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## FOSTERING DIGITAL COMPETENCIES IN PROSPECTIVE MUSEUM SPECIALISTS: EUROPEAN EXPERTISE AND PRACTICE OF UKRAINE

**Abstract.** The article analyses the stages of implementation of European standards for digitalisation of museum space in Ukraine, with due regard for EU regulations and

European best practices in the development of digital competences in museum specialists. We have found that the major problem of creating a digital collection of Ukrainian historical and cultural heritage is the lack of skills and capabilities of specialists in digitising museum collections and working with data. For adaptation and effective functioning in the variable field of digital culture, taking into consideration the best practices of European universities, we suggest to develop and implement a micro-programme 'Digitalisation of Cultural Heritage' in higher education institutions to foster skills in digitalisation of tangible cultural heritage in students of historical and artistic specialties of universities using digital technologies, which will be consonant with the digital society focused on the development of required key competencies and facilitate the integration of digital technologies in education. We have found that digital competences involve confident and critical use of modern technologies through the acquisition of skills in information and media literacy, communication and collaboration, and the creation of high-quality digital content. This will allow museum specialists to contribute to the development of cultural institutions by introducing these technologies into museum practice. European expertise proves that museum staff should develop and upgrade their digital competencies through training and educational es.

**Keywords:** digital culture; European expertise; digital competencies; museum space; university; micro-programme; specialist.

## 1. INTRODUCTION

**Problem statement.** In the early 2000s, Charlie Gere, Professor of Media Theory and History at the Lancaster Institute for Contemporary Arts, University of Lancaster, introduced the concept of 'digital culture' into scholarly discourse, which marked a new understanding of the essence of culture as a socio-anthropological reality, the content of which is not limited to the instrumentality of information and computer technologies [1, p. 49]. Two approaches to interpreting digital culture soon emerged: the transhumanist and the humanitarian. According to the former, the main purpose of a person is to develop new technological forms, and according to the latter, to transform oneself into a 'digital culture person' in accordance with the requirements of the new communication technologies [2, p. 16]. Furthermore, this concept refers to the recognition of digital technologies as an effective means of presenting the collections of libraries, museums and historical parks, and the 'digital future' is recognised as one of the key priorities of the Strategic Plan (2022–2028) of the International Council of Museums (hereafter referred to as ICOM) [3]. Therefore, there is no doubt that the study of digital museum culture and the mechanisms of using these technologies is important for the academic, educational and cultural development of Ukraine, and contributes to the implementation of European standards in museum practice.

**Analysis of the latest research and publications.** P. Herchanivska [4], V. Dechonh [2], O. Yatsenko [1] analysed the specific aspects and ways of conceptualising digital culture, and M. Kulyniak described the phenomenon of digital cultural heritage [5]. V. Oryshchuk summarised the French expertise in digital development of museums and the possibilities of its implementation in the Ukrainian museum space [6], S. Hololobov, L. Antonova [7] and A. Kozhyna [8] defined the prospects for implementing the state policy of digital development in the museums. Specific aspects of fostering digital skills in museum staff in the Great Britain were analysed by S. Malde, A. Kennedy and R. Parry [9], and the implementation of European best practices in the development of digital competencies in the context of higher education institutions was studied by O. Yershova [10], S. Sysoieva [11] and N. Bakhmat [12].

The development of digital competencies in museum specialists in Ukraine is still an insufficiently investigated issue, as most authors focus on the implementation of the state digitalisation policy, and do not highlight taking advantage of the European experience in the development of digital competencies in the educational space of universities.

## 2. AIM AND TASKS

**The article aims** to determine the possibilities of introducing European best practices in the development of digital competencies in museum specialists into the educational space of higher education institutions (hereinafter referred to as HEIs).

**Research tasks** are to clarify the concept of 'digital culture'; to analyse the European best practices in developing digital competences; to make recommendations to executive authorities on methods of integrating into the global cultural space; to identify the key focus areas of developing digital competences in prospective museum specialists during their training in art and history at Ukrainian universities.

## 3. RESEARCH METHODOLOGY

The research methodology is based on the application of a number of methods: historical and cultural, analytical and synthetic, and comparative analysis.

## 4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

Today, digitalisation has become an integral part of all social changes, so there is a need to develop a new social type of a digital culture person – creative, focused on the digital format of information perception, able to adapt to the dynamic transformation of the media space [4, p. 5]. In response to the challenges of our time, the European Parliament and the Council of the European Union adopted the updated version of the Reference Framework of Key Competencies for Lifelong Learning (2018), which recognises digital competence as one of the key competences and provides for the confident, critical and responsible use and interaction with digital technologies in learning, work and social life. In 2021, the Ministry of Digital Transformation of

Ukraine presented the Digital Competence Framework, based on the guidelines of European and international institutions with respect to digital competences [10, p. 292]. The following year, in accordance with the implementation of the EU's Digital Europe Programme (2021–2027) in Ukraine, the Verkhovna Rada of Ukraine adopted the Resolution 'On Approval of the Objectives of the National Informatisation Programme for 2022-2024' [13]. The Ukrainian government's action plan in the area of culture provided for the creation of an electronic information resource of cultural heritage and cultural artefacts, and the introduction of an electronic system of the Museum Fund of Ukraine [14]. In particular, one of the objectives of the Ministry of Culture and Information Policy (hereinafter referred as MCIP) was to create, introduce and maintain electronic registers in the area of culture, which aimed to facilitate Ukraine's full-fledged integration into the European cultural space. The implementation of these objectives involves a range of activities aimed at replacing the model of working with information on tangible cultural heritage and cultural artefacts, with due regard for European standards and international best practices [7, p. 52]. In particular, by digitising museum collections, the French government aimed to make them accessible to a wide range of users and create a platform for the development of educational and research sector. For this purpose, they developed annual digitalisation plans, the implementation of which was entrusted to the French Ministry of Culture and the Ministry of Higher Education and Research, which funded relevant projects and provided equipment and access to national digital databases [6, p. 767].

One of the first steps of the Ukrainian government was the introduction of the CIDOC (International Committee for Documentation, ICOM) standard [15] to represent the information on heritage and museum documentation, which is used to develop the European digital infrastructure of cultural heritage, aggregate data and provide the functioning of international digital resources. With the support of the European Commission, a centralised database was created on the basis of CIDOC - the Europeana digital library, the collection of which includes about 50 million works of art and historical documents from the collections of more than 3,000 cultural institutions in Europe, which are publicly accessible to be used in research, educational and outreach activities [5, p. 220]. In 2011, to implement this project, CIDOC organised training for museum staff at European universities through workshops, summer schools, and online courses. For example, in August 2018, the University of Tartu (Estonia) implemented the Digital Cultural Heritage programme aimed at fostering digital competencies in the museum staff who acquired the necessary knowledge and practical skills to solve issues and implement the principles of digital content management [15].

In order to create favourable conditions for the integration of the Ukrainian culture into the world cultural space, the government adopted the decision to establish the Ukrainian Cultural Foundation [16]. The latter supported the initiative of the Ukrainian Centre for Museum Development NGO to develop the DigiLab.Promuseum platform (2018) in order to create an electronic resource of cultural heritage and cultural artefacts. The project was aimed at enhancing the competencies of Ukrainian museum specialists and creating a network for the introduction and development of electronic collection management standards. The project provided for the operation of a specialised web platform as a tool for co-operation between

specialists to develop and publish electronic unified thesauri and authority files, improve metadata schemes, and so on. This web platform was also intended to facilitate the publication of guidance materials, knowledge-sharing outreach and exchange of best practices, presentation of successful practical cases and applied tools [17]. In 2020, The National Committee of the International Council of Museums (ICOM Ukraine), in cooperation with the Ukrainian Cultural Foundation, launched the operation of the Ukrainian CIDOC branch. Its primary objective was to introduce European museum standards in Ukraine, adapt and implement training programmes, meet and establish co-operation with foreign colleagues, which aimed to facilitate the integration of Ukrainian museum specialists into the working bodies of the International Committee for Documentation.

However, according to the findings of a survey of Ukrainian museum and archival institutions conducted in 2023, over half of the respondents did not have digitised collections [18]. The respondents stated that among the problems hindering the digitisation of museum collections were the security of data storage and servers; researchers' copyright on unpublished materials; absence of a unified database of museum collections, standards for describing and exchanging data, synchronisation with MCIP programmes; lack of skills of museum and library staff in digitisation and further work with data [19, p. 24].

Therefore, among the key challenges to digitising museum and archival collections in Ukraine the respondents highlighted a lack of funding, special equipment and qualified staff. It turned out that the museum staff did not have the skills to digitise collections and work with them further due to the lack of qualifications to meet current requirements; there were shortcomings in professional development programmes; professional development seminars were conducted as formal briefings and classroom sessions; and no attention was paid to multidisciplinarity through the perspective of collections preservation. Besides, according to researchers, non-formal education in museology is hardly developing due to the lack of funds, and the educational programmes of higher education institutions do not meet the expectations of stakeholders in terms of relevant and necessary content, learning and teaching [19, p. 26].

According to the European Strategy for Universities, higher education institutions play a fundamental role in developing the digital competence of prospective specialists [20]. For example, at the Berlin University of Technology and Economics, students of the 'Museum Studies' bachelor's degree programme study courses such as 'Databases', 'Digital Media', 'Modern Technologies', 'Digitalisation Strategies' aimed at digitalising museum collections. During laboratory practicals, they use professional software (Adlib Archive and Museum, easy DB, Faust, FirstRumos, imdasPro, MuseumPlus) and acquire knowledge and practical skills in working with modern museum databases, create interactive museum exhibitions. Apart from that, German museums provide public access to their digital collections and allow students to use them in developing their own interactive projects [21]. We believe that the best practices of German universities and museums should be implemented in the Ukrainian system of training museum specialists.

Today, eight Ukrainian universities train specialists in the speciality 027 'Museum Studies, Monument Studies' of the first (bachelor's) level of higher education. Their educational programmes have been developed in accordance with the Standard approved by the Order of the Ministry of Education and Science of Ukraine of 24 April 2019. It provides for the list of general competences to include 'skills in the use of information and communication technologies' [22, p. 6]. The programme outcomes of the standard state that the prospective specialists should 'apply information and computer technologies in professional activities' and 'make verbal presentations with visual support, electronic presentations, video presentations, written presentations in the state and foreign languages' [22, p. 9]. According to the standard, students of the educational and professional programme 'Museum, Monument Protection Activities and Cultural Tourism' at Lviv Polytechnic National University foster their digital competences only when studying the educational component of the general training course, that is 'Fundamentals of Information Technology' [23], and students of 'Museology and Monument Studies' course at Taras Shevchenko National University of Kyiv study 'Modern Information Technologies in Museology, and Monument Studies' presented as lectures and practical classes with no IT laboratories and relevant software provided [24].

Apart from that, since 2022, the Kharkiv State Academy of Culture (subordinated to the MCIP) has been training specialists in the 'Digital Museum Industries' educational programme to develop the necessary system of professional knowledge and special competencies in the digitalisation and virtualisation of the museum space: the ability to develop and produce digital technologies, ensure the effective use and promotion of virtual technologies, and identify and design areas of digital development in the museology and monument protection sector. The development of these competences is ensured by the educational components of professional and practical training, such as 'Multimedia Technologies in Exhibition Activities', 'IT Technologies in Museum Activities', 'Digitalisation of the Museum Environment', etc. [25]. The Academy collaborates with local and regional museums, and students are involved in the development of practical projects related to the digitalisation of cultural heritage, the development of audio guides, the creation of virtual tours, and so on [26]. We believe that this educational programme (practically the only one in Ukrainian universities) is unable to solve a number of issues in the development of digital competences in museum specialists.

For adaptation and effective functioning in the variable area of digital culture, with due regard for the best practices of European universities, we consider it expedient to develop and implement in HEIs the micro-programme 'Digitalisation of Cultural Heritage' (3-5 ECTS credits), which is consonant with the digital society focusing on the development of required key competences, and will facilitate the integration of digital technologies in educational space [11, pp. 8-9]. As part of the micro-programme, we suggest the following educational components: 'Digital Archives and Databases', 'Digital Technologies in Museum Studies', 'Use and Protection of Digital Works', which will be provided by several university departments.

When developing such educational micro-programmes, we should keep in mind that the fourth industrial revolution has contributed to the digital transformation of museums, in particular, the use of modern technologies to preserve, study and promote collections on

electronic platforms and websites. Innovative technologies in museums have changed the traditional 'look-but-don't-touch' approach to interactive experiences. The latest technologies (virtual reality (VR), augmented reality (AR), interactive touch screens) allow museum visitors to explore the exhibits on display. The use of artificial intelligence technology (hereinafter referred to as AI) in museums promotes the cognitive activity and attracts an even larger audience due to unusual formats of work [27, p. 196]. However, this innovation was a challenge for museum staff, who were unready to implement global trends and digital technologies. It was primarily due to the insufficient level of the museum staff's training in working with the global digital environment and the use of only traditional teaching methods in HEIs aimed at acquiring mainly theoretical knowledge in the disciplines dedicated to museums and cultural monuments. Therefore, educational institutions should primarily focus on the digitalisation of the educational process and fostering digital competencies (including the concepts of information and media literacy, communication and collaboration, digital content creation, security, ability to solve diverse issues, lifelong learning [28]) in students, which are among the key ones nowadays [29]. In particular, it is advisable that prospective museum specialists gain insight into various aspects of digitalisation and acquire professional skills in using digital technologies in practical terms [12].

According to the current Digital Competence Framework, a number of digital competencies are required to work in museums (Fig. 1) [28]. *Digital literacy* determines the ability of a specialist to effectively use operating systems, have skills in working with standard office software and graphics applications, specialised electronic platforms and websites, and use data input/output devices (scanner/printer, digital camera, document camera).
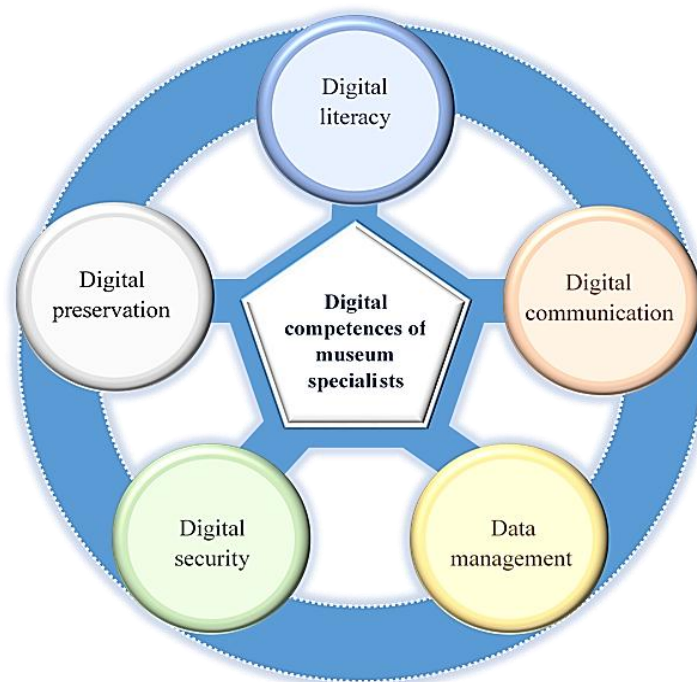


**Fig. 1.** *Components of digital competences of museum specialists*

*Digital communication* is considered the ability of a museum specialist to work with email, social media and platforms, messengers and video conferencing applications, with the obligatory observance of digital etiquette rules for effective work and communication with the audience through digital communication channels.

*Data management* defines the ability to collect, process and analyse data (photographs, reproductions, documents, etc.) and publish them on subject-related electronic platforms or their own database.

The basis of *digital security* lies in the understanding of the cyber security essentials, which includes the ability to protect personal data, recognise online fraud, avoid potential cyber threats, and use anti-virus software.

Museum specialists should know the methods and techniques of *digital preservation* (photo archives, 3D objects). The basic principles of developing the elements of this competence in museum specialists are personalised approach that means focusing on a person, not on the organisation or technology; goal commitment that is a clearly defined goal of fostering skills in museum workers in accordance with the concept of museums and their objectives; dynamism, that means sensitivity, flexibility and ability to adapt to different contexts in the museum sector; proactive attitude, that is the ability to act and change [9, p. 20].

The professional training of museum specialists within the scope of the micro-programme may provide theoretical knowledge and practical skills in the digital environment to students of historical and artistic specialities at museums of educational institutions. It is essential for museum specialists to quickly adjust to new information and communication technologies, to be able to effectively interact with different audiences through modern digital platforms, which will allow recent graduates to be competitive, find new opportunities for career development, and influence the development of cultural institutions through the integration of technology into museum practice. Apart from that, the museum specialists should constantly develop and upgrade their digital competencies, analyse their own digital activity, and assess their prospects for development in terms of effective use of the latest technologies to attract visitors, manage collections, and make cultural heritage accessible to a wider audience. In order to upgrade their knowledge and skills, they should take refresher courses at least once every three years, take part in research workshops, webinars, and applied research conferences.

## 5. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

Today, museums play an important role in preserving and promoting historical and cultural heritage. Digitalisation of museum collections in European countries has become one of their top priorities. To ensure Ukraine's effective integration into the European digital cultural space, it is necessary to take into consideration the best practices of leading European countries in implementing digital technologies in the museum sector. In particular, the recording of data in electronic format and its unified exchange, ensuring wide access to open data in the area of protection of cultural heritage and cultural artefacts. Since one of the problems of the effective implementation of the latter is the unreadiness of museum workers for these processes, we

suggest to focus on the fostering of digital competencies in the training of specialists in history and art in higher education institutions within the scope of the micro-programme 'Digitalisation of Cultural Heritage', which is consonant with the digital society focusing on the development of required key competencies, and will facilitate the integration of digital technologies into educational space.

**Prospects for further research** provide for defining the ways to foster digital competencies in prospective museum specialists in the educational space of HEIs.

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# ФОРМУВАННЯ ЦИФРОВИХ КОМПЕТЕНТНОСТЕЙ МАЙБУТНІХ ФАХІВЦІВ МУЗЕЙНОЇ СПРАВИ: ЄВРОПЕЙСЬКИЙ ДОСВІД ТА ПРАКТИКА УКРАЇНИ

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**Анотація.** У статті проаналізовано етапи впровадження європейських стандартів цифровізації музейного простору в Україні із врахуванням нормативно-правових актів ЄС та європейського досвіду формування цифрової компетентності у фахівців музейної сфери. З'ясовано, що основною проблемою створення цифрової колекції вітчизняної історико-культурної спадщини є відсутність у фахівців вмінь і навичок

роботи з оцифрування музейних колекцій й роботи з даними. Для адаптації та ефективного функціонування у варіативному полі цифрової культури, із врахуванням досвіду європейських університетів, пропонується розробити і запровадити в закладах вищої освіти мікропрограму «Цифровізація культурної спадщини», для формування навичок з цифровізації об'єктів культурної спадщини у здобувачів історичних і мистецьких спеціальностей університетів засобами цифрових технологій, що відповідатиме цифровому суспільству орієнтованому на розвиток затребуваних ключових компетентностей та сприятиме інтеграції цифрових технологій в освіту. З'ясовано, що цифрова компетентність передбачає впевнене і критичне використання сучасних технологій через набуття вмінь і навичок з інформаційної та медіаграмотності, комунікації та співпраці, створення якісного цифрового контенту. Це дозволить фахівцям музейної справи сприяти розвитку культурних установ шляхом впровадження цих технологій у музейну практику. Європейський досвід підтверджує, що працівники музеїв повинні розвивати і підвищувати набуті цифрові компетентності на тренінгах і навчальних мікропрограмах.

**Ключові слова:** цифрова культура; європейський досвід; цифрові компетентності; музейний простір; університет; мікропрограма; фахівець.

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