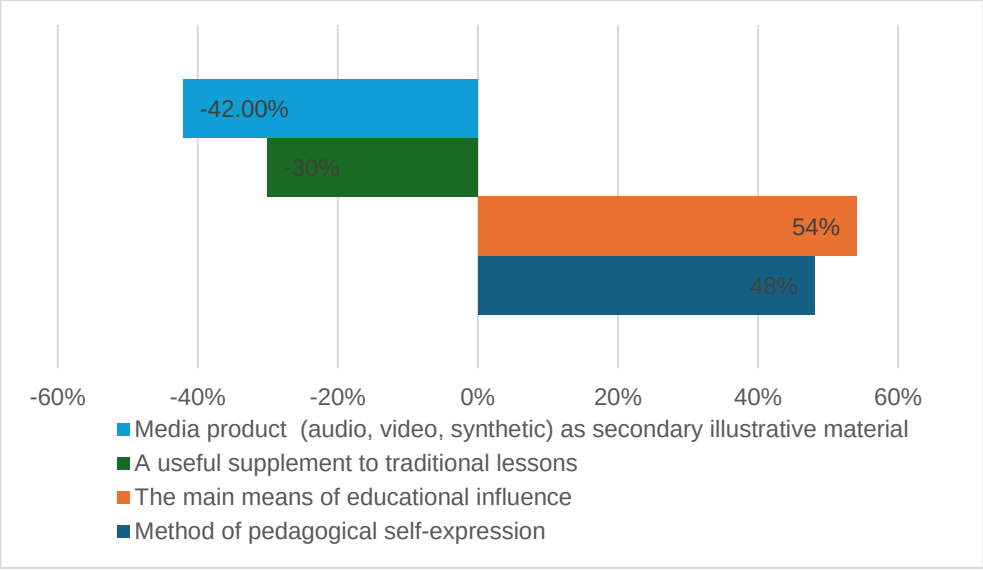
Table 3

	After the imple-mentation of the experimental model	**After the imple-mentation of the experimental model**	**Dynamics**
Media product (audio, video, synthetic) as secondary illustrative material	56%	14%	-42%
Functional supplementary element to traditional lessons	68%	38%	-30%
Primary means of educational influence	24%	78%	+54%
Method of pedagogical self-expression	17%	65%	+48%

Changes in students' attitudes towards the use of copyrighted media products in education before and after the implementation of the experimental teaching model
Source: developed by the authors

Let us illustrate the results of comparing students’ attitudes towards the use of copyrighted media products in their professional activities before and after experimental training in Figure 3.

Figure 3



The dynamics of students’ attitudes towards the use of copyrighted media products in professional teaching activities before and after the implementation of the experimental teaching model
Source: developed by the authors

In addition, the students’ subjective position has significantly strengthened: in their final open-ended responses, they emphasized the importance of the author’s approach as a manifestation of pedagogical autonomy. Many of them began to view media products not as a tool for transferring ready-made knowledge, but as a means of pedagogical interpretation and personal self-expression within the educational process.

A separate vector of positive dynamics was the expansion of the range and level of development of students’ creative skills in the process of creating audio, video, synthetic and interactive educational resources. Participants in the experimental training not only mastered the technical tools for media production but also demonstrated a noticeable increase in their ability to conceptualize their own ideas, seek non-standard ways of presenting material and create aesthetically coherent, stylistically balanced products. An analysis of student work shows a gradual shift from template-based presentations to creative, original solutions. The projects began to feature elements of video lessons with

original editing and sound design, podcasts with original scripts and interviews, as well as interactive tasks combining animation, gamification, and didactic principles of art education. Students learned to create media products that were not only functional but also artistically expressive, taking into account the logic of composition, emotional impact, and the reaction of the target audience (Table 4).

Table 4

Type of media product	Examples of tools used	Share in total (%)	Distinctive features	Time spent per unit of product (average)
Video lessons	OBS Studio**,** Canva	32%	Own video editing, music samples, titles, subtitles	4 hours
Podcasts	Anchor by Spotify, Audacity	18%	Script, unique text, background music	2.5 hours
Interactive exercises	Canva, Wordwall	10%	Animation, hyperlinks, tasks with visual accompaniment	2 hours
Audio lessons	BandLab, Audacity	15%	Voice recording, music inserts	3 hours
Presentations with embedded video/audio	Canva, PowerPoint	11%	A combination of different formats	1.5 hours
Virtual choirs	Audacity, Adobe Audition, Reaper, Logic Pro X (macOS), Cubase	15%	Combination of different formats	3 hours

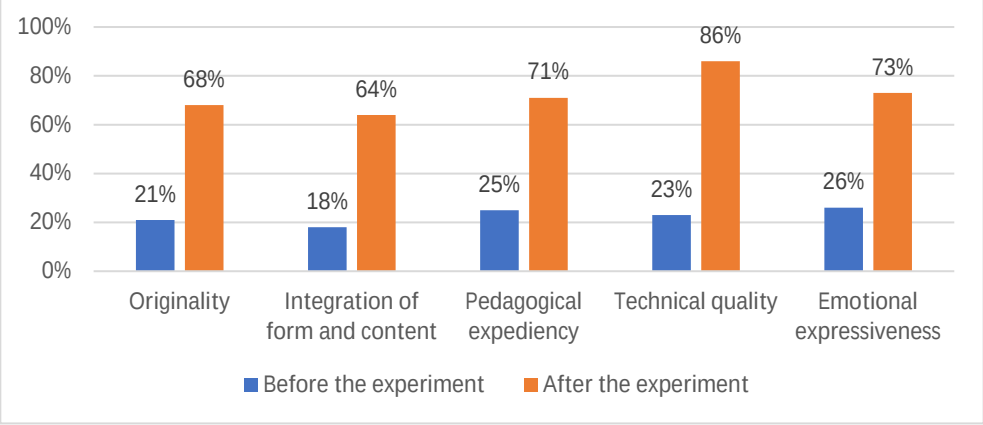
Typology of the Author's Media Products
Source: developed by the authors

The percentages in the table reflect the share of each type of media product among all those created by students during the experimental stage of training, i.e. in the process of implementing the author's training model. The most common format was video lessons (34%), which indicates an increase in students' willingness to work with video editors and integrate different types of content (sound, images, text, animation) into a single learning structure. Podcasts and interactive exercises were also popular (21% and 19% respectively); they required less technical complexity, while still demanding scenario thinking and digital design tool proficiency from students.

Presentations with embedded elements accounted for the smallest share (11%), likely due to their less innovative format, as well as audio lessons (15%), which students primarily chose during the initial stage of skill formation. The easiest to implement were linear formats with minimal interactivity (presentations, audio lessons), while the most difficult were those that required a deeper understanding of multimedia editing and structured design of educational material (video lessons, interactive exercises, virtual choirs). It should be noted that the virtual versions of choral works created by students were not included in the statistical analysis, as they became a mandatory form of work and one of the forms of reporting during the qualification exam in the final attestation process.

An expert assessment of the level of creativity in student media products showed a significant increase in creative initiative based on the conscious use of musical and pedagogical knowledge in combination with technological tools (Figure 4).

Figure 4



Improvement in the quality of original media products
Source: developed by the authors

The most dynamic growth was observed in technical quality, increasing from 23% to 86%, which indicates a significant improvement in digital tool skills. High growth was also observed in terms of pedagogical relevance (from 25% to 71%) and emotional expressiveness (from 26% to 73%), which indicates a more profound understanding by students of the educational function of media content and the ability to communicate content expressively through artistic means. The indicators of originality (an increase from 21% to 68%) and the integration of form and content (an increase from 18% to 64%) confirm the development of the author’s vision and ability to think structurally in the process of creating an educational product.

After implementing the experimental training model, students showed a significant increase in their musical and pedagogical knowledge, digital skills, and reflective abilities, based on an emotional and value-based attitude towards art and their own artistic and pedagogical activities. The overall index of competence formed increased significantly, confirming the effectiveness of the comprehensive model for developing the professional competence of future music teachers in media creation and the integrated course “Art”.

5. Discussion

The study revealed that working with educational media products, which required a deep understanding of each stage of the creative process, played a special role in shaping the professional self-awareness of future teachers of music and of the integrated course “Art”. Students gradually developed the ability to see themselves not only as performers, but also as active initiators of purposeful pedagogical influence, responsible for the quality of communication with their future audience. The central category of this process is reflection, which allows students to interpret their own activities not only from the perspective of external assessment criteria, but also through the prism of internal professional values and identity.

A significant improvement in reflectivity indicators, manifested primarily through an increase in scores in the assessment of the ability to perform original interpretations, emphasized the importance of this personal and professional phenomenon in the field of music education. Similar conclusions were reached in the work of Gyamfi et al.[30] The authors emphasized that integrating structured support into the assessment process has a positive impact on the quality of the content created and the development of critical thinking. They also noted the importance of developing students’ ability to self-analyze and provide constructive feedback, which contributes to a deeper understanding of the teaching material and the development of professional competencies. The authors claimed that the organization of collective reflection is key in educational media initiatives and enhances their pedagogical value.

Zhang et al. noted that integrating creative content creation into the learning process helps develop critical thinking, logical analysis, and problem-solving skills, which are key components of professional thinking.[31]

[30] Gyamfi, George, Hanna, Barbara, Khosravi, Hassan. “Supporting Peer Evaluation of Student-Generated Content: A Study of Three Approaches.” In *Assessment & Evaluation in Higher Education*, 47(7), 2021, pp. 1129–1147. https://doi.org/10.1080/02602938.2021.2006140

[31] Zhang, Yifan, Mirzaei, Amanda M., Mouza, Chrystalla, Pollock, Lori, Guidry, Kevin. “Examining Computational Thinking across Disciplines in Higher Education Classrooms: Learning

We agree with the authors' conclusions. The value of students creating media products was also noted by Kenna, who studied the potential of student podcasts as a tool for science education, and Hall and Jones, who researched student podcasts as an effective tool for distance learning.[32]

The study showed that the use of modern digital tools allows expanding opportunities for active student engagement in the learning process, ensuring individualization of the educational experience and creation of adaptive media products. In addition, technology stimulates the development of students' creative potential, allowing them to experiment with different formats for presenting musical and artistic material in general and to create multimedia content that meets modern educational requirements. Similarly, in her work, Gül found that the use of digital platforms, software for creating and analyzing music, interactive presentations and online resources significantly contribute to increasing student motivation, enriching their musical experience and individualizing the learning process.[33]

Parkita concluded that the use of modern digital platforms, mobile applications, and online resources significantly expands the possibilities of music education, especially in the context of distance or blended learning.[34] We agree with Parkita's conclusions. In turn, Stefanova et al. noted that the creation of digital content stimulates students' involvement in creative activities, which is consistent with the results of research on the relevance of creating media products in the field of musical art.[35]

The study found that the use of digital multimedia technologies in education also contributes to the development of metacognitive processes, in particular self-reflection and critical thinking, as students are allowed to

Outcomes from Student-Generated Artifacts." In *Journal of Computing in Higher Education,* 2025. https://doi.org/10.1007/s12528-024-09425-1

[32] Kenna, Therese. "Podcasting Urban Geographies: Exploring the Usefulness of Student-Generated Academic Podcasts for Deep Learning and Education for Sustainable Development.: In *Journal of Geography in Higher Education*, 47(4), 2022, pp. 533–552. https://doi.org/10.1080/03098265.2022.2122030; Hall, Naomi M., Jones, Jason M. "Student-Produced Podcasts as a Teaching and Learning Tool." In *American Journal of Distance Education*, 37(1), 2021, pp. 53–65. https://doi.org/10.1080/08923647.2021.1995256

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[34] Parkita, Ewa. "Digital Tools of Universal Music Education*." In Central European Journal of Educational Research*, 3(1), 2021, pp. 60–66. https://doi.org/10.37441/cejer/2021/3/1/9352

[35] Stefanova, Petya, Stefanov, Pavel, & Doychinov, Yordan. 2021. "Creating Digital Educational Content – Opportunities and Perspectives for Creative Interaction in Music Education." In: *13th International Conference on Education and New Learning Technologies*." IATED, 2021, pp. 4606–4611. https://doi.org/10.21125/edulearn.2021.0958

analyze and adjust their own activities. Rahmaturrizki and Sukmayadi noted that resources such as educational videos on YouTube can significantly complement traditional educational materials.[36] We agree with Yan and Xia, who showed that the use of technologies such as virtual reality and artificial intelligence significantly enhances the effectiveness of students' learning, primarily by increasing engagement and personalizing the learning experience.[37] In their work, Michałko et al. came to conclusions that are consistent with the results of research on media products in music education.[38] However, the authors also emphasized that the effective use of technology should not be limited to technical support for lessons, but should contribute to a deeper, more meaningful musical experience.

5.1. Limitations

The study involved a limited sample, which may affect the representativeness and generalizability of the results obtained. Additionally, the focus on a specific group of students of art majors and specializations in higher pedagogical education institutions limits the applicability of the conclusions in a broader educational context.

5.2. Recommendations

Recommendations for further research include expanding the sample by involving students from different levels of higher education and different institutions of higher pedagogical education. It is also advisable to study the impact of technology integration on the professional development of teachers in the process of continuing education.

6. Conclusions

The study found that the integration of musical and pedagogical knowledge, performance and interpretation skills, digital skills, and reflexivity contributes to a significant improvement in the professional training of future teachers of music and the integrated course "Art". The introduced model for developing the competence to create original educational media products, K = f(M, D, R), has proven its effectiveness, as reflected in a significant increase in all components – musicological, performance and interpretation,

[36] Rahmaturrizki, Muhammad I., & Sukmayadi, Yudi. "YouTube as Audio Visual Media Learning in Music Education." In: *3rd International Conference on Arts and Design Education.* Atlantis Press, 2021, pp. 297–303. https://doi.org/10.2991/assehr.k.210203.064

[37] Yan, Jin, Xia, Xiongjun. "Interactive Audio-Visual Course Teaching of Music Education based on VR and AI Support." In *International Journal of Human–Computer Interaction*, 40(13), 2023, pp. 3552–3559. https://doi.org/10.1080/10447318.2023.2190668

[38] Michałko, Aleksandra, Campo, Adriaan., Nijs, Luc, Leman, Marc, Van Dyck, Edith. "Toward a Meaningful Technology for Instrumental Music Education: Teachers' Voice." In *Frontiers in Education*, 7*, 2022*. https://doi.org/10.3389/feduc.2022.1027042

digital, and psychological and pedagogical. The overall competence index (K), which is the average of the three components, increased from 2.93 to 4. 67, confirming the high pedagogical potential of the developed experimental teaching model and its effectiveness in forming integrated musical and digital competencies of future teachers of music and of the integrated course “Art”.

The study yielded results indicating a significant improvement in all components of students’ media literacy after the implementation of the experimental teaching model. The level of musical and pedagogical knowledge and performance and interpretation skills (M) increased from 3.0 to 4.7, digital skills in working with media technologies (D) increased from 2.7 to 4.5, and reflectivity (R), which is responsible for self-assessment and critical analysis of one’s own activities, increased from 3.1 to 4.8 points. The overall competence index (C), which is a function of these three components, almost doubled – from 2.93 to 4.67.

The study also revealed positive dynamics in the level of interpretative freedom, indicating the ability of students to go beyond traditional performance canons and introduce innovative approaches into musical and pedagogical practice. The results showed that a comprehensive approach combining music and pedagogical education with technological support and reflection provides a deeper understanding of the professional role of a teacher of music and the integrated course “Art” and forms a stable motivation for professional self-improvement. In addition, the results confirmed that musicology and performance aspects are not only a necessary theoretical and practical basis, but also an active factor in the development of students’ professional and creative qualities. The study showed that the integration of musicological knowledge and performance skills into the process of creating educational media products stimulates interpretative freedom and contributes to the formation of the creative personality of future teachers of music and of the integrated course “Art”, which meets the modern requirements of professional education.

The scientific novelty of the research lies in the development and testing of a comprehensive model for the formation of important professional competencies of future teachers of music and of an integrated course “Art”, which requires musical and pedagogical knowledge, performance and interpretation skills, digital skills, and reflexivity. The practical value of the work is manifested in the creation of recommendations for the implementation of the author’s educational media products in the educational process, which contributes to improving the quality of music and pedagogical education and developing the creative potential of students in the context of modern technological challenges. Prospects for further research include refining the criteria for evaluating educational media products, developing a typology of integrated artistic media formats, and examining their impact on student motivation in school courses for musical arts and the integrated course “Art”.

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