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ICT and Cultural Heritage in Greece and Cyprus: A critical overview of current postgraduate *curricula*

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Abstract
One of the most fundamental shifts in the cultural heritage sector, is to be found at the intersection established over the past years, between heritage management and the rapidly growing field of digital technology. In the wake of these developments, the striking majority of professionals in the heritage sector are faced with the challenge of integrating ICT technologies in various workings, functions and purposes of their field (i.e. preservation, restoration, recording, analysis, interpretation, publication, exhibition). At the same time, digital technologies are becoming an integral part of cultural management (project management, event management, collection management etc) but also of cultural communication and public outreach. The analytical significance of this project stems mainly from the fact that it constitutes the first systematized attempt to chart (both quantitatively and qualitatively) all postgraduate programs of study on cultural heritage that are available at present across Departments and Universities in both Greece and Cyprus. The combination of qualitative and quantitative analysis of heritage studies curricula in both countriesalso provides us with an elaborated and refined picture of the professional skills promoted by different academic curricula as regards ICT skills and their implementation in heritage studies. As such, this mapping enterprise can be a useful tool for analytically appreciating the connection between curriculum content andjob requirements and by extension, act as a starting point for creating a sustainable model of synergy between heritage studies and ICT in Greece and Cyprus for the next decades.

Keywords:
Digital Heritage, Higher Education, Cultural Heritage Studies, Cultural Informatics

1.1. Introduction

The integration of ICT in cultural heritage has transformed the structure of heritage institutions and how visitors experience them. Cultural heritage institutions utilize digital media in the management of collections and information, in the practice of curating or in the very experience of visiting, in the support of strategic partnerships and so on (Royston & Parry, 2019). At the same time, a growing body of research shows that digital roles and responsibilities within the museum are currently undergoing a process of professionalization (Barnes*et al* 2018). Royston and Parry (2019) note that as digital engagement becomes standard practice in the professional sector, heritage institutions develop a more nuanced understanding of what kinds of digital expertise they need. An example is that museums are now seriously committed in evidence-based digital practice as data from web analytics and social media accounts are analyzed and used in decision-making processes. Although, the existence of IT departments in heritage institutions of countries like Greece and Cyprus remains scarce, the cultural heritage sector seems largely attuned with the professionalization turn. The norm for the museum professionals is to have specialized degrees closely related to the subject of the collections (i.e. Archaeology, Folklore Studies) (Roscoe, 2016, pp. 10) however in 2018, the Hellenic Ministry of Culture (which owns and manages the majority of

museums in Greece) published in the official Governmental journal (Gazette) its organizational chart, which stated for the first time in its history so far, the need of 7 positions in Cultural Informatics and Technology (Presidential Decree 4, Gazette 22/1/2018).[1]

In the wake of these developments, there is an urgent need to reevaluate professional training offered by higher education in both countries and how it defines the skills and knowledge on digital heritage (Dubuc, 2011; Parry, 2005). In addressing these concerns, the aim of this paper is to examine (a) what kinds of digital expertise are produced by postgraduate programs of study on cultural heritage in Greece and Cyprus and (b) whether they correspond to the transformations taking place in the professional sector. For this examination, we have created a map of all the modules offered by these postgraduate programs. The combination of qualitative and quantitative analysis of heritage studies curricula in both countries provides us with an elaborated and refined picture of the professional skills promoted by different academic curricula as regards ICT skills and their implementation in heritage studies at the onset of the new decade.

1.2 Cultural Heritage and Digital Media: A Brief Literature Review

The subject of 'digital heritage' emerged as a scholarly discipline in the early 2000s with its predecessor being the body of work on museum computing, a project-oriented literature focusing on information and communication (Galani*et al*, 2020; Parry, 2005). The proliferation of publications and conferences on this subject area have created further subcategories such as Digital Art, Digital Marketing, and Digital Heritage (Theodosiou&Papadaki, 2018).[2] The term "New Technologies" has been used since the 1960s to describe the uses of technology as a tool in communication (Theodosiou&Papadaki, 2018), although the term "New" should probably now be replaced by the term "Digital". According to Parry (2005, pp. 339) the major shift in the 21st century that refocused the subject area, was the development of critical approaches towards the value of the digital object, the management of digital information, virtual reality and e-learning. The emphasis laid on impact and the user has produced a cross-disciplinary field, which draws its theoretical tools from diverse areas such as media theory, cultural studies, philosophy of technology, sociology etc (Dubuc 2011; Economou *et al*, 2019; Harrison 2018; Theodosiou&Papadaki, 2018). Under this scheme, digital platforms have been taken to open up opportunities to cultural heritage institutions for developing a dialogue "with existing and new audiences within and beyond their physical boundaries"(Galani*et al,* 2020, pp. 2; *see also* Bounia, 2018).

In the professional sector, digital heritage is now conditioned by: a) rapid technological developments and the growing awareness by professionals for immediate adaptation to new conditions b) a critical wave in scholarship, focusing on the value and effectiveness of digital media, c) a greater degree of "maturity" in the efforts of combining culture and the digital (Parry &Leonard, 2019, pp. 6). New digital roles are cross-disciplinary in nature: they require technical knowledge but also sound theoretical understanding (Bounia, 2018). The integration

[1] Presidential Decree 4, Gazette 22/1/2018, "Ministry of Culture and Sports". Athens, Gazette.

[2] One of the first academic conferences on cultural informatics was the First International Conference of Museology entitled "Museum, Communication and New Technologies", organized in Lesvos, by the Department of Cultural Technology and Communication, University of the Aegean, in 2002.

of digital technologies within the professional sector of cultural heritage has thus raised several concerns as for example: (a) how digital platforms, apps and software expand and limit capabilities and perception (Harrison, 2018), (b) what constitutes an effective digital communication strategy in heritage organizations and how this relates to ethical considerations as well as issues of censorship, transparency and privacy (Wong, 2010), (c) how digital media understand the value of communication and content (Kraemer, 2018) especially in view of the big data debate (Bonacchi&Krzyzanska, 2019). The main concern here is that in order to produce an in-depth critique on the use of digital media in cultural heritage, it is necessary to understand the very definition of digital technology. By extension, what is also brought to the fore are essentially questions relating to digital literacy, education and training: do all professionals require the same digital skills and what kinds of knowledgeare prioritized when time and budget are limited?

A critical movement, towards training museum/heritage professionals in digital heritage took place in April 2014 at the Annual Conference of Museums and the Web, when higher education providers proposed the "Baltimore Principles", a set of working principles, in the Museum Professional Development Forum. The framework provided by the "Baltimore Principles" marks a shift in how digital training is approached (Parry *et al*,2016). Recognizing the standardization of digital practices within the museum profession and the extensive research that has been carried out on digital heritage in the past decade (for example on visualization, participation, mobile media, social media), the "Baltimore Principles" call for a move from training professionals *about technology*to *being with technology* (Jeonghyun, Warga, & Moen, 2013).This is described as the "post-digital" perspective, a conceptual framework that acknowledges the integration of the digital in cultural heritage studies/projects, instead of equating it with technological "innovation" and "adoption" (Barnes *et al*, 2018, pp. 1;*see also*Galani*et al*, 2020). An example here could be how cultural organizations employ web analytics in the design of their communication and marketing strategies.

Two major research projects looked into the digital skills of museum professionals also in the Greek context: eCult Skills and MuSA. eCult Skills was an EU co-funded research project, examining the emerging jobs in digital heritage in six countries of the European Union (including Greece).[3] The main aim was to identify the developing needs of the professional sector in terms of knowledge, skills and competences and to propose alternative. Role Profiles. The ongoing project "Mu.SA: Museum Sector Alliance" (funded by European Framework of Erasmus+ / Sector Skills Alliances and coordinated by the Hellenic Open University in partnership with Mapas des Ideias, Portugal) is the continuation of the eCult project and aims to address the gap between higher education and the professional cultural heritage sector due to the continuous emergence of new ICT jobs.[4]After the initial investigation of the relevance and validity of eCult'sjob profiles in the professional sector, Mu.SA went a step further arguing in favour of the development of *transferable digital competencies*, including strategic and business planning, user needs identification/analysis, technology and trend monitoring, storytelling, innovating (Silvaggi&Pesce 2019).These research projects have shown that (a) much of the heritage sector still lacks the skills essential for a real digital (or post-digital?) turn and (b) professionals are not provided with formal/coherent training on digital skills (see also Royston & Parry 2019).

[3]http://groupspaces.com/eCult/ Last accessed 16 December 2016
[4]http://www.project-musa.eu/ Last accessed 16 December 2016

1.3. Is there a gap between university and profession? A critical mapping enterprise focusing on the current state of affairs in Greece and Cyprus

1.3.1 Methodology

An important stage of our research project was the identification and recording of postgraduate programs in Greece and Cyprus related to the field of Cultural Heritage and offered by University Institutes and Technological Educational Institutes (TEI) that are state-accredited.[5]We have examined the postgraduate programs in heritage and museum studies that are "vocational in intent and lead to informed practice" (Knell, 2005, pp. 3) but not those focusing on more specialized fields, such as Fine Arts, Archaeology, Theatre Studies etc (Table 1).

University		Department	Program Title	Foundation Year
1	AristotleUniversity of Thessaloniki	School of Architecture School of Civil Engineering School of Rural and Surveying Engineering School of Mechanical Engineering School of Electrical and Computer Engineering School of Chemical Engineering	Protection, Conservation and Restoration of Cultural Monuments	1998
2	National Technical University of Athens	School of Architecture School of Chemical Engineering School of Civil Engineering School of Rural and Surveying Engineering	Protection of Monuments/ specialization: Conservation and Restoration of Historic Buildings and Sites	1998
3	Panteion University of Social and Political Sciences	Department of Communication, Media and Culture	Communication,Media and Cultural Management/ specialization: Cultural Management	2001
4	Aristotle University of Thessaloniki University of Western Macedonia in Florina.	School of Architecture School of Mechanical Engineering School of Pre-school Education School of Elementary Education	Museology-Cultural Management	2001
5	National and Kapodistrian University of Athens	Department of History and Archaeology Faculty of Geology and	Museum Studies	2003

[5]We have not included in our examination degrees from private institutions/colleges in Greece, because they are not officially recognized as equivalent to their public counterparts. By way of contrast, private institutions in Cyprus are recognized by law as equivalent to public universities and as such, they have been included in our study.

	University of West Attica	Geoenvironment Department of Conservation of Antiquities and Works of Art		
6	University of the Aegean	Department of Cultural Technology and Communication	Cultural Informatics and Communication	2003
7	Hellenic Open University	Social Sciences	Cultural Organizations Management	2004
8	National and Kapodistrian University of Athens University of Patras Aegean University	Department of History and Archaeology Department of Architecture Department of Cultural Technology and Communication	Management of monuments: Archaeology, Urban Planning and Architecture	2007
9	Harokopio University	Department of Home Economics and Ecology	Education and Culture/ specialization: Cultural Education	2007
10	AristotleUniversity of Thessaloniki	School of Journalism and Mass Communications	Journalism and Mass Media Communication/ specialization: Communication and Culture[6]	2008
11	Athens University of Economics and Business University of Kent	Department of Management Science and Technology Department of Marketing and Communication School of European Culture and Languages	HeritageManagement	2011
12	International Hellenic University	Economics, Business Administration & Legal Studies	Art Law and Arts Management	2011
13	University of Peloponnese	Department of History, Archaeology and Cultural Resources Management	Administration and promotion of cultural resources and environment	2014
14	University of Thessaly	Department of Planning and Regional Development and the Department of Economics	Tourism and Cultural Planning Development	2014
15	University of Peloponnese Demokritos Research Centre for Nuclear Research National Observatory of Athens	Department of History, Archaeology and Cultural Resources Management National Center for Scientific Research Demokritos National Observatory of Athens.	Cultural Heritage Materials and Technologies	2015
16	Harokopio University	Department of Home Economics and Ecology	Sustainable Tourism Development: Cultural	2017

[6]The program's new title is "Cultural Management and Communication", https://www.jour.auth.gr/?page_id=190. Last accessed 16 December 2019

	Aegean University Paris I – Panthéon Sorbonne (IREST) University	Department of Geography Department of Informatics and Telematics Department of Business Administration Institute de Researche et d' Études Supérieures du Tourisme	Heritage, Environment, Society	
17	University of West Attica	Department of Conservation of Antiquities and Works of Art	Conservation of Cultural Heritage	2017
18	Ionian University	Department of Archives, Library Science and Museology	Management of Cultural Information	2018
19	University of Piraeus	Department of Informatics	Digital Culture, Smart Cities, IoT and Advanced Digital Technologies	2018
20	University of Ioannina	Department of Fine Art and Arts Sciences	Curation: Theoretical and Practical approaches	2018
21	Frederick University (Cyprus)	School of Engineering	Conservation and Restoration of Historical Structures and Monuments (specializations Architecture and Civil Engineering)	2013
22	Open University of Cyprus	Faculty of Humanities and Social Sciences	Cultural Policy and Development	2014
23	University of Cyprus	Department of Civil Engineering and Mechanical Engineering. Environment (Polytechnic School), Department of Architecture (Polytechnic School) Department of History and Archeology (School of Philosophy)	Conservation and Restoration and of Historical Buildings and Complexes (specializations, Civil Engineering, Architecture, Archaeology)	2017

Table 1: Cultural Heritage Postgraduate Programs in Greece and Cyprus

We extracted information on the 338 modules currently offered by the 23 postgraduate programs on cultural heritage from the curricula posted on the universities' websites, between February 2018 and November 2018.[7]We focused on the titles and descriptions of the modules, as they are directly related to how each program envisions its specialized focus and/or type of expertise(Uchiyama &Radin 2009).We proceeded by entering all data in SPSS (Statistical Package for the Social Sciences) to produce descriptive statistics (such as frequencies and crosstabulation) and then moved to the creation of visual maps/charts in order to assess the relationships between different set variables.

[7] The information on the program "Curation: Theoretical and Practical Approaches" offered by the University of Ioannina was extracted in November 2019 and updated information on all programs in December 2019.

1.3.2 Results and Discussion

A map was produced from the information collected from the total number of postgraduate programs (20 programs in Greece and 3 in Cyprus), showing all taught modules and their corresponding subject areas. The analysis of the key terms and phrases used in the modules' titles and descriptions, formed 18 clusters of subject areas. The aim of this mapping exercise was to compare the subject areas taught in all postgraduate degrees (Table 2). 13 programs out of 23 (57%) offer at least one module in the subject are of 'New Technologies"; 8 programs out of 23 (35 %) offer are least one compulsory module and 5 programs out of 23 (22%) offer at least one optional module. The modules can be further divided in 2 sub categories: those of a more generic nature and those of a specialist and technical nature (Tables 3 and 4). The titles of the modules reflect an increasing focus on the theories and technical ramifications (such as documentation) of digital heritage.

		History- Cultural Theory	Management-Economics	New Technologies	Conservation-Protection	CollectionManagement	Curating	Educational Programs	Tourism	Legislation-Cultural Policy	Architecture	Communication-Audience	Environment	Archaeology	Museology	Multi-subjectmodules	Research Methodology	Specialised Technical topics	Other Cultural topics	Total
1	**Protection,Conservation and Restoration of Cultural Monuments**	5	0	2	18	1	0	0	0	2	5	0	2	1	1	0	1	18	0	56
2	**Protection of Monuments/ specialization: Conservation and Restoration of Historic Buildings and Sites**	1	2	1	2	0	0	0	0	1	4	0	0	1	1	1	0	0	1	15
3	**Communication, Media and Cultural Management/ specialization: Cultural Management**	4	3	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	2	13
4	**Museology-Cultural Management**	1	1	0	0	0	0	1	0	0	1	0	0	0	2	0	0	0	0	6
5	**MuseumStudies**	1	2	1	3	1	0	1	0	1	2	1	0	0	1	2	0	0	0	16
6	**Cultural Informatics and Communication**	0	3	15	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	20
7	**Cultural OrganizationsManagement**	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	4
8	**Management of monuments: Archaeology, Urban Planning and Architecture**	0	2	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	6	20
9	**Education and Culture/ specialization: Cultural Education**	2	0	1	0	0	0	3	2	0	0	0	1	0	0	0	1	0	2	12
10	**Journalism and Mass Media Communication/ specialization: Communication and Culture**	3	1	1	0	0	0	0	0	2	0	4	0	0	0	0	2	0	4	17
11	**HeritageManagement**	0	4	0	0	0	0	0	0	0	1	1	0	1	0	4	0	0	0	11
12	**Art Law and Arts Management**	0	2	1	0	0	0	0	0	8	0	1	0	0	0	0	0	0	0	12

13	**Administration and promotion of cultural resources and environment**	1	5	1	2	0	0	0	0	2	0	1	0	0	0	2	0	0	1	15
14	**Tourism and Cultural Planning Development**	1	3	0	0	0	0	0	3	0	0	1	0	0	0	1	1	0	5	15
15	**Cultural Heritage Materials and Technologies**	0	0	2	0	0	0	0	0	0	0	0	1	2	0	2	0	1	0	8
16	**Sustainable Tourism Development: Cultural Heritage, Environment, Society**	0	2	0	0	0	0	0	3	0	0	1	0	0	0	2	1	0	0	9
17	**Conservation of Cultural Heritage**	1	1	1	6	0	0	0	0	0	0	0	0	0	0	0	1	1	0	11
18	**Management of Cultural Information**	1	2	0	1	2	0	0	0	1	0	1	0	0	1	0	1	0	4	14
19	**Digital Culture, Smart Cities, IoT and Advanced Digital Technologies**	0	1	7	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	10
20	**Curation: Theoretical and Practical approaches**	2	1	1	0	0	6	1	0	0	2	0	0	0	0	2	0	0	0	15
21	**Conservation and Restoration of Historical Structures and Monuments**	0	0	0	4	0	0	0	0	0	0	0	0	0	0	3	1	6	0	14
22	**Cultural Policy and Development**	2	2	0	0	0	0	0	0	1	0	1	0	0	1	2	0	0	0	9
23	**Conservation and Restoration and of Historical Buildings and Complexes**	1	0	0	0	0	0	0	0	0	3	0	0	3	0	6	0	3	0	16
	Total Number of Modules	**27**	**38**	**38**	**36**	**5**	**7**	**6**	**8**	**21**	**22**	**13**	**4**	**12**	**9**	**28**	**10**	**29**	**25**	**338**
	Number of Postgraduate Programs out of 20 that offer at least one module	**15**	**18**	**13**	**7**	**4**	**2**	**4**	**3**	**10**	**8**	**10**	**3**	**6**	**8**	**12**	**9**	**5**	**7**	

Table 2 Modules offered by the postgraduate programs of study on cultural heritage in Greece and Cyprus: arranged by subject area

Program	CompulsoryModules
MuseumStudies	New Technologies and Museums
Cultural Informatics and Communication	2D Graphics I-II
	3D Graphics I-II
	Audiovisual Media and Exhibitions
	Culture and Digital Media I-II
	Developing Games and Applications in Virtual Reality Environments
	Mobile Technologies
	Pervasive Computing I-II
	Programming I-II
Education and Culture	Cultural Technology
Art Law and Arts Management	Digitality and the Arts
Cultural Heritage Materials and Technologies	Computing Practices: GIS, Statistical Analysis and Computing Aided Applications
	Field Prospection and Computing Technologies for Cultural Heritage
Conservation of Cultural Heritage	Digital three-dimensional imaging techniques
Digital Culture, Smart Cities, IoT and Advanced Digital Technologies	Advanced Information Technologies for Monument Management
	Advanced Media Technologies and Applications in Contemporary Culture and Heritage
	Cultural Analytics - Signal Processing and Services for Cultural Applications
	Intelligent Mixed Reality and e-Culture
	Sustainable cultural development for digital cities
	Urban Design of Digital Cities
	IoT and Mobile Applications for Digital Culture
Curation: Theoretical and Practical approaches	Exhibitions and New Technologies: digital learning environments and virtual worlds. Digital curation of collections

Table 3 List of compulsory ICT modules

Program	OptionalModules
Protection, Conservation and Restoration of Cultural Monuments	Exploitation and projection of the monuments of civilization – Multimedia
	Photogrammetry, 3D scanning technology and space information systems for the documentation of existingmonuments
Protection of Monuments/ Conservation and Restoration of Historic Buildings and Sites	Digital Recording and Documentation Methodology
	Special Issues in Digital Cultural Management and New Technologies
Management of Monuments: Archaeology, Urban Planning and Architecture	Digital Cultural Management and New Technologies 1-3
Journalism and Mass Media Communication/Specialization Communication and Culture	New Technologies and Cultural Organizations
Administration and Promotion of Cultural Resources and Environment	Cultural Resources, Environment and New Technologies

Table 4 List of optional ICT modules

Programs 5, 6, 8, 9, 10, 12, 13 and 20 (Table 1) offer condensed and introductory modules on digital heritage; for example, Program 8 offers 3 modules on *Digital Cultural Management and New Technologies*, and Program 5 offers the module *New Technologies and Museums* (Tables 3 and 4). This indicates the pressing need to offer general and all-embracing courses so that students may get acquainted with the wide variety of potentials that digital media offer in cultural heritage practice. Digital Technologies are emerging as a core subject area within academic curricula (13 programs out of 20 postgraduate programs of study) in Greece, a phenomenon however, that is not attested in the case of Cyprus. Although researchers are actively engaged with digital heritage, and if we consider that similar working conditions exist in Cyprus due to the financial crisis of 2013 (Economou *et al*, 2017), the lack of modules on digital technologies in the postgraduate programs of study produces a crucial gap between academic training and the professional sector. Digital technologies in the academic curricula of the Cypriot institutions appear as a topic of secondary importance within modules regarding the protection of tangible cultural heritage.

Programs 1, 2, 15 and 17 (Table 1) focus on the conservation and protection of tangible cultural heritage and offer modules on digital skills that directly refer to a specific set of technical competencies (Tables 3 and 4); for example, Program 1 offers the module *Digital recording and documentation methodology* (Table 4). Cook and Hill (2018) note that in archaeology and heritage, emphasis is still placed on digital tools for recording/archiving rather than interpretation (Cook and Hill 2018). In the cases of Greece and Cyprus, this also reflects the close relationship between the meticulous recording of empirical data and cultural heritage. Classical antiquity, in being the par excellence symbol of the nation-state, offers territorial and historical continuity in both countries and the state-governed heritage management prioritizes cultural policies or schemes that focus on its material manifestations (Bounia& Stylianou-Lambert, 2011; Gazi, 2011).

Programs 5, 10, 12 and 13 (Table 1) offer at least 1 module in the subject area of Communication-Audience Engagement (Table 2).This is in agreement with the increasing dominance of digital communication in cultural communication and marketing. As Kyprianos*et al* have noted “scholars observe that our mediated, networked reality is subject to non-linear, non-hierarchical, hybrid processes of mediated, online interactions among information consumers and broadly defined media content” (2019, pp. 2). These hybrid processes have empowered different communities or individuals to advance their agendas and in doing so, hybrid media ecosystems created the space for discussions that criticized established social, political and epistemological structures of power (Bounia, 2018). The production of meaning through the active interaction of different users and heritage institutions in digital platforms, is considered one of the most important changes brought by digital media (Theodosiou&Papadaki, 2018).At the same time the numbers of Greek visitors in museums are decreasing, a significant factor of which is the changing structure of Greek society due to the severe recession: there is a rapid marginalization of people (10 % of the population) based on ethnicity (such as migrants) and low income. Here we should add communities with special needs and capacities, which require different types of access to heritage sites (Papadimitriou *et al*, 2016). As a result, a growing number of the Greek population cannot follow “the cultural expression and activities that take place in museums

and arts institutions" (Garezou&Keramidas, 2017, pp. 23). These different communities create multifaceted target audiences; digital platforms have the potential of acquiring a powerful role in the rapid (if not instant) connection of heritage institutions with their audiences.

1.4 Conclusions

The incorporation of the digital in cultural heritage management offers opportunities for exchange, accessibility, diversification of experience, participation and negotiation of traditional values and perception concerning the past. However, a crucial concern/challenge is that the digital now pervades cultural heritage operations and strategic visions but the gap between the professional sector and formal training is widening due to the speed of digital change (Barnes *et al*, 2018; Carvalho & Matos, 2018). Royston and Parry (2019, pp. 39) argue for the need of a shared terminology on digital skills to close the gap: *digital competency* (i.e. "what I do with digital" and how I use a digital tool); *digital literacy* (i.e.how I approach the digital and how my actions relate to the professional sectors' expectations); finally, *digital capability* (what and how I achieve with the digital). In doing so, a shift from the training offered by formal education can be attempted so that museum professionals acquire "digital literacy-competency-capability" instead of "technical skills". This is a radically new framework for the cultural heritage workforce as the foregoing triad is not a mere "add-on" to the specialists' primary role and purpose, but an essential element of their identity. It is for this reason precisely, that further training is urgently required, albeit from a new, critical and forward-looking perspective.

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