



**Eszterházy Károly Catholic University, Doctoral School of Pedagogy**

**Digital Pedagogy Module**

**Head of the Doctoral School of Pedagogy:**

Dr. Béla Pukánszky, dr. habil, DSc, MTA Doctor

**Csaba Ringert**

# **SYNTHESIS OF DIGITAL MUSEUM PEDAGOGY MODEL**

**Theses of PhD dissertation**

**Supervisors:**

Dr. Zoltán Szűts, dr. habil, Associate Professor

Dr. Attila Verók, dr. habil, Professor

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## The purpose, theme and novelty of the dissertation

**The aim of my doctoral dissertation is to define digital museum pedagogy and to create a related model.**

Nowadays, the development of digital tools provides countless new, effective solutions and opportunities for museums as well. The pandemic that broke out at the beginning of 2020 also forced the closure of cultural institutions which were compelled to enter the virtual space with a more intensive presence. Previous developments have emerged, digital contents have been renewed, and more importantly, content development supporting the education has begun in the museum sector on such a scale that has never been seen before. As a result of this compulsion, institutions have sought to play a greater role in supporting digital education at home. The museum profession quickly realized that although there are nationally recognized digital museum development workshops, smaller institutions are lagging behind in their knowledge of the development environment. In consideration of the epidemiological situation, several open and internal trainings were organised by educational workshops operating in the public collection profession. E.g.: the MuseumDigitár team, with the Infotér Association and with the professional support of the Museum Department of the State Secretariat of Culture by EMMI (Ministry of Human Capacities), has started a free online digital museology training for professionals working in public and private collections, as well as for graduate students interested in museum work.<sup>1</sup>

The Digital Wellbeing Programme (DWP) and the Public Collection Digitisation Strategy (PCDS) also call for the fundamental need for digital development.

As part of the DWP the Digital Comenius Annual Report 2021 is published, the general summary of which includes the need to pay particular attention to supporting students' extracurricular learning during the ongoing digital transition (Racskó, 2017). The report emphasises the partner role of parents and families and the involvement of learners in learning and learning support processes, as opposed to static learning organisation and work forms. Group learning, lively, experiential work forms based on student activity should play a role in everyday life.<sup>2</sup>

The strategy of DWP is PCDS, which aims to make our cultural heritage in Hungarian public collections more widely available to people interested in culture. By ensuring access to digitised cultural goods, PCDS contributes to the development of content that enables the public collection system to effectively create new digital educational content.<sup>3</sup>

The digital competence of teachers and students has clearly improved in recent years. Adults are becoming more and more adaptable in the world of digital devices. Thanks to this, among other things, the majority of museum visitors have one or more tools that make museum

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<sup>1</sup> <https://pulszky.hu/news/ingyenes-online-digitalis-muzeologiai-tovabbkepzes/> (Downloaded: 12.10.2021)

<sup>2</sup> <https://7be50765.flowpaper.com/djpcomeniusjelentes202201112/#page=52> (Downloaded: 15.01.2022)

<sup>3</sup> <https://digitalisjoletprogram.hu/hu/tartalom/kds-kozgyujtemenyi-digitalizalasi-strategia> (Downloaded: 18.12.2021)

services available for them digitally and interactively as well. Modern technology is indisputably suitable for the presentation of the built, intellectual and material heritage and various exhibitions. It provides a surface that is easy to maintain, edit flexibly, expand and form freely. A great solution for this is a number of modern technological methods which can be used as information channels in the museum.<sup>4</sup>

With the help of digital technology, it is possible not only to present the environment and objects, but also to expand the knowledge of students and adults through digital competence development. By using their mobile or desktop tools visitors can access the museum collection and the built knowledge related to intellectual heritage, either interactively or playfully.

With the use of digital tools, not only will knowledge be expanded, but cooperative learning will also be possible. Traditional classroom group work can be complemented by the implementation of a joint project based on museum research and digital collaborative work.

If we look at the availability of ICT tools, it can be said that there are significant differences between social groups, but also between the countries of the European Union. For this reason, it is important to state that if we are developing digital content for educational purposes, we must either make sure that the appropriate platform is available to the user or ensure that it is used. This can be especially important if the acquisition of knowledge in public collections is carried out within the framework of digital museum pedagogy. At this time, the student must have access to the appropriate communication channel.

Digital museum pedagogy provides the opportunity of individual or group adaptive learning in a non-formal learning environment, processing static material heritage, while contributing to the development of the ICT literacy of the person performing the activity.

However, due to the pandemic situation mentioned earlier, museums will not only have to think about narrowly interpreted museum spaces, but will also have to adapt to the user's or visitor's home-acquired or simply experiential activities in the future. When we talk about digital museum pedagogy, we also think about this task.

In terms of age groups, it may seem that we are mostly addressing the young school and higher education students. At the same time, the digital museum pedagogical developments, whether in the virtual space or in the real space, aim to reach out to adult and elderly visitor groups. In this case, the literature talks about museum andragogy and museum gerontology (Andrásné, 2016).

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<sup>4</sup> <https://digitalisjoletprogram.hu/hu/tartalom/dos-magyarorszag-digitalis-oktatasi-strategiaja> (Downloaded: 02.11.2021)

**In conclusion, in the thesis we are looking for answers to the following questions:**

- Does the museum profession have a unified approach or methodology that can be taken into account when planning digital museum pedagogical activities?
- Do museum professionals have the knowledge to integrate digital tools into museum pedagogical practice?
- Can digital museum pedagogy be interpreted exclusively online or possibly in real space?
- Do museums think about aspects other than the use of digital devices?

For our questions, in the thesis we try to establish hypotheses, examine them, and then prove them. However, it is significant to note that digital museum pedagogy does not have a uniform definition, so above all it is necessary to create the concept. For this, it is essential to present and understand the currently well-known definition environment. Digital museum pedagogy does not simply mean complementing museum pedagogy with digital tools, but defining a methodology in a novel, non-formal educational environment that is suitable for the concurrent development of students' material knowledge and ICT literacy, the mediation of museum knowledge, and the support of the digital conversion of museums (Racskó, 2017).

In my opinion, it is in the well-understood interest of all museum institutions to take advantage of the opportunities of the digital world to make our cultural heritage, public collections, built and intellectual heritage available through new developments and innovations (Veres & Verók, 2017).

## **Structure of the thesis**

In the first chapter, I present the validity and timeliness of my choice of topic. I will also briefly discuss the personal aspects.

In the second chapter, I present the conceptual framework of museum pedagogy, ICT literacy and digital pedagogy. In all three cases, I try to look for links, thus preparing the model in which digital museum pedagogy can be integrated.

The definition of museum pedagogy has changed a lot in the last decade. With pedagogical methodological developments, new methodological procedures were introduced in the school. At the same time, the museum industry has tried to keep up with the innovations taking place in the school system.

The broad conceptual framework for ICT literacy focuses not only on the use of ICT tools. It also deals with social, ethical, legal and cognitive aspects, which are organically linked to museums and museum pedagogical activities.

The introduction of the concept of digital pedagogy is important to us because through it we can get to all the activities carried out by ICT tools, which can be done by the application of traditional and constructive pedagogical processes and methods.

In the chapter, I will also examine the documents relevant to the processing of the topic, which govern the current public education and museum system, the national core curriculum and the framework curricula.

In the third chapter of my thesis I present the model of digital museum pedagogy that I have created. In this, the concepts previously discussed are integrated.

In the fourth chapter, I present my hypotheses formulated while modeling and to justify them I will carry out my subsequent examinations.

In the fifth chapter, in the framework of a qualitative examination, museum pedagogical and museum developments are analyzed, which help to interpret the model of digital museum pedagogy. This will make it clear to us what we mean by this, and we will be given a set of criteria on the basis of which we can evaluate our own developments. I included the web museum content available online in October 2021.

In chapter six, I examine a specific digital museum pedagogical camp session in the framework of a quantitative questionnaire study, which shows what aspects need to be taken into account to be able to analyse a specific developed program. In connection with the virtual exhibition developed in the Dobó István Castle Museum, a digital museum pedagogical content development took place, in which the Egri Vocational Training Centre also participated as a partner. The aim of this is to provide the participants with historical and gastronomic knowledge related to the grape and wine culture of Eger, which they can link to their daily study activities.

In chapter seven, I summarize my experience gained while modeling and make suggestions regarding the further use of the model.

## **Museums of the 21st century: traditional or digital?**

In parallel with the emergence of digital technologies in museums and museum environments, a debate has started on digital display versus traditional technologies. This debate still exists among professionals to this day. However, thanks to the intensive, forced digitalization of recent years, the opinions of patrons and skeptics have changed a lot. The large-scale digitalization and digital content development carried out during the pandemic gave a new impetus to the museum profession. (Kassai, 2021).

At the beginning of the development, the question always arises in the exhibition curators and museum educators whether, with an excessive digitalization, visitors move away from real, tangible museum spaces and preserved artefacts or not. Previous international experiences and researches have shown that opening a museum in the digital space tends to raise the attention of potential visitors and increase the need to acquire an offline museum experience.

Museum professionals are often criticized for intending to convey an unreasonable number of information to visitors. This is often associated with the redundancy of exhibition texts in

the case of traditional "offline" exhibitions. In a tableau or description, the curator strives to convey so much information and knowledge which is almost impossible to receive and process in the case of a large number of objects. In the latest developments, such digital solutions have emerged, with the help of which the visitor has direct access to the aforementioned contents, but he can take them away from the museum and later, under calm circumstances, he can browse them through and interpret them. During the digital transformation of museums, this approach reflects a visitor-friendly approach and helps us to expand our knowledge and carry out further researches and investigations. In such cases, the visitor will not have any shortages, and it is easier for him to recall what he has seen and heard. It is also very important that we can select in the information set. We are able to pay more attention to the content units we prefer. This option of selection contributes even more to the processing of the subject and, most importantly, to the experiential expansion of knowledge. In this case, the visitor is happy to look back on what he saw, the viewing of the museum exhibitions and his attitude towards visiting the museum is expected to change positively.

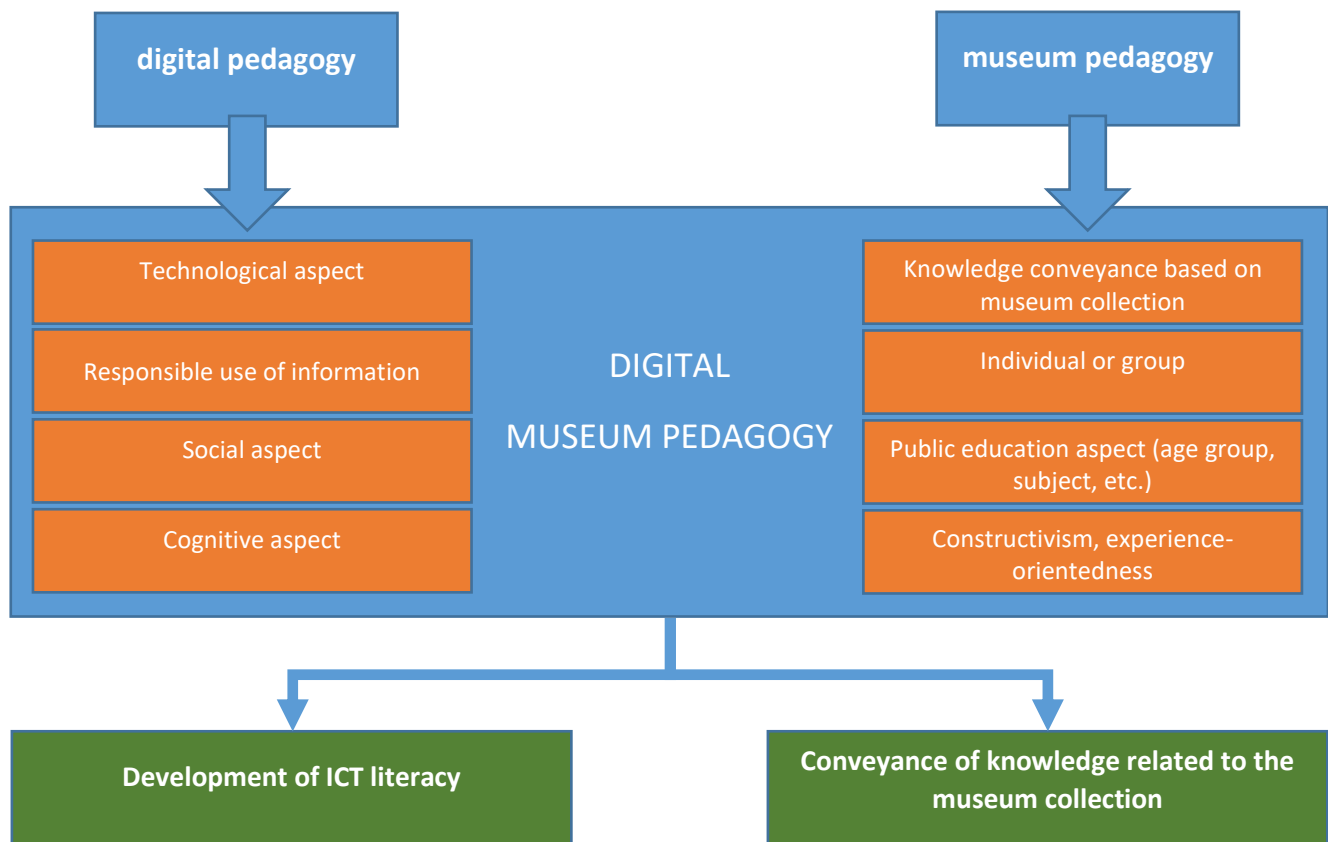
In the course of contemporary museum developments, the expression of the experiential exhibition and the concept of experience pedagogy are being used more and more. Museum professionals should provide visitors with an experiential experience in the course of modern 21st century museum developments. It's an expectation of one sort these days. If a new museum exhibition tries to present its artworks using traditional methods, it can be immediately considered boring or even underdeveloped. The use of digital tools and technology is not omniscient, but it can add a lot to achieve visitor satisfaction in this area. Naturally, experience can be ensured by other methods as well, just think of the museum programs like live historical interpretations, interactive presentations, playful discoveries. They can work without digital technology.

## **Model of digital museum pedagogy**

Integrating the concepts described, digital museum pedagogy is defined as follows:

Digital museum pedagogy is an experience-oriented museum activity that takes place in a specially real or virtual museum environment using ICT tools, and it has a direct impact on the development of the ICT literacy of the participants and on the transfer of knowledge about the cultural areas related to the museum collection.

Based on the definition, the model of digital museum pedagogy (DIMUP model) can be represented as follows:



## Hypotheses of research related to the synthesis of the model of digital museum pedagogy

The implementation of the digital museum pedagogical model in practice was analyzed by a qualitative and a quantitative study. During the studies, our aim is primarily to show how we can analyze the digital museum pedagogical activities available in museum practice, based on the model we have prepared. The analysis will help us to provide guidance on what improvements can be made if we want to provide a solution for all the content elements of the model in the future.

For modeling, we used the conceptual system presented in the second chapter. In the course of our work, we have formulated several problems that can be examined by formulating hypotheses.

**We formulated a hypothesis for each of the problems raised, to which we tried to find answers during our research:**

**H1. Museums have a vision of digital museum pedagogy, but there is no unified approach to implementation.**

During the development of museum pedagogy, the use of digital tools has already appeared, even within the framework of the digital museum, but a unified methodology and approach has not yet emerged in the profession. In the course of digital museum pedagogical developments, the use of digital pedagogy is not consciously carried out, and museum professionals do not deal with certain aspects of ICT literacy. The planning of the sessions is more desultory, often the available digital content and human development capacity determines what, with what and how we create digitally.

**H2. Museum experts are currently not ready to digitally stream museum content.**

According to our hypothesis, during the training of museum professionals, the methods and digital professional competence development that can be used in digital museum pedagogy have not been focused on at the training institutions so far. The concept of digital museum has been present within the profession for a long time, but the possibility and method of applying digital pedagogy and museum pedagogy together has not been introduced by higher education in the course of training planning. For this very reason, the digital museum pedagogical contents that can be examined are likely to present a very colorful picture, and the integration of digital pedagogy and ICT literacy in activity planning is interpreted in very different ways.

**H3. Digital museum pedagogy can be interpreted online.**

In the first period of the viral situation, we were able to limit the management of the sessions almost exclusively to the online space. However, the question arises as to whether this is the only solution, or whether it is possible, like the public education system, to implement a kind of hybrid one. According to the definition of digital museum pedagogy, the activity takes place in a real or virtual museum space. Accordingly, with our hypothesis, we want to examine whether digital museum pedagogy in real space can be interpreted in museum practice.

**H3.1 Digital museum pedagogy also ensures the experience of detecting artefacts in real space also online.**

The basic goal of museum pedagogy is to convey knowledge through artefacts. In the implementation of digital museum pedagogy in the online space, the participants do not encounter objects in real space, however, it can be assumed that the experience is not impaired by this, moreover, it can be enhanced with the help of digital technologies.

#### **H4. Elements of the concept of ICT literacy appear only at the level of device use in digital museum pedagogical content development.**

According to our proposal, the museum profession integrates digital technology into museum pedagogical practice only at the level of device use. ICT literacy, on the other hand, also articulates other aspects, which, in addition to the use of traditional ICT tools (technological aspect), also focus on the development of the other three areas (social, cognitive, responsible use of information).

##### **H4.1 The development of social competences is experiential when applying digital museum pedagogy in real space**

During the use of devices in digital museum pedagogical activities, cooperative, collaborative work can be easily applied. This is experiential for the participants.

#### **Examining good practices in the museum to interpret the model of digital museum pedagogy**

The aim of our analysis is to examine the digital museum pedagogical practices of the Hungarian museum sector and the appearance of elements of our presented digital museum pedagogical model in the individual services and occupations.

In our view, today's museum profession uses the conceptual system presented in the digital museum pedagogy model in a very different way. Diversity is mainly due to the different application of digital pedagogy and related ICT literacy development. This is less strange, because while one of the determinant areas of public education developments in recent years has been digital pedagogical, digital competence development and related professional and methodological renewal, the museum sector has also dealt with the concept of digital transformation, but the main direction of this was the digitization of public collection content, the provision of online accessibility and virtualization. Digital pedagogy appeared in the professional developments of some institutions even before 2020, but planned, conscious professional developments started significantly only with the appearance of the pandemic.

All national museums, national thematic museums and city museums with county scope were included in the study, but only those where digital educational content can be found in any form are analysed in detail. For analysis, we use the public website of the institutions as the most important communication platform.

Compliance with the elements of the digital museum pedagogical model is determined on the basis of a set of criteria created for this purpose. The purpose of our findings is not to prove whether a particular program or activity can be considered a digital museum pedagogical service, so we do not want to make a judgment! The aim of our analysis is to show through each example how we think about digital museum pedagogy in practice, what good practices there are for the real illustration of each element.

## Presentation of our analytical aspects

For easier clarity, the analysis criteria are presented in tabular form. The concepts presented earlier provide a basis for defining the criteria. In the course of the analysis, therefore, we clearly rely on the definition elements used in the concepts.

| Analytical considerations                                                          | Instructions for performing the analysis                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The emergence of digital pedagogy                                                  |                                                                                                                                                                                                                                            |
| SAMR model compliance (Puentedura, 2013; Prievara, 2020)                           | We examine the appearance of the 4 levels presented in the model, based on the information available on the institution's website. To what extent do the programmes offered by the institution incorporate digital pedagogy into practice? |
| ICT literacy criteria                                                              |                                                                                                                                                                                                                                            |
| Development of technological literacy (online platforms, digital devices)          | Are ICT tools and online technology integrated into the activity?                                                                                                                                                                          |
| Development of cognitive abilities                                                 | Does any form of activity aimed at developing cognitive abilities appear during the session?                                                                                                                                               |
| Development of social competences (cooperative work, online collaboration)         | First of all, we examine the development of social relationships. During the session, we take into account the joint work of the participants in an online form. Is it possible to work collaboratively?                                   |
| Responsible use of information (legal, ethical, personal safety and health issues) | During the sessions, do teachers think about areas related to the responsible use of information?                                                                                                                                          |
| Museum pedagogical aspects                                                         |                                                                                                                                                                                                                                            |
| Information based on museum collection                                             | Are the activities in line with the museum collection?                                                                                                                                                                                     |
| Without age limit/age-related/both                                                 | Which age group are the sessions for? Can it be clearly defined? Is there any information to this?                                                                                                                                         |
| Group/individual/Both                                                              | Do museums offer group or individual activities?                                                                                                                                                                                           |

|                                                                                         |                                                                                                                                              |
|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| The connection with public education has been marked (grade, field of culture, subject) | Is the connection between public education and subjects clearly marked?                                                                      |
| Adaptability appears                                                                    | Do program developers think about the different skill levels of participants? Is it possible to choose from tasks of various difficulty?     |
| Strives for experientiality, playfulness appears                                        | Do the sessions specifically contain elements that provide an experiential way of acquiring knowledge? Are there any games available online? |

## Hypotheses in the light of the results

### **H1. Museums have a vision of digital museum pedagogy, but there is no unified approach to implementation.**

In the case of national and county museums included in the analysis, it can be concluded that in 14 (48%) of the 29 national museums and in 11 (58%) of the 19 county museums we have found digital museum pedagogical content for analysis.

At the same time, the use of the concept of museums is very diverse: online museum pedagogy, digital museum pedagogy (6 museums), educational resources, educational aids, online museum, digital museum, e-museum, digital learning materials, museum pedagogy online, online educational aid, etc.

Published activities also use digital technology in very different ways.

Based on this, it can be said that there is indeed a preview of digital museum pedagogy in the museum profession. However, its implementation takes place in a very different way, the use of the concept itself is already varied, so it is clear that a unified methodological approach has not yet developed in this area.

### **H2. Museum experts are currently not ready to digitally stream museum content.**

In assessing the digital pedagogical preparedness of museum professionals, we use the analysis according to the SAMR model. Based on the model, published content has been classified, so it can be seen clearly to what extent museum professionals were able to move on from the substitution level of the SAMR model when integrating digital pedagogy into the educational process.

Based on the analysis (see graphic 26), it can be seen that only 16% of museums remain at the level of the simplest substitution, 56% have already moved on to the level of extension, during which the conscious, planned and functional use of digital technologies is already achieved. In

addition, it is surprising that at 7 institutions (28%) the reinterpretation appears as well, which according to the SAMR model, is the highest level of integration of digital pedagogy into the educational process.

Based on these, we can state that, contrary to the initial assumptions, some museum professionals are able to consciously, systematically and functionally correctly apply the possibilities provided by digital devices. Naturally, the majority of museums have implemented the development at the level of expansion according to the SAMR model, which, given the time it took to implement the controversial digital transformation in the public education system, can still be considered an outstanding innovative intention and development.

### **H3. Digital museum pedagogy can be interpreted online.**

We examined the analysed museum contents not only on the basis of model compliance, but also on how, in contrast to forced confinement, institutions imagine holding the workshops. Limited to online space, or possibly in a blended way, with a combination of real and virtual space.

During the analysis, we had a completely mixed picture. The museums have been presented with activities that take place entirely through an online channel, but there are also blended museum lessons, which are often combined with experimentation and objectification, to which the help is provided digitally by museum educators.

With the partial lifting of the restrictions, it was also possible to hold museum activities in real space, in the course of which the institutions also use digital devices and incorporate the online content they develop into their daily practice.

Based on the above, we can therefore state that, contrary to our initial suggestion that digital museum pedagogy can only be imagined in the online space, we must see that institutional practice, although at the beginning of the pandemic it was limited to the online space, shows that digital museum pedagogy as outlined by us has a place in real space as well. And here we consider it important to emphasize that not only at the level of device use, but also beyond, paying attention to the digital pedagogical implementation levels discussed in detail and the aspects related to ICT literacy.

### **H4. Elements of the concept of ICT literacy appear only at the level of device use in digital museum pedagogical content development.**

The elements of the concept of ICT literacy were analysed separately during the examination of each museum development. Out of the 25 institutions included in the sample, in addition to the development of technological literacy, the development of cognitive abilities is also reflected in the digital museum pedagogical practice in the case of 20 museums. This in itself shows that, contrary to our hypothesis, museum educators focused not only on the use of devices when planning the workshops, but also on the development of cognitive abilities. Judging how conscious this was is not part of this study.

In addition, the development of social competences in 8 institutions and the responsible use of information in 4 museums were also incorporated into the programmes.

### **Examining the implementation of digital museum pedagogy during a specific museum project week**

To examine the model of digital museum pedagogy, in addition to analyzing the previously presented websites, I was looking for such a specific workshop implemented in a museum environment, in which the elements of digital pedagogy, digital competence development and museum pedagogy can be found in whole or in part.

During the forced closure caused by the pandemic, it was very difficult to establish any personal contact with teachers and students. In June 2021, the Dobó István Castle Museum incorporated its completed virtual exhibition entitled "EGRI BORKostoló – The Heritage of Viticulture" into the holding of camp workshops in its camp entitled Mastery. The theme of the camp was related to the cultivation of grapes and wine in Eger. During the five days, the leading museum educators and ethnographic museologists occasionally processed the virtual exhibition in line with the theme.<sup>5</sup>

#### **Presentation of the test**

In June 2021, at the Dobó István Castle Museum, we conducted a questionnaire survey entitled "Attitude survey related to digital museum pedagogical developments". The subject of the study is the virtual exhibition called EGRI BORKostoló – The heritage of viticulture, developed by the museum, published in 2021. The exhibition contains a number of elements in its content that make it suitable for presenting the digital museum pedagogical model outlined by us. During the development, the creators paid special attention to the possibilities of museum pedagogy utilization and to making independent knowledge acquisition experiential.

The questionnaire query was carried out twice, before and after the camp. The students taking part in the camp participated in the query voluntarily. 11 of the 15 students completed both questionnaires. The first questionnaire was completed by 14 students, while the second questionnaire was completed by 11 students. Since filling out the questionnaire was possible only in the camp, among the participating students, the sample is not representative. However, it is important for our modeling, as several elements of digital museum pedagogy are emerging that we can examine in practical activities and this can give us the opportunity to draw possible conclusions and refinements.

In the first questionnaire, we focused on two important areas. We were interested in how students relate to the use of ICT tools in education, how they use them in learning and everyday life. In the second half of the questionnaire, we asked questions about their relationship to the museum and the use of museum devices.

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<sup>5</sup> <https://egribor.egrivar.hu/>

The second questionnaire contains 13 questions. In this we asked specifically about the virtual exhibition used in camp workshops, about the use of ICT tools, and the attitude towards museum learning supported by ICT. The questions of this questionnaire focused more on the student's attitude and its change.

### **Summary of the results of the study**

We examined the inclusion of the Egri BORKóstoló – the heritage of viticulture in a virtual exhibition, into museum pedagogical practice, in the camp called Mesterkedő organised in the Dobó István Castle Museum. We originally wanted to evaluate the utilization of the virtual exhibition for museum pedagogical purposes in several activities announced by the museum, but the epidemiological situation did not allow this. Regardless of its number, the size of the sample, we consider the presentation of the results obtained to be important. The questionnaires can be used in further research. Based on the responses received, we can get an idea of students' attitudes towards digital museum pedagogy.

In the creation of the model of digital museum pedagogy, it was important to examine the practical application of a workshop that, in accordance with our initial assumptions, contains several essential elements of the outlined model. When formulating the questions, we also wanted to know how students relate to ICT tools at all, and to what extent they see their integration into school and extracurricular education as effective. In addition, it was important for us to get their opinions about the virtual exhibition that we can be suitable for holding digital museum pedagogical workshops. In essence, the implementation of the camp program can be considered as the implementation of a digital museum pedagogical program in real space. This proposal of ours is important because the system formulated in the model does not calculate with completing the task in real space. According to our initial proposal, in order to be able to focus on all the elements of digital museum pedagogy when developing a workshop, it is essential to implement the entire program online.

Based on the answers we receive to our questions, contrary to the statement of our hypothesis "**H3.1** Digital museum pedagogy also ensures the experientiality of the perception of artefacts in real space in an online space" we can state that the participants do need to experience interactions in real space, either in the case of people or objects. To do this, we need to go to the museum and not just live the activity in the virtual or online space.

Another important result of the query was that the participants saw the integration of ICT tools and developed digital content into museum practice very good. We already suspected this from the information we asked about during the first questionnaire, as students have a fundamentally positive attitude towards digital technologies and are happy to use them in school practice. This is especially important, since at the time of the query we had already been over a forced closure, several months of online learning, so we could rightly assume that children's attitudes towards the use of digital tools for educational purposes have changed. However, based on the results, this is not what we are experiencing.

The attitude towards the museum as a non-formal learning environment was also the subject of our investigation. From the answers, it is important for us that students are very happy to take part in such activities, which further strengthens the right to integrate them into the museum pedagogical education system. In addition, they are positive about the use of museum ICT, which is practically a direct path to the development of museum pedagogical activities supported by digital pedagogy.

**According to our H4.1 hypothesis:** "The development of social competences is experiential when applying digital museum pedagogy in real space". Regarding the hypothesis, we received a uniform affirmative answer to our questions in the second questionnaire. The students clearly stated that it was good to work in a group with ICT tools.

During the creation of the model, our opinion about separation into offline and online space clearly changed with the research formulating short but important answers. That is why we tried to create a digital museum pedagogical model that could be applied both online and in real space as a set of criteria for the creation of digital museum pedagogical activities.

## Summary, suggestions

The aim of my doctoral thesis was to create a model of digital museum pedagogy. During my museum work, which started in 2018, I became interested in integrating ICT tools and digital pedagogy into museum practice.

Based on my experience, until the beginning of 2020, we could only talk about the integration of digital technology into museum pedagogical practice in a few traces. However, the pandemic that started in 2020 and online education have made a breakthrough in this area as well. The museum institutions felt compelled to move into the online space due to the general closure, and to start active communication in an area where the sector had very little practice so far. For this very reason, the initial difficulties were, and perhaps still are, inherent to practical implementation. The museums have already had a lively communication about the need for a digital museum and the incorporation of ICT tools into museum practice, but digital museum pedagogy has not received much attention in this area.

Because of these initial difficulties and the less focused development so far, I considered it important to devote my dissertation to this topic. I had to deviate from my original plans to study the implementation of specific activities due to the unpredictability of the ever-present restrictions and the forced closures concerning the students. Therefore, I chose a method that gives a comprehensive picture of the current situation of online or digital museum pedagogy in Hungary, which is the subject of my thesis. Examining the international museum environment, I had to find that in other countries they are not much further ahead in this field than in Hungary. I supplemented my research with the examination of a museum pedagogical topic week carried out in real space but supported with digital technology, which broadened my field of vision while modeling.

For the creation of the model, I tried to present and clarify all the important concepts. Digital pedagogy, ICT literacy as well as museum pedagogy are richly researched, and numerous scientific publications have been published in each topic. By processing these, it was possible to get a comprehensive picture of the conceptual environment necessary for the definition of digital museum pedagogy.

In order to understand the individual elements, I also considered it necessary to carry out a comprehensive examination according to the criteria. Basically, it was necessary to bring two previously relatively remote educational methods closer together and to create a framework in which the role of both areas can be well defined, and neither "prevails" over the other. First of all, I defined it to myself that in order to be able to "do" digital museum pedagogy, one must be an IT teacher and a museum educator at the same time. This was no different when digital developments started in the public education system nearly 20 years ago. These developments have been continuous ever since, and further training related to the development of digital competences of teachers and trainee teachers has been added. Similarly to this practice, I consider it essential for the future to integrate digital competence development for museum professionals as well. At present, this is one of the biggest limiting factors in the supplementation of museum pedagogical activities, if necessary, with digital pedagogical methods that improve ICT literacy. Currently, museum institutions usually use the help of external service providers or at some institutions where they have the opportunity to do so, they call in a museum IT specialist's aid during the developments. When presenting the contents offered by the institutional system, it became apparent that national museums, where both material and personal conditions are significantly more likely to be ensured, are much further ahead in digital content development in the field of museum pedagogy. Until progress has been made in this area, museum professionals will certainly turn back from the forced online space to the traditional, real-world environment.

Knowing this, it is worth considering that museum pedagogy, as an independent museum professional area, should also be included as an independent bachelor's degree in higher education and teacher training. At the same time, it can be a guarantee that the digital competence development, which appears prominently in teacher training, will be integrated into the future museum pedagogical practice.

As a result of the practical examination of the model, additional important basics can be laid. We should not be and do not need to be separated from the museum object environment, the real environment of the museum in order to talk about digital museum pedagogy. Forced confinement in the online space naturally limits the development of social competence and the realization of group activities. We need to move very routinely in the digital world in order to organize collaborative work in which students are not only victims of the activities, but also active participants, sometimes even persons influencing the actions. This is why I have come to the conclusion that the implementation of digital museum pedagogy is not tied to working in the online space, it is not necessary to limit the activities to the digital world alone. Moreover, this was confirmed by the students participating in the camp study, and they

considered it important to highlight the role of the real museum and real art environment in museum activities.

The raison d'être of digital museum pedagogy in the museum environment is unquestionable. Students' susceptibility to ICT tools and experiential applications is high, which is why museums need to develop in this area. However, the dominance of digital devices should not be promoted and marked as the only possible path that leads to the child of our time. In this, too, we are strengthened by children, who show a need for reality, an environment that has a complex effect on the senses.

The model will certainly raise many more questions for readers:

- One can wonder why ICT literacy has been incorporated as a very complex concept.
- The question may also be, should we focus so intensely on museum pedagogy, and why is it not possible to define the activities as something without age limit?
- Is there a need for a public education link?
- and so on...

The important thing for me in the thesis was to create exactly such a model, which would provoke further questions or even controversy. In conclusion, I repeat my own definition of the model created, which was formed from the synthesis of the processed conceptual system:

Digital museum pedagogy is an experience-oriented museum activity that takes place in a specially real or virtual museum environment using ICT tools, has a direct impact on the development of the ICT literacy of the participants and on the transfer of knowledge about the cultural areas related to the museum collection.

## References:

Andrásné, M. Zs. (2016). A múzeum mint az egész életen át tartó tanulás kultúrákövetítő bázisa. *Tudásmenedzsment*, 17(1), 172-177.

Kassai, H. (2021). Digitális kihívások és sikerek a hazai múzeumokban. In G. Kajár & M. Pacsika (Eds.), *Távol is közel... Múzeumi Iránytű 30. (pp. 167-176)*, Szentendre: Szabadtéri Néprajzi Múzeum - Múzeumi Oktatási és Módszertani Központ.

Prievara, T. (2020). Digitális technológia a tanítási órákon. In N. Katona (Ed.), *Digitális pedagógia a közoktatásban (pp. 41-44)*, Eger: Eszterházy Károly Egyetem. Retrieved from <https://www.oktatas2030.hu/wp-content/uploads/2020/10/digitalis-pedagogia-a-kozoktatásban.pdf> (Letöltve: 2021.10.24)

PuenteDura, R. R. (2013). Technology In Education: A Brief Introduction. Retrieved from <http://hippasus.com/blog/archives/80> (Letöltve: 2021.10.12)

Racsó, R. (2017). Digitális átállás az oktatásban. *Iskolakultúra-könyvek*, 52. Budapest: Gondolat Kiadó. doi: [10.17717/IQKONYV.Racsko.2017](https://doi.org/10.17717/IQKONYV.Racsko.2017)

Veres, G., Verók A. (2017). Új taneszközök, újmédia-kompetenciák a kulturális örökség tárgyban. In S. Forgó (Ed.): *Az információközvetítő szakmák újmédia-kompetenciái, az újmédia lehetőségei* (pp. 79-85),. Eger: Líceum Kiadó.

Own publications used in the thesis

Ringert, Cs. (2015). Adaptív pedagógiai módszerek a tanulók aktivizálásában. In: A. Papp-Danka & D. Lévai (Eds.), *Interaktív oktatásinformatika* (pp. 130-137), Budapest: ELTE Eötvös Kiadó.

Ringert, Cs., Tömösközi, P. (2015). A számítógéppel támogatott adaptív oktatási környezet megvalósítása. *Módszertani közlemények* 52(4), 17-24.