

# VIRTUAL MUSEUMS USING IN THE PROCESS OF TOURISM DISCIPLINES STUDYING

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significance; it is a kind of a test of the level of professionally-oriented knowledge, professional skills, general and special competencies, creativity etc. In our opinion, the reception of visualization is especially expedient and effective in the process of tourism students teaching, who are most connected with excursion activities, which are aimed at getting acquainted with various tourism objects, in particular, museums. Virtual museums and tours are the technologies that provide dynamic forms of learning and help to update the teaching methodology. In general, the virtualization of the educational space of Ukraine will ensure the continuity of full-time, distance and blended learning.

Virtual museums and virtual tours (in a specific way, these concepts are inseparable, because the main reason for creating a virtual museum is the need for a virtual tour), which, by the way, the quarantine regime has made a trend in social networks and other resources, can be considered the latest phenomenon. Their appearance has opened, in particular, new opportunities for virtual tourism and future professionals' teaching. Virtual museums provide an opportunity to diversify individual classes and the learning process as a whole formally (methodologically) and due to the content.

Today, virtual museums are an important object of scientific study. However, the virtual museum, as a new cultural form of integration that exists on the Internet and is not the result of the modernization of the past cultural form, cannot be identified with the site of a traditional museum. Virtual museums are characterized by three basic features: presence in the global network (this is a necessary condition for the existence of a virtual museum, the presence or absence of a «physical» museum is not essential); the presence of a cultural product that represents the mode of past (memory), present and future and addressing a wide audience (MAKSIMOVA, 2012).

## INTRODUCTION

The latest educational technologies have proved to be extremely relevant in a pandemic situation, when higher educational institutions are forced to conduct the distance learning and complete it. It is a special challenge for the tourism as a profession, as it can have significant negative consequences: the tourism business has suffered a catastrophe that will affect not only this industry as an economic sector, but also the development of tourism as a broad field. Virtual teaching with an emphasis on virtual presence at virtual objects, which in fact involves active physical movement in real space, is a kind of overriding task for tourism teachers and students.

Today, information and communication educational systems occupy a prominent place, having a powerful potential and long-term prospects for development and implementation in the educational process. It is well known that the information presented visually is better assimilated and memorized, in connection with which the expediency is substantiated and the popularity of its visualization in the educational process grows. In modern conditions, the task of visual presentation of information in the educational process of tourism students acquires special

At the same time, in the educational space, virtual museums are a technology that allows to expand the possibilities of traditional and e-Learning. Being a tool for preserving historical and cultural heritage, a current artistic and cultural phenomenon of today, a virtual museum, allowing to visit any museum, architectural masterpiece, etc., as an educational technology makes education accessible to all including the poor, people with disabilities and others. (PODLINYAEVA, 2016).

Analysis of works of foreign scholars shows that virtual museums are studied in two aspects: the first involves the study of new methods and tools for creating virtual museums, their types, advantages and disadvantages for the functioning of virtual museum space as a cultural and artistic environment, storage of cultural information (CHIARENZA et al., 2019), (MEIER et al. 2020), (GHANIL et al., 2020), (ISLEK et al., 2019), (RAHIMI et al., 2018), (YIP, 2018); the second involves the analysis of the educational potential of virtual museums and its implementation (SERIO et al., 2013; AKÇAYIR et al., 2017; ATAMURATOV, 2020). In our opinion, the study of L. Daniela is the most detailed. The results of her research show that most virtual museum developers pay attention mainly to technical characteristics and information architecture, rather than the educational value of the material, which increases the role of the teacher in the use of virtual museums for learning (DANIELA, 2020). R. Yung and C. Khoo-Lattimore (2017) conducted the research on new aspects of virtual and augmented reality in the study of tourism. Researchers from Saudi Arabia decisively prove the effectiveness of the interactive virtual museum method for studying cultural heritage (ISMAEEL et al., 2016). However, due to the fact that virtual museums are increasingly used in education, a number of important issues for the theory and practice of vocational tourism education in the use of virtual museums in the educational process requires special detailed analysis.

The purpose of the article is to identify and to analyze aspects of the use of virtual museum technologies in tourism studying in the context of the latest modern educational information and communication technologies.

## METHODS

For the theoretical part of the virtual museums research, in the process of its organizing and conducting within information and educational environment of tourism disciplines, such methods as analysis, synthesis, systematization and generalization of works of Ukrainian and foreign scientists have been used; for empirical part a survey (questionnaire) of students studying tourism disciplines has been performed.

## RESULTS AND DISCUSSION

New challenges of time lead to the development of new teaching forms and methods. In the process of tourism disciplines studying, modern techniques are actively used, in particular, the technology of a virtual museum, a virtual tour, virtual tours, etc. The teacher can choose different forms and methods of work with the use of museum resources: to conduct a sightseeing and thematic virtual tour; to use multimedia resources of the museum site to create an electronic database of visual aids; to organize practical work of students in the classroom with virtual images of museum exhibits; to involve applicants for higher education in the use of information resources of the museum in the process of research work performing.

Delivering lectures, the teacher has the opportunity to conduct virtual tours for future tourism professionals to the best museums and galleries in the world using tools from various platforms (Google Arts & Culture, Google Cultural Institute, etc.), select specific paintings from the catalog, etc. on the topic of the lesson and show their fragments in high resolution. Virtual tours are one of the most effective and convincing ways to present information, as they create the illusion of full presence. In fact, it is a multimedia photo panorama in which you can place videos, graphics, text and links. At the same time, unlike a video or a regular series of photos, virtual tours are characterized by their interactivity. During the trip you can zoom in or out an object, thoroughly examine the individual details of the interior, view the panorama from afar, look up and down, get closer to the selected point or leave it, move through the hotspots from one panorama to another, for example, to walk in separate rooms, and all this can be done at the necessary pace and in the order convenient for the concrete spectator. Thus, you can, for example, go around the whole museum from the inside, see it from the outside or make a

virtual trip to an exotic island without leaving the audience. These are invaluable opportunities for improving modern teaching in universities in conditions of financial deficit. Modern technologies open wide opportunities for the organization of virtual interactive presentations and exhibitions, which are used in teaching students.

The use of virtual tours is an effective form not only of the teaching process, but also of the studying process as well. It is firstly due to the needs of teachers themselves in a more modern presentation of information; secondly, the desire of students to get acquainted with culture and art of different countries, despite the code; thirdly, the progressive use of the capabilities of information and communications technology (ICT).

Virtual tours are used by in different versions: as a part of the lecture, when the teacher illustrates the research material with the help of a virtual museum; as part of a class in tourism, when students receive a specific task of creating a virtual trip; as a form of organization of research work of students being done individually and without teacher's help, aimed at in-depth study of a topic. Virtual tours can be used in various classes in fragments or as a series of classes on specific topics. For example, while learning the discipline «Museology» («Museum Studies») a virtual tour of the Louvre, one of the world's oldest, richest, and largest museums, a repository of the treasures of ancient civilizations, and a symbol of Paris and France is being offered.

In the limited time fixed in the curriculum to view the tour, the teacher offers students as a task for independent work acquaintance and analysis of virtual tours of museums and online exhibitions (The Byzantine and Christian Museum (Athens, Greece), Cranbrook Art Museum (Michigan, the USA), Dali Theater-Museum (Catalonia, Spain), The Frick Collection (Pittsburgh, Pennsylvania, the USA), The Hallwyl Museum (Stockholm, Sweden), the Hermitage Museum (St. Petersburg, Russia); the Louvre Museum (Paris, France), Marshall M. Fredericks Sculpture Museum (Michigan, the USA), Pitt Rivers Museum (Oxford, the UK), São Paulo Museum of Art (Sao Paulo, Brazil); Vatican Museums (Vatican); Vizcaya Museum & Gardens (Miami, Florida, the USA)). Each student, choosing the museum that interests him the most, presents it in a class and analyzes the quality of the virtual tour.

In the process of organizing museum and educational activities, virtual resources create unique conditions for getting acquainted with museum collections and infrastructure, performing various tasks, preparing for a real visit to the museum. For the teacher, virtual museums provide a significant amount of educational multimedia materials, promote the development of new teaching methods and provide an opportunity to communicate fully with their students, as well as diagnose student performance and study their cognitive interests. When solving creative tasks with the use of virtual museums promotes the development of learning skills: selection of information, respectively, with a specific purpose and theme; public presentation of the results of works; compilation of comparative analysis; monitoring and grouping of information.

Here is a short list of virtual tours of Ukrainian museums that we use in tourism classes: The Ulas Samchuk Memorial Museum, Museum of Hetmanship, National Museum of Hutsulshchyna and Pokuttia Folk Arts, Viacheslav Lypynskyi Memorial Museum in the village Zaturtsi, Center of Study of Inheritance of Ostroh Academy, Chornobyl National Museum, Mykhailo Dzyndra Museum of Modern Art in Lviv, Jurii Mykolskyi Liberation Struggle Museum, Glass Museum in Lviv, Volyn Icon Museum, The Chernivtsi Museum of the History and Culture of Bukovinian Jews, Igor Stravinsky House-Museum in Ustyluh, Kyryl Rozumovskyi Palace in Baturyn, Historical and Archaeological Museum «Ancient Aratta - Ukraine» in Trypillia, Lonsky Prison National Memorial Museum in Lviv, Baturyn Museum of Archeology, The Ivan Kotliarevskyi Estate Museum in Poltava, Hryhorii Skovoroda Literary Memorial Museum, Mukhailo Hrushevskyi Historical and Memorial Museum, etc.

In the process of studying the museums of Ukraine we involve students in viewing the virtual tour «Museums of Ukraine in the open air» (<https://museums.authenticukraine.com.ua/ua/>), which was created within the campaign «Authentic Ukraine» Google Ukraine together with the Ministry of Culture of Ukraine. Thanks to the project, seven museums were digitized. Students go on virtual tours to the National Museum of Folk Architecture and Life of Ukraine (Pyrohiv), Museum of Folk Architecture and Life in Lviv «Shevchenkovskyi Grove», Museum of Folk Architecture and Life of the Middle Dnieper (Pereiaslav-Khmelnytskyi), Transcarpathian

Museum of Folk Architecture and Life, Center for Ethnology «Mamaieva Sloboda» (Kyiv), Zaporizhzhia Sich - Khortytsia National Reserve (Zaporizhzhia), Residence of Bohdan Khmelnytskyi (Chyhyryn). Thanks to modern technologies, you can «walk» through museums, see the surroundings, the houses and the museum exhibits from the inside. It is advisable to analyze additional materials on the site (a map with digital museums, for each of which a separate virtual tour was created, textual information about folk architecture and household culture), to pay attention to the unique collections of ethnographic and architectural objects dating from the XV-XX centuries. We also analyze the level of ease of navigation on the web portal (OPEN-AIR).

Experience shows that virtual tours are successfully used in classes to attract students to the cultural heritage of our country and the world. Possible options for studying the topic of museum classification may be as follows: the student chooses the profile of the museum and prepares a tour, using a virtual tour of the museum according to the plan, which justifies the choice of the tour, selection of objects, compiles their description; creates a route and a tour plan; prepares and processes the text of the tour.

With the help of virtual museum technology, higher education students have the opportunity to learn the methods of organizing and conducting tours of various directions, because it is a necessary part of successful study of the discipline «Theory and methods of teaching tourism». This function is realized in the study of historical, natural, art and other museums by students, in the development of material, methods and technologies that can serve as a basis for creating and conducting future tours, including virtual ones.

The experience of students creating their own virtual museums and excursions is valuable, first of all, during the advanced training: this can be one of the individual tasks of the advanced trainer. To create a virtual museum, students are invited to use various applications, including: izi.TRAVEL or Google Arts & Culture, ArcGIS and others. According to the survey results, respondents most often use izi.TRAVEL (60%), because this application is easier to use.

Technologies for the development of virtual museums are focused on the development of creative abilities of students, individualization of the educational process, the formation of skills of self-mastery and application of knowledge. Elements of distance learning are used for this purpose, the advantages of which are visiting the museum. This encourages students to develop independence and responsibility, which increases their motivation to learn, as well as develops students' analytical skills, creativity and enriches the experience of working with modern technologies. And that, in its turn, increases their skills and competitiveness in future professional activities.

To develop a virtual museum, students need photos of the selected museum and its exhibitions, an excursion text about the selected object, access to Google navigation, the selected application and a smartphone.

Students are invited to create (individually or collectively) a virtual museum according to a certain pattern, choosing the object of their own house, apartment, room, etc. According to all pedagogical rules of entertainment, the game has a significant educational effect, because usually a seemingly easy task requires considerable effort and allows you to develop professional skills at the level of those which are being taught during the training.

Creating a student's own virtual museum and tour can be a task for current and final control (diagnostic tool), for which, however, it is necessary to develop appropriate evaluation criteria: for example, planning quality, route quality, text quality, creativity, etc.

Thus, virtual museums are not only an effective educational resource, but also an effective center of interpersonal communication, an interactive learning environment that provides students with knowledge through the development of figurative, associative, abstract and critical thinking, motivates and expands worldview.

In order to identify the effectiveness of the introduction of virtual museums and excursions in the studying process, we conducted students' observations and testing. Two groups of students were formed for experimental work: a control group (n = 22 people), within which students studied according to the traditional scheme of educational process, and an experimental one (n = 20 people), the process of learning of tourism disciplines included the

introduction of virtual museums and excursions (Table 1). The testing included 30 test tasks and 30 visual recognition test questions. Students had to answer the test tasks, determining the correct answer (A, B or C), for which they received 1 point. The total number of points determined the level of higher education mastering by professionally-oriented knowledge: low level was determined by the presence of 1-10 points, medium level - 11-20 points, high level - 21-30 points. The study revealed that at the beginning of the pedagogical experiment there were no significant differences between the rate of mastering professionally-oriented knowledge by students of the control and experimental groups, which indicates their homogeneity.

We should note that at the end of the pedagogical experiment there were the following changes in the results of test questions: the number of students with a low level of professionally-oriented knowledge mastering in the control group decreased by 13.59%, in the experimental - by 25%; the number of students with an average level increased in the control group by 9.08%, in the experimental group - by 15%; the number of students with a high level increased in the control group by 4.51%, in the experimental group - by 10%. At the end of the pedagogical experiment on visual recognition tests, the following dynamics of levels of professionally-oriented knowledge mastering was observed: the low level decreased in the control group by 9.09%, in the experimental group - by 45%; the number of students with an average level increased in the control group by 9.09%, in the experimental group - by 30%; the number of students with a high level did not change in the control group and in the experimental group increased by 15%. Thus, the experimental data confirm the effectiveness of the use of virtual museums and tours in the training process of a tourism specialist.

**Table 1.** Levels Dynamics of Professionally-oriented Knowledge Mastering by Tourism Specialists

Group		Control group (n=22)		Experimental group (n=20)		
Stage		beginning	end	beginning	end	
Test Tasks						
Levels	low	Absolute value	13	10	12	7
		%	59,09	45,5	60	35
		Difference in %	-13,59		-25	
	medium	Absolute value	7	9	6	9
		%	31,82	40,9	30	45
		Difference in %	+9,08		+15	
	high	Absolute value	2	3	2	4
		%	9,09	13,6	10	20
		Difference in %	+4,51		+10	
Visual Recognition Test Questions						
Levels	low	Absolute value	15	13	13	4
		%	68,18	59,09	65	20
		Difference in %	-9,09		-45	
	medium	Absolute value	6	8	6	12
		%	27,27	36,36	30	60
		Difference in %	+9,09		+30	
	high	Absolute value	1	1	1	4
		%	4,55	4,55	5	20
		Difference in %	0		+15	

Source: Search data.

Thus, the relevance of virtual museums and excursions using in the educational process of higher education is due to its relevance (due to the pandemic) and the novelty of this technology, the motivation of student interests, the need to develop creative abilities and professional competencies. The experience of implementing these technologies in the process of tourism disciplines studying persuasively proves that they increase the information capacity of classes, make them more presentable and interesting for students. A virtual museum and a virtual tour can be considered as an effective organizational form of tourism disciplines studying.

We emphasize that the use of virtual tours at museums has its advantages and disadvantages in the educational process. The advantages of this technology include many factors:

- accessibility (an opportunity for students including ones with disabilities or from low-income families to see the best museums and their collections, world art masterpieces, to hear the best guides and the best excursion texts);
- interactivity (students are in conditions close to real, having the opportunity to influence on the course of the tour);
- informativeness (obtaining the information about the museum and any of its objects, and a significant portion of visual information contributes to memorization);
- time limitless (possibility to view the exposition at any convenient time);
- safety («traveling» on a computer monitor or smartphone a student avoids physical difficulties and dangers, and the risk of an accident is minimal);
- reliability (obtaining «first hand» information);
- modernity (use of innovative methods, techniques and Internet technologies relevant to young people to solve creative problems).

The disadvantages of using virtual tours, in our opinion, are their dependence on technical factors, limited capabilities of the format for perception (maximum format - 3D), low level of memorization of text (logical) information, lack of feedback (communication with the guide, because the majority of tours are not online), labor-intensive (significant time spent on viewing and creating), low profitability (in the process of professional tourism).

Thus, a virtual museum and a virtual tour cannot completely replace a real presence in a museum, although they do provide an overview of the object under study. However, a study by researchers found out that students who attended a virtual tour showed better knowledge than those who were present at the museum on the tour (TATLI et al., 2021). In our opinion, the full study of tourism disciplines involves real and virtual tours of real museums for educational purposes, i.e. the optimal combination of reality and virtuality in tours based on the interests of students and the tasks of the teacher.

## CONCLUSIONS

Thus, today virtual museums and excursions are a new relevant phenomenon in the information and communication space in general and the information and educational environment in particular. They are inextricably linked with the development of the information society, the active introduction of information and communication technologies, the processes of globalization of the world, the improvement of the intellectual and cultural level of mankind. The introduction of virtual museums performs a number of important functions: scientific, cultural, educational, educative, etc., which are aimed at preserving the most valuable memory and heritage of mankind, defining and recalling the axiological coordinates of its existence. These and similar achievements also demonstrate the humanistic aspects of modern society, as they make travel possible for people with special needs: people with disabilities, the poor and the forced or forcibly restricted in their movement.

In modern conditions, such technologies have become especially important for the preparation of tourism students, being implemented as a means of teaching, control, and education in various forms of teaching and student activities, as a means of acquiring and developing general and professional competencies needed in future. The use of all kinds of virtual museums and excursions allows to diversify the studying process, revives the work of students in the classroom, promotes better learning, stimulates interest in the subject and in general in the chosen specialty, motivates graduates to develop their creative potential, enriches professional erudition, etc. The study of virtual museums, excursions, tours, their creation and implementation is actually an important topic of tourism disciplines. Having its advantages and disadvantages, the technology of virtual museums and excursions, rationally combined with the study of traditional museum institutions, is logically implemented in the process of training future professionals in tourism.

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### Virtual museums using in the process of tourism disciplines studying

Museus virtuais usando no processo de estudo de disciplinas de turismo

Museos virtuales utilizando en el proceso de estudio de disciplinas turísticas

#### Resumo

O artigo comprova a viabilidade da introdução de museus virtuais no processo de estudo das disciplinas do turismo. Foram identificadas as principais vantagens da implantação de museus virtuais como acessibilidade (em particular para pessoas com deficiência, baixa renda e isolamento imposto), interatividade, informatividade, tempo ilimitado, segurança, confiabilidade e modernidade. Descreve-se a utilização de museus virtuais em diferentes formas de atividade pedagógica: trabalhos dentro e fora da aula, formação avançada e ferramentas de diagnóstico. Os resultados de uma pesquisa com alunos, que confirmou a conveniência do uso de excursões virtuais no processo educacional (é interessante para os alunos, aumenta o nível de domínio de conhecimentos e habilidades profissionalmente orientados, contribui para o desenvolvimento de um interesse profundo sustentável em comunicação com objetos de museu, o desenvolvimento de habilidades criativas, a formação de competência midiática) são apresentados. Mostra-se que os museus virtuais oferecem a oportunidade de preencher o processo de aprendizagem com novos conteúdos interessantes por meio do uso de modernas tecnologias da Internet.

**Palavras-chave:** Tecnologia da informação e comunicação. Realidade virtual. Museu virtual. Excursão virtual.

#### Abstract

The article substantiates the feasibility of virtual museums introducing into the process of studying tourism disciplines. The main advantages of implementing virtual museums such as accessibility (in particular for people with disabilities, low-income and imposed isolation), interactivity, informativeness, time limitless, safety, reliability and modernity have been identified. The use of virtual museums in different forms of pedagogical activity is described: work in and out of the class, advanced training and diagnostic tools. The results of a student survey, which confirmed the expediency of virtual excursions using in the educational process (it is interesting for students, increases the level of mastering professionally oriented knowledge and skills, contributes to the development of a sustainable in-depth interest in communicating with museum objects, the development of creative abilities, the formation of media competence) are presented. It is shown that virtual museums provide an opportunity to fill the learning process with new interesting content through the use of modern Internet technologies.

**Keywords:** Information and communications technology. Virtual reality. Virtual museum. Virtual tour.

#### Resumen

El artículo prueba la viabilidad de introducir los museos virtuales en el proceso de estudio de las disciplinas turísticas. Se identificaron las principales ventajas de implementar museos virtuales, tales como accesibilidad (en particular para personas con discapacidad, bajos ingresos y aislamiento impuesto), interactividad, informatividad, tiempo ilimitado, seguridad, confiabilidad y modernidad. Se describe el uso de los museos virtuales en diferentes formas de actividad pedagógica: trabajo dentro y fuera del aula, formación avanzada y herramientas de diagnóstico. Los resultados de una encuesta a estudiantes, que confirmó la conveniencia de utilizar excursiones virtuales en el proceso educativo (es interesante para los estudiantes, aumenta el nivel de dominio de conocimientos y habilidades orientados profesionalmente, contribuye al desarrollo de un profundo interés sostenible en la comunicación con objetos de museo, el desarrollo de habilidades creativas, la formación de competencias mediáticas). Se demuestra que los museos virtuales ofrecen la oportunidad de llenar el proceso de aprendizaje con nuevos contenidos interesantes mediante el uso de tecnologías modernas de Internet.

**Palabras-clave:** Tecnología de la información y las comunicaciones. Realidad virtual. Museo virtual. Tour virtual.