A Survey Analysis of Art Teachers' Use of Transmedia Technology

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Abstract

Transmedia technology is a modern innovative system which scientists consider to be real communication revolution. Transmedia technology is investigated and actively implemented in different life spheres and social activities, such as mass media, journalism, marketing, culture, education etc. There is an urgent need to study the opportunities of using the transmedia technologies in art education, in particular in music teachers' professional training. The implementing of transmedia technology in music teachers' professional training contributes to the qualitative development of their professional competence, broadening of their outlooks, the improvement of artistic abilities, and professional skills. To study in detail both teachers' and HEI students' mastering of transmedia technology, the online survey "Transmedia Technology in Art Education" was held. HEI lecturers, secondary school Art teachers, teachers of Art school in Sloviansk, students of SHEI "Donbas State Pedagogical University" and Communal Institution "Pokrovsk Pedagogical College" took part in this questionnaire. The analysis of tests has proved the low level of acknowledgement about the essence of transmedia technology. However, it has demonstrated a high level of general technology knowledge and skills that makes it possible to implement the transmedia technology in educational process. We have revealed a number of issues which require the attention and further development.
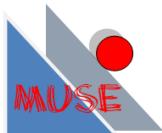
1. Introduction

The concept of transmedia technology is rather new in modern science. It has become popular in the previous decade and it is considered in the sphere of journalism and mass media. The emergence of this phenomenon is greatly connected with the constant development of digital technologies and their active implementation in all spheres of human activities.

The founder of the concept "transmedia" is considered to be American philosopher and culturologist Jenkins (2003) who explains the concept of "transmedia" as "across media". The researcher uses the modern concept "transmedia" in the chapter "storytelling", paying special attention to the multiplatform, the extend, and the interactivity of storytelling.

In literary sources, the concept of "transmediality" is also used in the context of multiplatform that is characterized by a diversity of platforms, channels, and media forms (Jenkins, 2003).

Transmediality is one of the signs of the modern phenomenon of technological media culture. The main advantage of new technology is an opportunity to create a polyphonic (syncretic) communication platform, which has various elements combined by one theme (Al-Khanaki, 2016).

In Ukrainian literature, the conceptual framework of transmedia is developing. Based on the analysis of foreign researches, Ahrikova (2016), Vyhovska (2014), Zenchenko (2019), Zhurba (2018), and Tormakhova (2018) study conceptual variability of transmedia in the scientific discourse of the digital age.

Some researchers (Al-Khanaki, 2016; Zhenchenko, 2019) think that the concepts of "transmedia" and "transmedia storytelling" are equal, implying a way of storytelling that disseminates information using different media platforms. Whereas some scientists (Ahrikova, 2016; Vyhovska, 2014; Jenkins, 2003) distinguish them as two different concepts. Thus, Ahrikova (2016) defines transmedia as a set of principles that identify the development of a media product: dissemination, distribution, engagement, seriality (multivectory), length (form openness), subjectivity, immersiveness, and co-creation; however, transmedia storytelling is a product of the professional activity, developed according to the principles of transmedia.

So, transmedia is an important issue in journalism, which is full of news and reports. In marketing, it is a brand for wide dissemination among users; in art, as it combines a variety of genres, types, manifestations, and it is represented by several art lines and stories in mass media platforms (media), which include both seven traditional technological aspects (printed publication, audio and video records, radio, cinema, television, computer networks, and mobile technologies) and means of non-verbal communication (body language, gestures, facial expressions, etc.) (Scolari, 2016).

We have defined the concept of transmedia technology as a complex system of combining various languages (digital and non-digital; verbal and non-verbal) and formats (video, comics, games, books, etc.), providing integration of modern media formats with digital technologies. Revealing the concepts of a narrative occurs at several platforms: a book, a film, Internet-resources, social and interactive media environments. This makes an effect of kaleidoscopic perception that has a positive influence on attention, active position, a level, and the amount of material to master (Jenkins, 2003).

After disclosing the opportunities of transmedia technology in different spheres of professional activities, it's essential to emphasize that there isn't much experience of using transmedia technology in future music teachers' training. However, a wide range of documented cases of implementing transmedia strategy in educational activities suggests the benefits of using transmedia technology while studying the artistic and aesthetic academic disciplines.

So, the objective of the study is to analyze music teachers' mastery of transmedia technology that contributes to improving their professional competence.

2. Literature Review

The experience has proved the benefits of using transmedia technology in different social spheres: marketing, journalism, design, culture education, etc. So, one of the founders and active supporters of transmedia technology Scolari (2018b) pays special attention to the benefits of transmedia strategy in branding in his article "Transmedia Branding: Brands, Narrative Worlds, and the Mcwhopper Peace Agreement". According to his point of view, transmedia narratives influence
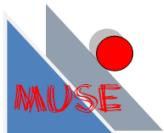
the recombination and flexible change of branding that makes it possible to follow the transmedia Universe all over the world.

Also, Scolari, Masanet, Guerrero-Pico, & Estables (2018) emphasize the feasibility of using the transmedia strategy for the development of teenagers' transmedia skills and informal learning strategies, giving an example of creating the transmedia Universe of archaeological site Atapuerca (Burgos, Spain), announced to be an object of the world heritage by UNESCO. The scientists point to the problem of bifurcation of communication policy while publishing the results of the research of the real existence of Atapuerca (information for both the scientists and society members). The purpose of the scientific experiment is to create a transmedia model of the Atapuerca Universe, which, on the one hand, is controlled by producers-scientists and, on the other hand, it is shared by prosumers (disseminators, users) who complement, exchange, change and generate new content by using social networking sites (Facebook, Twitter, Instagram, YouTube, etc.). Modern scientists consider transmedia as one of the communication types that is influenced by contextual factors (culture, history, politics, ideology, education, and interpretive communities). Transmedia storytelling is of special importance as it is widely used by mass media as narrative transmediation (Ryan, 2020; Chinita, 2020).

Transmedia is also used in film production and TV for making special effects. Making a review of B. Rehak's More Than Meets the Eye: Special Effects and the Fantastic Transmedia Franchise, Wood (2020) discusses the transmedial approach to special effects. He says that special effects stay behind the screen images which are created in the context of a negotiated dialogue with fan culture.

The researchers show and prove that the strategies of transferring information by the use of transmedia technology can be implemented in scientific projects. Chenu et al. (2014) describe the project CULTE (Cultural Urban Learning Transmedia Experience) that is aimed at studying the role of museums in suggesting new ways of interacting with the cultural heritage, as well as using the transmedia storytelling for interpreting cultural heritage. The project authors analyze how transmedia technology can help designers develop narratives and museum workers make media texts and develop games. It can integrate the industry of entertainment and museum context.

Brusk & Engstrom (2020) present a unique inclusive transmedia project, called Marvinter, that focuses on making radio series and mobile games with similar episodes. The project is designed for people who have hearing or vision impairment that is why transmedia technology is needed due to its multi environmental nature.

Yeates (2020) reveals the successful use of transmedia technology for making art series, in particular fiction podcasts. The Adventure Zone is given as an example that shows the changes in modern culture through transmedia, fan-focused form of storytelling, and other forms of new media technologies.

Garcia-Roca (2020) presents an original view of the interpretation of literary works by the use of digital tools. Digital reading is determined not only by the nature of the text (structure, textuality, or support) but also by the behavior of digital readers who can create communities, discuss, analyze and develop fan-works. As a result, multilinear, hypertextual, and transmedial reading emerges.

The scientific development of Dalelio (2020), who works on the collaborative identity project, is of special interest in the context of our study. This project focuses on media literacy, identity, technology, digital media, social media, mediated communication, and interpersonal communication. The main objective of the project is to disseminate the transmedia experience in the digital environment.

The scientists García-Marín & Aparici (2018) substantiate the importance of using transmedia strategy in the information sphere. The authors establish a parallel between the transmedia technology and podcasts, calling them a new sound communication. We consider podcasting to be a radio on the Internet that can broadcast audio and more rarely video offline (What are podcasts, 2019), to be the dissemination of the audio and video content according to the chosen theme through the Internet (Myatin, 2006). Having analyzed the Spanish podcasts and using in-depth interviews, the authors substantiate the significance of a multiplatform strategy where messages are presented in a wide range of platforms and complement one another. The researchers show the positive results of broadcasting information materials in different media languages that contribute to the complete disclosure of the content.

Transmedia is also regarded as a type of digital technology. Shim, Yecies, Ren & Wang (2020), analyzing some well-known digital webtoons (digital comics) and online platforms for
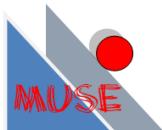
webnoveling (a novel, published on the web platforms), confirm the transformation of creative work and the emergence of transmedia intellectual property (IP).

Transmedia technology contributes to developing digital literacy. The scientific findings of Alves, Ricardo, Flexor & Ochi (2020) and Girón García & Navarro Ferrando (2014) prove the urgent need to develop media and transmedia literacy of all the people as the net promotes sharing of multimodal content at different platforms and requires users to have new skills to work with various hardware, software and their protocols. Sime & Themelis (2020) have introduced the concept of transmedia identity that is determined as the ability to make and manage multiple identities on different platforms. The scientists assert that transmedia identity is the essential competence for online educators. Sixto-Garcia, Melo & Guilhermina (2020), focusing on the necessity to improve the digital competence of university teachers, think that it is crucial to integrate transmedia storytelling with other technological innovations.

The forms of transmedia storytelling are studied by Javanshir, Carroll & Millard (2020), who present their model for disclosing the fundamental structural features of transmedia storytelling. They also distinguish three groups of patterns that are identified in all transmedia stories.

Moya & Moya (2018) explore the sphere of implementing transmedia technology in management. The scientists call "transmedia storytelling" the real communication revolution or a new business model. In the world of the constant digital revolution, they pay attention to the new paradigm of content generation and improvement of digital networking technology connection. These factors have a positive impact on the development of the collaborative environment by working together. Transmedia strategy provides strong links between producers of goods and services, advertising agencies, mass media, and society. The Internet and social networking sites allow citizens to defend their interests and values of branding. The authors consider prosumers (citizens) to be "a smart swarm" that acts as not only an observer with limited opportunities of the expression, they (prosumers) become the real investors. They mean emotional, social, and intelligent investments.

The authors substantiate the importance of implementing the transmedia strategy in the marketing that contributes to generating the importance, degree, and dependence of a continuous process of participation in common activities. The key factors of the success and the efficiency of
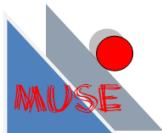
advertisement is the level of satisfaction which makes the members of the advertisement take part in transmedia designing and communication strategy of brands.

The conclusions, made by Gonzalez-Diez, Puebla-Martinez & Perez-Cuadrado (2018), about the importance of implementing the transmedia technology in the sphere of design ("From Layout to Transmedia Narrative: A Review of the Concept of "News Design"), are important for our research. The scientists point to the significant changes that take place in the area of journalism. These changes concern not only the style and form of presenting the news but also their external arrangement and design. The design in mass media is connected with several spheres: paper design, web-design, news design, etc. It is changing all the time and includes new elements. Previously, the design layout was based on images, colors, and compositions. Nowadays it is supplemented by sound, video, and active links, which connect them (hyperlinks, QR codes, etc.). That means the use of transmedia technology contributes to bringing users closer to their usual communication style while developing the design layout.

Mateos-Rusillo & Gifreu-Castells (2018) disclose the area of using transmedia technology in museums, giving the National Museum del Prado as an example. The scientists analyze traditional ways of the functioning of museums and define the level of an approximation of the Bosch project to the didactics of transmedia storytelling. The scientists assert that museums naturally use transmedia technology in their practice for describing historic events over the past decades, without recognizing its implementation.

In education, transmedia technology plays an important part. Beskorsa (2017) studies the ways of implementing transmedia technology for developing the virtual learning environment for future teachers' training. McCarthy, Tiu & Li (2018) disclose the feasibility of implementing the transmedia technology while learning mathematics in preschool and primary school period ("Learning Math with Curious George and the Odd Squad: Transmedia in the Classroom"). They have conducted two pieces of research. During the first one, preschool teachers had been doing mathematical problems with the animation character "Curious George" for four weeks. The games involved the materials and video-episodes, downloaded from the free web site Curious George. They were also supplemented with the materials from books and other general learning activities. The research included the observation, interview with teachers-participants, and control questionnaires. According to the mathematical results of questionnaires, the level of knowledge had
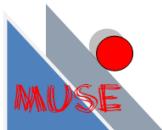
increased considerably that proved the positive influence of transmedia technology on preschool children's mathematical knowledge.

In the second research, the learning process included digital and non-digital learning resources from the popular social series Odd Squad (video, online games, commercials, practical tasks from transmedia package Odd Squad). The research contained an oral and written assessment of the first-year students' mathematical skills, interviews with students and parents. After experimenting, the considerable improvement was noted in the level of general mathematical knowledge in numbers and operations with them, as well as in algebraic thinking and vocabulary. The scientists claimed that the implementation of transmedia technology in the learning process contributed to the students' motivation for learning activities. Moreover, the authors said that the game was the main activity in the preschool and primary school period.

Thus, we are sure that transmedia technology has an influence on different spheres of social life, including education. We suppose that the use of transmedia technology in music teachers' professional training contributes to the qualitative development of professional competence, broadening of the outlook, the development of artistic abilities and professional qualities.

To predict the implementation of transmedia technology in music teachers' professional training, it is necessary to study the present state of information and communication awareness of future and practicing educators. It is important to understand which knowledge and skills students have, which communication and digital skills they use in their activities, which level of motivation for the use of innovative technologies in their practical and everyday activities, in particular the transmedia technology, they have.

3. Methodology of Research

The research is based on the quantitative method used for measuring university students' and lecturers' level of the knowledge and mastering transmedia technology. The research sample were gained from 40 students of State Higher Education Institution "Donbas State Pedagogical University" and Communal Institution "Pokrovsk Pedagogical College" and 31 university lecturers and secondary school music teachers. The students were selected based on the study year, they
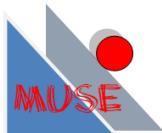
were three-year and four-year students who had already studied the courses of teaching methods of music and might be aware of the essence of transmedia technology. The lecturers were selected based on their engagement in the process of music teachers' training, as well as school teachers were engaged in the process of teaching music. The lecturers worked at the Department of Primary Education Theory and Practice, the Department of Music and Choreography, music teachers were from Sloviansk secondary schools and Sloviansk Art school.

So, we organized online survey "Transmedia Technology in Art Education" for students, university lecturers and school teachers. Each survey participant had to answer 12 questions. Online questionnaires were developed on the Google-platform. The survey reference for students (https://forms.gle/1jkyC7BRPAA4xacC6), lecturers and school teachers (https://forms.gle/e4s8eVbyRqcDPPoy6) were provided by the department administrative staff. The participation in the survey for all the respondents was voluntary.

The survey questions for defining the general level of students' and teachers' (lecturers') knowledge (awareness) in the field of transmedia technology were divided into three blocks by their content and research area (Table 1):

- block 1 includes questions about the level of knowledge and understanding of transmedia technology definitions, the awareness of the concepts that concern this technology;

- block 2 contains the questions for defining the level of knowledge and using cloud services and IC technologies whose knowledge contributes to the implementation of the transmedia technology.

- block 3 is aimed at disclosing the level of motivation and readiness to use transmedia technology while doing learning and professional activities.

Table 1 List of survey questions.

1. Are you familiar with the concept of "Transmedia Technology"?
2. What is transmedia?
3. Which of the proposed concepts don't you understand: media, convergence, content, multimedia, media platform, media format, hyperlinks, interactive poster, blog, chat, QR code?
4. What modern ICT technologies do you use in your learning/teaching activities?
5. What elements of ICT technologies do you use in your work?
6. Are you an active user of multimedia software?
7. What online services do you know?
8. Are you aware of the concept "Cloud Services"?
9. What cloud services do you know?
10. Are you an active user of social networking sites?
11. Are you interested in the issue of transmedia technology?
12. Do you want to use transmedia technology in learning/teaching activities?

4. Research Results

We proceed to analyzing the results of the students' survey. 17 Master students, 21 Bachelor students, and 2 junior Bachelors participated in the survey (Table 1).

Table 2 Analysis of the level of students' awareness of the definition "transmedia technology"

	Hear for the first time	See in the papers and conference proceedings	Know and study	Use in their practical activities
Master students	3 (7,5%)	11 (27,5%)	2 (5%)	1 (2,5%)
Bachelor students	12 (30%)	4 (10%)	1 (2,5%)	-
Junior Bachelors	1 (2,5%)	1 (2,5%)	-	-

Answering the question "Do you know anything about "transmedia technology"?", 20 respondents (50%) answered that they had never heard about it before; 16 students (40%) said that they had seen and heard about it in scientific papers and conferences; 3 participants (7,5%) said that they knew about this technology and they were studying this issue; only 1 respondent (2,5%), who was a Master student, was a member of the transmedia project. Also, Master students presented the highest number of participants, who saw the concept "transmedia technology" in papers and proceedings of conferences – 11 persons (27,5%); two students (5%) were familiar with the definition and were studying it. Only three students (7,5%) claimed that they heard this definition for the first time. The Bachelor students had lower indicators: 12 of them (30%) heard

for the first time: 4 students (10%) had seen in papers and proceedings of conferences; 1 respondent (2,5%) was familiar with the issue and was studying it. Taking into consideration a small percentage of students, who knew the definition "transmedia technology", the answers on the second questions were unexpected for us. Answering the question about what the transmedia technology was, 19 respondents (47%) defined this concept correctly. It was an interesting fact that 11 of them heard the concept for the first time. This leads us to conclusions about an intuitive understanding of the proposed concept or a sufficiently high level of general digital awareness.

To answer the third question "Which of the concepts given can't you understand?", the students were proposed the concepts that they could often see in the context of the transmedia technology: media, convergence, content, multimedia, media platform, media format, hyperlinks, interactive poster, blog, chat, QR code. The results of this survey showed that the largest number of respondents (32 – 86,5%) were not familiar with the concept "convergence", the concept "content" (8 participants – 21,6%), and "interactive poster" were significantly less problematic. The unknown concepts were the following: QR code – 5 (13,5%), media platform – 4 (10,8%), media format – 4 (10,8%), hyperlink – 2 (5,4%), media – 1 (2,7%) and multimedia – 1 (2,7%) (fig. 1).

Thus, analyzing the first block of questions, we could see that the issue of transmedia technology was quite new for students. The number of students, who had never heard about this concept before and were familiar with it only superficially, was approximately the same. The students who studied to obtain Master's degree had better awareness of the issue. This leads us to the conclusion that Master students were more interested in scientific and research work than Bachelor students. Taking into consideration a high percentage of participants who gave correct answers, defining "transmedia" (in particular, students who had heard this concept for the first time), we could conclude that the understanding of this concept was intuitive. The analysis of unknown concepts let us define the frameworks of the issues that need attention and further study.
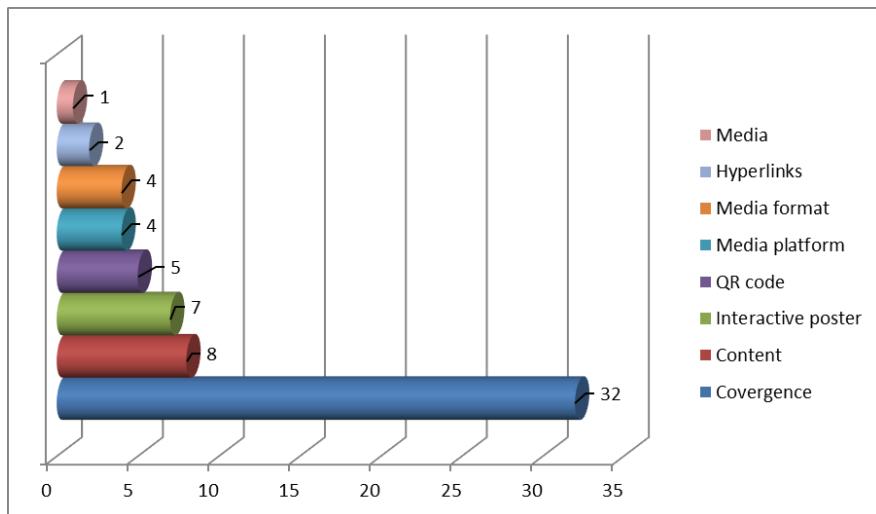
Figure 1. Unfamiliar concepts that concern the transmedia technology

The analysis of the answers of the second block proved that about half of the respondents (18 persons – 45%) always used cloud services in learning and everyday life, 8 persons (20%) studied the opportunities to use the cloud technologies; and the certain number of participants (7 persons (17,5%) of the whole number of respondents) were unfamiliar with the concept "cloud services" or were uninterested in this issue (fig. 2).
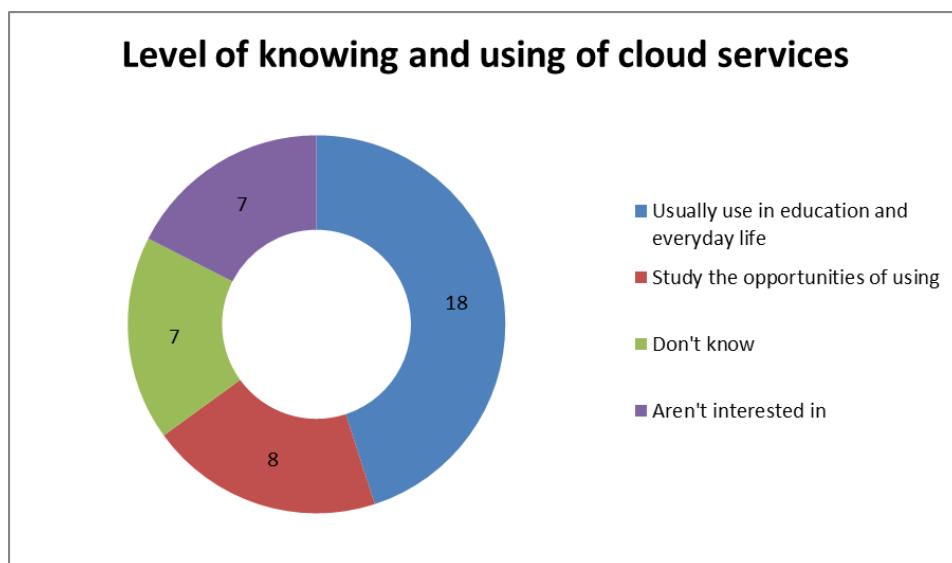

Figure 2. Level of knowledge and using cloud services

We should note that Google Disk was the most popular cloud service, 32 respondents (80%) were familiar with it; 17 persons (42,5%) knew Microsoft Sky Drive; 11 respondents (27,5%) were familiar with Dropbox; 7 respondents (17,5%) – eDisk; 3 persons (7,5%) – Mega service; 1 participant (2,5%) proposed his/her variant of sound service – iCloud.

The survey also proved that the students actively used modern IC-technologies in their learning activities: mobile learning – 26 respondents (65%); multimedia technology – 25 (62.5%); distance learning – 19 (47%); blended learning – 16 (40%); open online courses – 15 (37,5%). And only 1 (2,5%) respondent didn't use IC-technologies in the learning (fig.3).
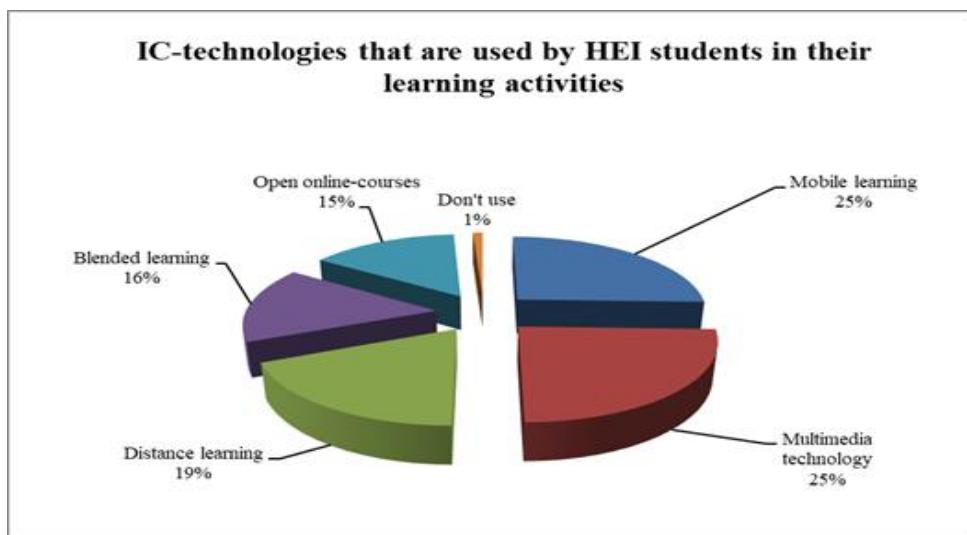

Figure 3. IC-technologies that are used by university students in their learning activities

We've found out that most students (34 participants (85%)) used multimedia presentations in their learning practice. Also, a great number (28 participants (70%)) actively implemented e-mail resources and looked for information on the Internet. 26 (65%) participants of the survey used electronic multimedia guides. Much fewer students (13 persons (32.5%)) took part in the online stream of webinars, conferences, etc., 12 persons (30%) made interactive posters, 12 persons (30%) used QR-codes, 8 persons (20%) – electronic journals and diaries.
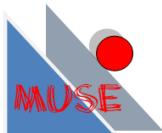
That's expected that among software Word – 38 participants (95%) and PowerPoint – 26 participants (90%) were the most popular. Also, students almost equally used Excel (22 respondents (55%)) and PhotoShop (20 students (50%)). The level of the students' knowledge about learning online services has also drawn our attention: about half of the participants (17 persons (43,6%) were familiar with Learning apps, the same number of respondents were not familiar with online learning services at all. Fewer students possessed information about Thing Link (9 students (23,1%), Glogster (8 persons (20,5%), and other programs (less than 10%).

Thus, analyzing the second block of questions, we have made conclusions that most of the students were knowledgeable about cloud services and half of the respondents used them in their everyday lives; modern IC-technologies, in particular multimedia and mobile learning, were an integral part of modern education; the students could freely use necessary applications, which they applied in their everyday life and in their learning activities to search for information, reproduce and share it. The low level of knowledge about learning online services has drawn our attention. This suggests that students more often used traditional computer programs than online services and online resources which they used for finding and sharing information.

The third block of the questions makes it possible to define social networking activity and the sphere of using electronic resources in everyday life. So, we found out that most of the respondents were active users of social networking sites: Instagram – 29 persons (72,5%); YouTube – 28 persons (70%), Facebook – 25 persons (62,5%). To define the purposes of using the Internet resources, we found out the following: 35 participants (87,5%) used the resources of the Internet to communicate, comment and share information; 29 respondents (72,5%) – to search for information; 27 respondents (67,5%) – to support self-development and self-education; 24 respondents (60%) – to fulfill the learning tasks; 20 participants (50%) – to surf social networking sites; 15 participants (37,5%) – to play online games and to entertain. Considerably a smaller number of respondents use the Internet for designing their site, blog, or other Internet products (less than 30%) (fig. 4).

Thus, according to the results of the survey, we can assert that the concept of transmedia is new for students, but their general level of knowledge makes it possible to implement this technology in the learning process. We believe that the students surveyed more likely to use passively already existing online products on the Internet than create new content themselves. In practical activities, they prefer traditional well-known technologies and software, which is installed

on your computer (devices), to online services. The respondents are knowledgeable about where and how to search for information, as well as what to do with it. They also use their knowledge and skills for communicating, learning, and entertaining.
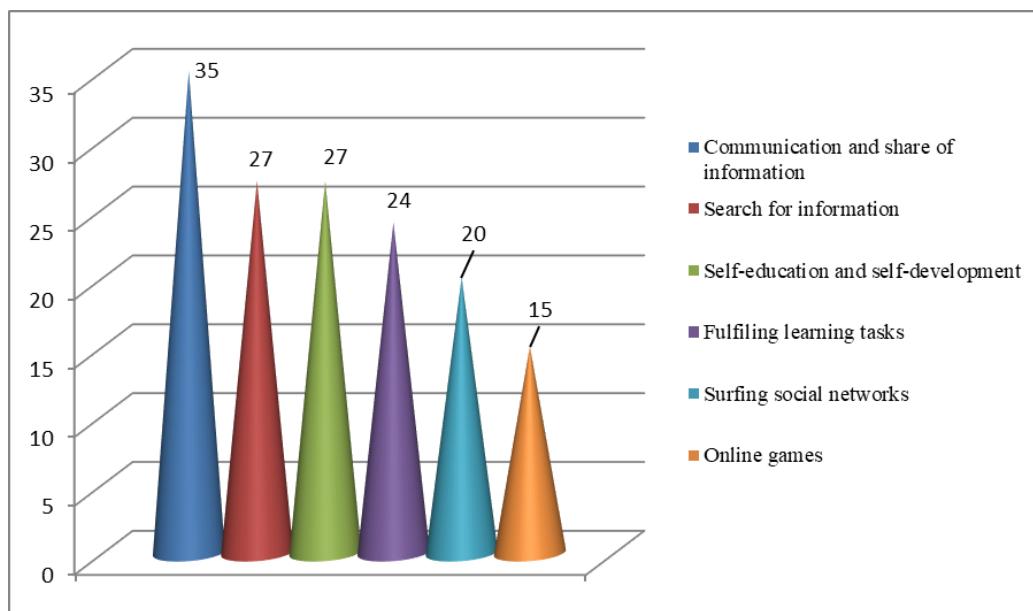

Figure 4. Purposes of using Internet resources

In the survey for university lecturers and secondary school music teachers, the respondents of different age and scientific levels took part. They were: 1 respondent (3,2%) – Doctor of Sciences, 8 persons (25,8%) – Doctors of Philosophy and 22 persons (70,1%) didn't have any science degree. According to the age indicators, 12 respondents (38,7%) were older than 50, 10 participants (32,25%) were between 36 and 50, 9 persons (29%) were between 20 and 35.

Analysis of the question about the knowledge of the transmedia technology gave such results: 18 respondents (58%) hadn't heard about "transmedia technology" before; 11 participants (35,5%) had seen this concept in the papers and conference proceedings; 2 respondents (6,4%) knew about this technology and studied this issue, and no one implemented the technology in their practical activities. 11 respondents (35,5%) correctly defined the concept "transmedia", however, in comparison with the students, quite a large number of teacher respondents (8 persons (25,8%) choose the definition that corresponded to the characteristics of multimedia technology. This makes

us think that participants of the survey were to a greater extend practicing lecturers who worked more often with multimedia while using digital tools.

Several unclear questions, which concerned transmedia technology, was quite large. So, the most difficult question was about "convergence" – 22 participants (70,9%); the concept of media platform was less incomprehensible (11 persons (35%), QR code (10 persons (32,2%), hyperlinks (9 persons (29%), content (8 persons (25,8%). Few respondents hesitated to understand the concepts of media format (6 persons (19,3%), interactive poster (5 persons (16,1%), etc. (fig. 5).
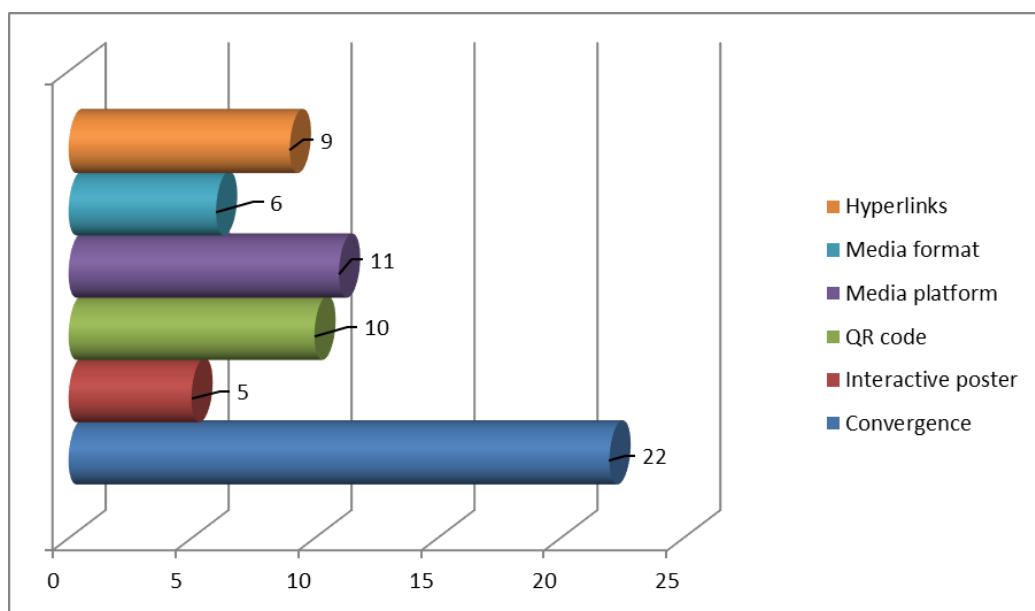

Figure 5. Unfamiliar concepts for lecturers (teachers) that concern transmedia technology

If we compare indicators of lecturers' (teachers') answers with the students' diagram with unfamiliar concepts (fig. 1), we can see that the number of concepts, which require explaining and paying attention to, is common for both categories of respondents.

Thus, according to the survey results about the theoretical knowledge of transmedia technology, we can conclude that the issue of transmedia technology is quite new and unclear for a great number of university lecturers and secondary school music teachers. A lot of concepts require explaining or correlating with practical activities.

The next range of questions gave us a clear understanding of the learning and practical use of IC-technologies in the learning process. As the survey has shown, quite a large number of respondents (17 persons (54,8%) used multimedia and blended learning technology in their practical activities; a bit fewer respondents used distance learning (14 persons (45,2%)). Few survey participants also implemented mobile learning (7 persons (22,6%) and open online courses (4 persons (12,9%). 7 respondents (22,6%) didn't use IC-technologies in their practical activities at all that was unclear, taking into account the intensive informatization of modern education (fig.6).
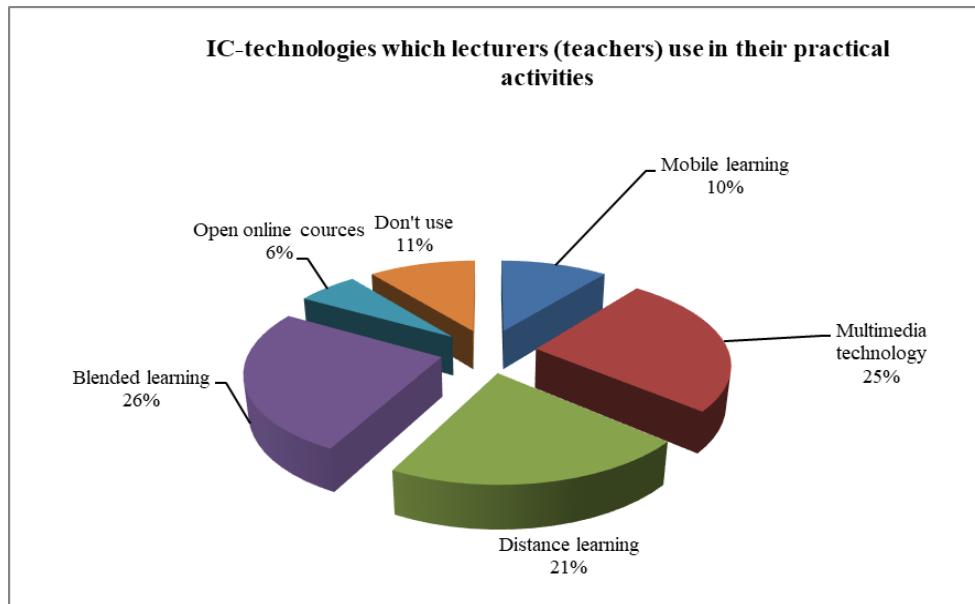

Figure 6. IC-technologies which lecturers (teachers) use in their practical activities

The most often (28 cases – 90,3%) respondents used IC-technologies to apply the e-mail resources and to search for information on the Internet. Also, a great number of survey participants (23 persons (74,2%) involved electronic multimedia textbooks into the learning process; 15 survey participants (48,4%) developed multimedia presentations; 9 respondents (29%) created interactive comics and posters. Conducting online streams and seminars (5 persons (16,1%), the use of QR-codes (6 persons (19,4%), keeping electronic journals, diaries, etc. (4 persons (12.9%) and

implementation of social network resources in scientific research (1 person (3,2%) were less popular (fig. 7).
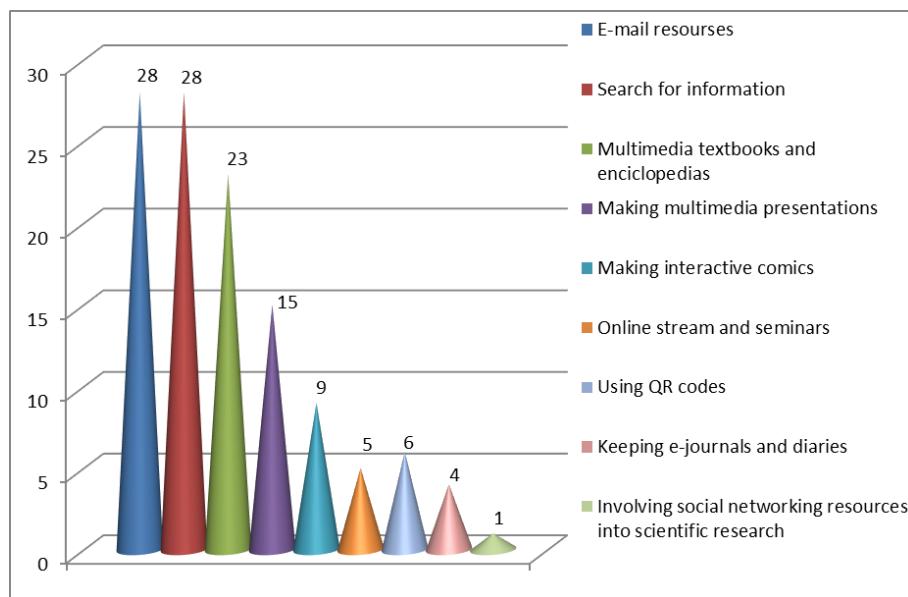
Figure 7. Ways of using Internet resources by lecturers (teachers)

The respondents actively used such software as Word (29 persons (93,5%); Power Point (20 persons (64,5 %)); Excel (15 persons (48,6%)) and Photo Shop (10 persons (32,3%)).

The survey of the use of learning on-line services showed that more than half of all respondents (17 persons (56,7%) were not interested in them at all. Learning apps (12 participants (40%), Thing Link (10 participants (33,3%), Glogster (7 participants (23,3%) were the most used among online programs. Also, the participants suggested using Mind Map, Padlet, and online resources, developed by Google, such as Google Disk, Classroom, Google Presentations, etc.

Thus, we have confirmation that the respondents are active users of IC technologies, in particular multimedia, blended, and distance learning. However, most often the respondents use ICT to find and share information on the Internet, use electronic guides and textbooks, and create their multimedia products. Fewer respondents prefer active methods of using ICT, such as an online stream, seminars, e-journals, learning materials with QR codes. We pay special attention to the fact that supporters of such types of learning activities are to a greater extent, secondary school
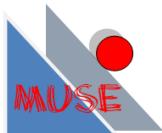
teachers. This may be explained by the implementation of the concept of the New Ukrainian School.

We should also note that participants actively used traditional system programs Word, PowerPoint, Excel. However, learning online programs and cloud services were less popular. So, only 9 respondents (29%) answered that they used cloud services in their practical activities and 4 persons (12,9%) were studying this issue. At the same time, 10 respondents were unfamiliar with this issue and didn't know any cloud services; 8 respondents (25,8%) saw them in methodological materials, but they didn't pay any attention to them. Google Disk (21 survey participants – 67,7%) was the most popular among the respondents, who used cloud services. eDisk – 7 persons (22,6%), Dropbox – 6 persons (19,4%), Microsoft Ski Drive – 3 persons (9,7%) were less popular.

So, the survey participants, who were the active users of IC-technologies, preferred traditional programs and system programs. That might be caused by the characteristics of their professional activities. The majority of survey participants were lecturers and secondary school music teachers, in particular music teachers, who used the training of performing and creative activities in their work that did not require the direct use of Internet services, including cloud services. However, it is necessary to focus on the attempts to implement new technologies in the professional activities: the use of QR codes, blended learning, cloud services, the implementation of social networking resources in scientific research, etc. Such results allow us to assert that the ICT competence of educators is improving that corresponds to the requirements of modern secondary and higher education.

According to the results, we can see that the majority of respondents were active users of social networking sites: Facebook – 23 persons (74,2%), YouTube – 19 persons (61,3%), Instagram – 11 persons (35,5%). And only 4 persons (12,9%) were not registered in any social networks. That makes us conclude that social networking sites are integrated into the everyday life of the representatives of the population that can become a significant reason for solving not only communication problems but also educational problems.

So, according to the results of the online survey "Transmedia Technology in Art Education", we can conclude that lecturers and music teachers have a certain level of knowledge about the tools
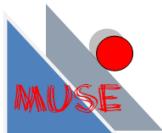
of IC-technology (they know about transmedia a little). This can be the basis for implementing transmedia technology in music teachers' professional training.

5. Discussion

The phenomenon of using transmedia technology in music teachers' training is poorly represented in researches of Ukrainian educators and it has been started implemented in foreign teaching practice by Jenkins (2003) and Scolarli (2016) over the last decade. However, some scientists confirm the possibility and significance of implementing transmedia technology in different spheres of human activities while conducting their research.

So, Fleming (2013), a library media specialist, discloses the concept Transmedia Learning World (TLW). The author emphasizes that transmedia technology makes it possible to combine the benefits of digital technology and traditional teaching techniques in education that contributes to getting a deep and powerful learning experience. Modern trends in education make schools study the opportunities of digital learning more carefully, encouraging significant changes in pedagogical thinking and practice. The use of transmedia methods, in particular the recognition of the Transmedia Learning World concept, gives a teacher tools that allow paying attention to each child. Transmedia methods provide the use of the collective intelligence of students who focus on their own pace and learning type. Transmedia technology immerses teachers and students in the rich virtual and physical environment that facilitates students' real emotional interaction with the learning process.

Fleming (2013) concludes that learning technologies have gained new results. We agree with the statement that teachers have broad access to high-quality digital content which allows students to demonstrate their knowledge and skills in exciting and interesting ways. Students' successful professional training requires the transition from teacher-centered learning to student-centered practice. Students learn better if education reproduces their own choice, selecting tools and information from different sources. The transmedia learning model creates new tasks and requires a broad and qualitative mastering of media literacy skills to correspond to competency-based requirements of the digital era. The use of transmedia methodology, according to the scientists'' opinion, can contribute to the development of professional education. The content, which is located
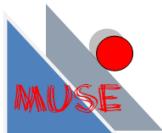
on different media platforms, enables the achievement of high results of every student regardless of their initial level.

Martinez, Atienza & Zamora (2018) pay special attention to the use of transmedia technology in "hyperlinked society" in university students' professional education. The paper authors have conducted research among the university students in the sphere of social education for defining the role that transmedia content plays in cultural and social development. They reasonably note that the need to develop a culture of convergence and transmedia literacy is becoming a key challenge in education institutions. The scientists say that learning results at universities have improved after the implementation of transmedia learning content which has been created by students. It is important to conclude that the correlation of transmedia literacy with developing public position and learning through creative experiments plays an important role in professional education and development of students' social position.

Castells & Illera (2018) also emphasize the positive learning results that are gained due to the implementation of the transmedia approach to education, compared with other approaches, in particular with the context-based approach. The scientists support the idea of the transmedia organization of the learning process, based on Jenkins's definition of the benefit of combining different media at different times on different platforms to immerse the user in a new situation and motivate them to understand the learning topic.

After implementing the project "Ancestors' Letter", developed for 15-year-old students, the scientists concluded that the transmedia-based approach contributes to the deeper awareness of effective coordination between the curricular and extracurricular settings, between digital institutions and everyday life, both in terms of content location and dissemination.

Perez-Manzano & Almela-Baeza (2018) promote a hypothesis about the usefulness of combining transmedia with gamification for encouraging teenagers to a scientific career. The scientists disclose the issue of using digital programs in learning and teaching activities. They say that digital games (DGBL) have powerful educational potential and reveal new prospects in the sphere of education. The scientists prove the credibility of this statement based on designing the gaming web-site, developed especially on the gaming basis, and supplemented with transmedia resources. The web-site operations are aimed at the development and improvement of both
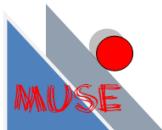
scientific and technological professional achievements of teenagers in the period of forming their career preferences. The research results allow us to assume a high level of implementation efficiency of such projects. The authors record the significant increase of the interest in scientific professions and research activities, as well as an understanding of their social advantages. This confirms the students' positive attitude toward scientific knowledge and skills. It is possible to gain high results of students' motivation for scientific career preferences together with technological and the specific components of the project due to getting acquainted with real cases of scientific and research activity and covering successful scientific achievements and attitudes.

As the scientific findings prove, the elements of transmedia technology are used in different directions of scientific activities, including the development of ethical skills, professional skills, students' language skills, etc. Within the new European Higher Educational Area (EHEA), Sotelo (2018) studies the issue of opportunities that digital technologies give to improve the development of critical thinking skills, ethics and to actively involve university students into the contemporary debate. The scientist draws attention to the digital posters (infographics) and transmedia storytelling (the scientist defines it as a 3-minute video intermediation format) as new forms of communication and self-expression among teenagers. To develop university students' critical thinking and ethical skills, in 2016 the interdisciplinary innovative project "New Narrative for Europe Project from the Humanities" (https://www.ucm.es/siim/new-narratives-for-europe) was launched (the project is currently closed). In this project the current crisis state of ethical values is highlighted through media-digital content:

1) the development of opposing thoughts and use of reliable resources to substantiate their thoughts (result – infographics);

2) the development of problem-solving skills with the results of creating interartistic video with elements of transmedia technology (3-5 minutes) with the proposition of social activity for the common good in the European context.

Scolari (2016) succeeds in his research and pays attention to the fact that it's not easy to implement transmedia technology in education. We should emphasize the development of teenagers' transmedia literacy, which plays an important role in the implementation of the transmedia technology in education. Internet skills and transmedia literacy, which is called an
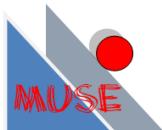
absolutely new approach that regards a subject as a user (producer + user), but not as a passive and estranged user. While traditional media literacy focuses on books and television, transmedia literacy puts digital networks and interactive media experiences in the center of its analytical and practical experience. Scolari (2018) together with his team of scientists has researched for gaining a better understanding and analyzing of how teenagers use transmedia skills in informal education. The research team has presented a comprehensive description of the main transmedia skills that young people should possess. The result of the research is represented as a map of transmedia skills, which include playback, judgments (analysis), transmedia navigation, networking, and communication components. The research covers a significant result list: from specifically technological skills to skills that concern ideological and aesthetic manifestations.

Transmedia skills range from video game problem solving to producing and sharing content in the context of web platforms and social networking sites; developing, producing, sharing, and critically consuming the narrative content are also parts of transmedia competence.

The scientist makes an important conclusion that as a result of the accelerated pace of technological evolution and rapid changes in the media environment transmedia skills and learning strategies need periodic updating. In any case, the most relevant issue is the reduction of the distance between the formal learning environment and the extremely active "digital life" of teenagers on social networking sites and the Internet (Scolari, 2018a).

However, the search for scientific publications that highlight the experience of using transmedia technology in music teachers' professional training did not produce successful results, we can find confirmation of the continued influence of transmedia on the development of contemporary artistic trends, including music. Haamer (2020) asserts that the increase in popularity of the Internet and mobile devices causes the prevailing interest in digital music (IFPI Digital Music Report). Havrilova, Ishutina, Zamorotska, & Kassim (2019) substantiate the use of electronic Internet resources and multimedia tools for developing the distance courses of music teachers' professional training. The scientists consider these resources as new forms and methods that allow combining different art types that are a crucial issue for contemporary artistic pedagogy.

Music is widely used and no longer plays the role of sound history: it is used in movies (Flaming Lips, Kanye West), becomes a game (Jay-Z), it is released as a series of applications
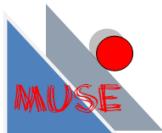
(Björk), it becomes virtual reality (Gorillaz), etc. The phenomenon of digital music culture, used in all mass media, is looking for its audience. And there is only one question if a person has time to perceive this content. The entertainment industries compete with one another, so it needs to be unique and admirable (Haamer, 2020).

6. Conclusions

Thus, based on the results of the research and analysis of scientific theoretical findings, we can conclude that the transmedia technology is at its initial stage, however, it is steadily gaining ground in national science. After analyzing the opportunities, given by transmedia technologies for professional activities in the modern world, we can say that currently there is no experience of using transmedia technology in the sphere of music teachers' professional training. However, there is a wide range of documented cases of transmedia strategy in educational activities that make it possible to suppose that the implementation of the transmedia technology in learning the art subjects, in the integrated course "Art", is very useful. We assume that the implementation of the transmedia strategy in music teachers' professional training contributes to the qualitative development of their professional competence, the broadening of outlook, the development of artistic skills, and professional qualities.

The research has shown that the levels of students', lecturers', and secondary school music teachers' digital knowledge and IC skills are rather high. The teachers master digital technologies and Internet services and use them in their learning, professional and everyday activities. The respondents are knowledgeable about the issues of IC technologies and cloud services, they master computer programs and know about online services and programs (but due to the low level of knowledge this issue requires more attention). Also, the respondents are active users of social networking sites, they use ICT-technologies in their practical activities and everyday life to obtain new knowledge, to fulfill and solve the tasks, to get and share the information, and to communicate. This enables and makes meaningful the introduction of transmedia technology into the music teachers' professional training.
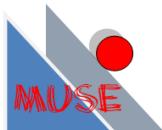
As the concept of transmedia technology hasn't applied to the art education yet and the opportunities of its implementation in practical and creative activities haven't been realized, we think it is necessary to implement a special course "Transmedia Technology in Music Education" for music teachers' professional training or to introduce a separate module "Using Transmedia Technology in Music and Educational Activities" into the syllabus of the course "Methodology of Teaching Music".

It is feasible to divide the course Transmedia Technology in Music Education" into three content blocks that disclose the general definition of transmedia technology, technic, and technological features of using transmedia technology in music art and the possibilities of implementing the transmedia technology in the course "Music Art" in primary school. The purpose of studying the special course is to reveal the content of the concept "transmedia technology", to gain the deeper understanding of the transmedia world in the context of musical art, to facilitate the understanding of the identification of patterns and contexts of using transmedia technology, to disclose the contextual links when using media platforms, to involve students into transmedia projects.

Conflicts of Interest: The authors declare no conflict of interest.

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