

A CRITICAL READING TOOLKIT FOR THE USE OF DIGITAL MUSEUMS AND MUSEUM WEBSITES AS PROVIDERS OF KNOWLEDGE IN EDUCATION

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Abstract.

Museum objects, entities and ideas are much more accessible today by diverse communities due to the increasing use of digital technologies. Among these communities students are a very important target group. The issue of the Provenance of Knowledge is also crucial to modern education. Museums can contribute in this direction since they can provide evidence not only to detect the origin of school knowledge but also to substantiate it. New technologies create, in addition, new conditions and challenges. Digital museums and museum websites for children bring museums into the classroom. At the same time, they create a new framework for knowledge and its documentation reinforcing experiential participation. This education though is neither neutral nor innocent. It is determined by specific ideological discourses about the present and the past. Moreover, it follows certain learning theories and pedagogical principles included in school curricula. In this context a tool for an effective “reading” of these digital environments is needed. This reading tool must be flexible to trace the creation, use, interpretation and dissemination of the respective mediated information and knowledge. The present paper proposes the use of an analogous reading toolkit for digital museums and museum websites. This toolkit comprises ten criteria and takes into account the ways in which meaning can be derived from their content, the ideological and socio-cultural “purpose” they serve, their underlying pedagogical principles, and the added value obtained from the educational use of ICT.

Keywords: ICT, education, digital museums, critical reading

1 Objects, museums and education in the new digital knowledge environment

During the last two decades there was a widespread use of multivariate activities concerning public engagement in museums and museum education (Gazi 2007, Tsipopoulou 2008, Merriman 2017). Teaching and learning through and from objects has been a crucial prerequisite of these activities. Museum objects are nowadays considered as powerful mediators to teach lessons, to make arguments and to extract meaning about the world (Geismar 2018). As a result, the pedagogical added value of their use in formal and non-formal education is also a matter of great importance. Moreover, the entanglement between humans and things is a central issue in many disciplines of contemporary academic research including archaeological theory (Hodder 2016), material culture studies (Hicks 2010, Robb 2015) and museum practices (Pearce 1990, Dudley 2012). Meanwhile, recent trends in Public Archaeology raise the issue of more “people-focused” than “object-centered” perspectives (Okamura 2011).

Following traditional museological approaches, museums are designed to educate their audience and to shape attitudes and values about the past. They are responsible not only for the (re)construction of the past but, also, for their audience’s perceptions about it (Nikonanou et. al. 2015, Merriman 2017, Hohenstein and Moussouri 2018). Today, museums are much more accessible by diverse communities due to the increasing use of digital technologies. Among these communities children as World Wide Web users, are a very important target group. Children are recognized as a significant heritage audience (Smith 2013, 107) and their involvement with museums as “experience seekers” (Cesario et. al. 2017) is recognized as one of the crucial factors for the success of the main objective for an “engaging museum” (Black 2005, 157-173). The application of pedagogical theories, such as constructivism (Hein 1998), in the museological approaches has led to a close relation and interaction between pedagogy and museums. As a result museum learning is considered to be a

crucial dimension of museum practice (Hohenstein and Moussouri 2018), taking into account, at the same time, that dealing with museums is in fact an action of political significance (Gray 2015).

It cannot be overlooked that the above approaches about museums and their audiences are now determined by an additional parameter. The use of Information and Communication Technologies (ICT) in museum educational programs is recognized as a powerful tool for the accomplishment of museum's objectives (Bounia et al. 2010, Savva 2013). The establishment of distance communication between the museum and the public through the World Wide Web is an almost inevitable event. At the same time, the ever-increasing digitization of files and objects creates a significant digital reserve ready to use, available in a variety of digital cultural portals and repositories. Many museum experts recognize today the need for the development of new skills (Mercer 2011) in the study of tangible and intangible Digital Heritage and its integration in education (Ott and Pozzi 2008, Hirsch 2012, Economou 2015), while others emphasize on the need to develop "museum - based multiliteracies" (Savva 2013).

Undoubtedly, the role of ICT in engagement with the past is of crucial importance since that it is a "process of manipulation and translation, of mediation and interaction" (Shanks 2007, 274, 282), especially if someone consider that they also act as "socioeconomic assets for the development of cultural resources" (Missikoff 2006). It is worthwhile, thus, and especially for those involved in managing digital heritage, to have always in mind concerns about whether the new digital tools "just put a modern sophisticated look on very traditional and conservative interpretations of the past" (Economou 2015, 217).

At the same time, Semantic Web and the modern demand for interoperability raise additional concerns for the interconnection between heritage institutions. In this situation, transparency, i.e. the need to define were content comes from is considered among the key elements of the European Area of digitized cultural (re)sources (Missikoff 2006, 154). Furthermore, novel digital technologies like for example Augmented Reality, Intelligent Environments or Intelligent Intuitive Interfaces, will alter human experience. We must be ready for new learning environments, like human-computer interaction on brain computer and vision based interfaces without the need of a traditional computer ("Disappearing Computer"), the need for contextual information and ambient intelligence, the mixture of natural interfaces and embodied cognition with evocative/smart objects that will completely transform our educational experiences.

2 On a critical reading toolkit

In this interconnected, interdisciplinary and interoperable context a tool for an effective reading of online museum digital environments is needed. Its aim is to be a contextual, reflective and flexible tool to trace the creation, use, interpretation and dissemination of the information and knowledge provided as they arise through the mediation of digital museums and sites (Touloumis 2017). It is based on the archaeological and museological theories about the ways the past is represented, signified and interpreted by different communities (Merriman 2017), and the correlation of these theories with the socio-political theories of language, discourse and communication, like Critical Discourse Analysis and Social Semiotics (Dijk 1993), and Multimodality (Kress 2010).

This toolkit is consisted of ten criteria (Pl. 1, Fig. 1). These criteria are not evaluative and should be addressed as a means of holistic viewing and reading digital environments regarding provenance of knowledge. The first four criteria are about the identity of the under study digital museum or museum site. Their main aim is to consider the credibility, authenticity and accessibility of these sites as providers of digital (re)sources. They define the type of the website as well as the type of the museum or heritage institution that manage, create and transmit knowledge through it identifying also its theme and the respective digital content. Finally, they determine the accessibility, if it is free or after any kind of subscription, of the potential user.

Criterion	Concerning
1	Type and Profile of the site
2	User Access
3	Subject
4	Content
5	Ideational Metafunction
6	Interpersonal Metafunction
7	Textual Metafunction
8	Sociopolitical and Cultural Context
9	Pedagogical Context
10	Value of ICT use

Pl. 1. The criteria of the critical reading toolkit

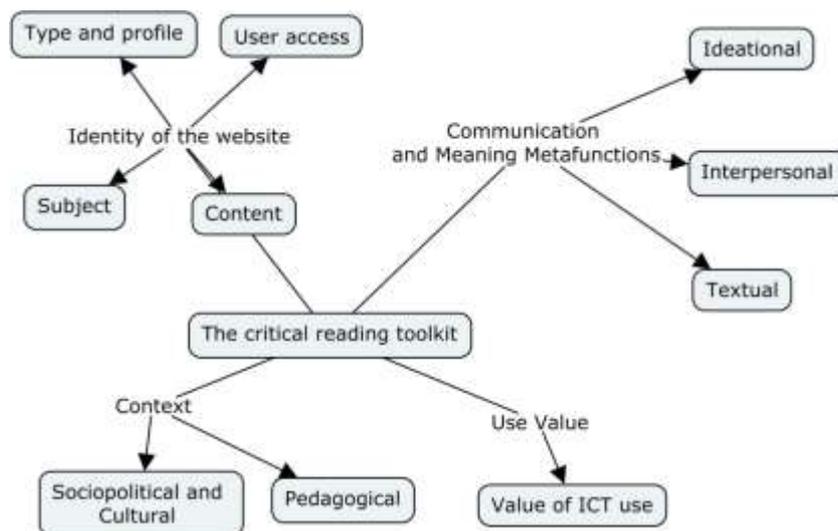


Fig.1. Analysis of the critical reading toolkit

The Criteria 5th – 7th are about the cognitive and the ideological principles of the specific digital museums or websites. They are based on Multimodal Communication theory and the hypothesis that three

metafunctions, the ideational, the interpersonal, and the textual, construe meaning in communication (Kress and van Leeuwen 2006) In our case, Ideational Metafunction refers to the pedagogic recontextualization of knowledge (Singh 2002) in digital museums through the selection and the presentation of certain digital surrogates of museum objects. In this case it is interesting to approach meaning production through specific choices in the visual design of a site regarding the use of narrative, taxonomic, analytical and symbolic representations,. On the other hand Interpersonal Metafunction integrates the user's look, and concerns his perception of the meaning derived by his/her interaction with the producer's messages. The Textual Metafunction, finally, is constructed by words, colors, images, sounds, and the relationship between them identifying the way they constitute the structure of the digital environment as a "text" of any kind.

In the digital application on the Parthenon Frieze (The Parthenon Frieze n.d.), for example, developed by the Hellenic Ministry of Culture and the National Documentation Centre, narrative, taxonomic, analytical and symbolic (re) presentations are used to guide the digital visitor to his/her tour on the site (Touloumis 2017, 68-75). There is a visual dominance of the Parthenon and the representations of the frieze, while the written texts, the colors and the interconnected audiovisual media create an evocative framework, providing, at the same time, information, description of the marble blocks and thematic tours, in order to enhance learning about the frieze. So the young user, despite the intrinsic interactivity of the digital medium, is treated in the same way as a visitor to a real museum, as an object and not a subject of learning.

The 8th Criterion is about the Sociopolitical and Cultural context, the ideology and the underlying, respective "discourses" that dominate the museums' digital narratives about the past. The majority of Greek archaeological digital museums and websites, for example, are rather "mirrors" of their genuine museums. They integrate and reflect their goals and their ideological background. They use ICT in a primarily instrumentalist way to attract more visitors displaying the "uniqueness" of their exhibits and to provide knowledge through their webpages targeting, among other communities, young people. They reproduce the traditional, already established in school textbooks and curricula, approaches and perceptions about the Hellenic identity and the singularity of the Greek past (Damaskos and Plantzos 2008).

The knowledge about antiquity is considered as an unchanging, almost "sacred" knowledge that has just to be passed on to students. Furthermore, these approaches gain more value and reliability since the provided by official museums knowledge is communicated in a more modernized, multimodal, spectacular and evocative way. The use of ICT seems, mostly, to reproduce and reinforce the already established student identities as far as their perception of the past is concerned, since it does not lead to critical historical awareness. It also does not encourage students to adopt a critical stance towards the past or to shape their own historical perceptions. In this way the observed musealisation of the museum objects as static visual stimuli (Chourmouziadi 2017) not only remains present but also perpetuated.

The 9th Criterion refers to the pedagogical dimension, the underlying pedagogical discourses of the specific digital museums or websites. In this case, the crucial issues are related to the adequacy of the digital environment for potential classroom use. Learning theories, educational goals and objectives, the actions and roles of teachers and students in pedagogical contexts (issues of authority and guidance or of participation and engagement, interactivity etc.), the opportunities they offer for group collaborative teaching are all significant for the efficient use of these sites. Several types of children / users activities of learning through the Internet and interactive media have been identified so far (Schaller et. al. 2002). Young users of these environments, usually, practice their creativity by drawing pictures and making stories or animations, they tour with the guidance of an expert or explore various topics acting in an interactive environment choosing hyperlinks, in the form of words and images. They handle puzzles to solve mysteries through answering questions based on the museum collections' data set. They even participate in role-playing games or simulations acting as certain characters and observing the consequence of their own paths in this game.

It is obvious that the majority of these activities are connected with constructivist and socio-cultural theories. However, to engage the public, and especially youth to heritage matters using these museum web pages is a complex process (Teather and Wilhelm 2013). It is very important to approach not only the presented museum objects themselves, but also the aims of the administrating museum, and, finally, how the "virtual visitor" participates interactively in the whole project. Some digital museums and websites propose traditional learn and play activities in the form of drill and practice games. Other organize interesting role playing games based on the use of the museum's collections, causing visitors to active participation, to design their own collections and ultimately to express their social identities. "Play with the Frieze" suggests, for example, to the young users the educational website of the Parthenon Frieze (The Parthenon Frieze n.d.). By clicking the link, new hyperlinks in the form of a package, like a museum kit, lead them to puzzles and matching images games. "Become a museologist, choose the objects and create your own online exhibition" is the urge in the site of the Byzantine and Christian Museum Virtual Museum of Athens (Byzantine and Christian Museum n.d.). "Create your own Rijksstudio" induce its visitors the Rijksmuseum's site (Rijks Museum n.d.). In this situation the visitor has his / her own space in the digital environment and operates as a curator of his/her own exhibition participating in collaborative activities with other users.

The added value of ICT use (10th criterion) is thereby essential for this approach. More specifically, it argues for the need to emphasize on the pedagogical benefits for the young user of these environments. Thus, questions about the learning theory that governs each digital environment, the provided tasks for teachers and students, the required skills and literacies, or whether they provide an environment suitable for self-identity expression, are very crucial. These questions will help to detect and finally overcome what has been described as "instrumentalist strategy" in the use of ICT (Bulfin and Koutsogiannis, 2012), that is the tendency to use ICT as tools for a new and modernized presentation and manipulation of knowledge and not as a means of reading and interpreting the world. Subsequently, the identification of the type of the digital learning environment, if it is behavioral or constructivist or any other, for example, as well as the recognition of the supported by this learning environment teaching strategies and practices and, finally, the determination of the type of the learner subject they produce are decisive parameters of any approach to the use of ICT.

3 Concluding remarks

Digital museums and websites are active agents in the modern sociopolitical, cultural and pedagogical discourses about the past and its teaching. The present paper has attempted to provide a reading toolkit for a thorough study of the respective digital environments. Despite this toolkit is not evaluative it could contribute to the critical reading of educational (re)presentations and recontextualizations about the past, since it encompasses multivariate criteria that emphasize on digital museums as knowledge providers. In addition, it incorporates pedagogical principles and perceptions which are considered necessary for reading similar environments. The issue of the provenance of knowledge in education thus is treated in a multidimensional way. This toolkit it could be thereby useful for reading any kind of digital museum and any modern digital environment either for online or for mobile learning from virtual tours and explorations to augmented reality applications. It provides their critical reading since it traces and shed light on their dominant sociopolitical and ideological background discourses. In the same manner it identifies the value of ICT use by treating them also as a product of analogous discourses. In this way ICT are not only considered as neutral and innocuous tools devoted to an attractive, fascinating or extraordinary presentation of knowledge.

Therefore, the interdependent last three criteria of this toolkit are the most essential for the present study. They are, in fact, at the base of all the other criteria and raise two important issues regarding teaching the past as a sociopolitical and cultural action in the present. They highlight the sociopolitical involvement of the perceptions and the narrations of the past and the fact that these narrations are based on preexisting dominating modern interpretations about it (Stapleton and Willson 2017), which, most of the time, are perceived as given and as the only ones that may exist. In this context the awareness of how the past is interpreted and symbolized in the present is much more important than acquiring, even continually shared and updated, encyclopedic knowledge about the past based on "pure" data. The main question of the present study is thereby how we will

shape the students' teaching in a way that will make them get involved not only in the process of learn about the past but also in the process of understanding how historical knowledge is produced and manipulated through ICT in the present. Reading the past in a digital context is a necessary step to accomplish this goal.

Subsequently, the future of using ICT to teaching the past is obviously not in the modernization of the media, or in the increasingly renewed technologies and even not in the abundance, availability and interoperability, due to the new Semantic Web, of digital resources. In the case of digital museum resources and their use in education the need of taking a user – centered approach by museum professionals (Marty 2008), and educators, is obvious Students must enhance their ability to read, interpret and give meaning to the surrounding world having the appropriate critical tools at their disposal.

In conclusion, digital museums and museum websites bring museums into the classroom. They create a new framework for knowledge and its documentation reinforcing experiential participation. This education though is neither neutral nor innocent. It is determined by specific ideological discourses about the present and the past. Moreover, it follows certain learning theories and pedagogical principles usually included in school curricula together with established perceptions of the past reproduced through museums. It is necessary, though, the issue of the Provenance of Knowledge and of the way museums use documentation in the digital cultural resources used by students in educational context to learn about history, past and heritage, to be major concerns for all respective professionals. Developing critical approaches and critical tools is an undeniable task. In this context, there are a lot of new challenges for educational institutions of all levels and especially for schools to involve students in learning through museums. Such tools could be used by professionals, specialists, researchers, educators and students as meaning – making resources for reading and accessing issues not only on the provenance of knowledge but also on how museums and their narratives are involved in the public perceptions of the past.

Bibliography

Bounia, Alexandra., Maria Economou, and Evgenia - Maria Pitsiava. 2010. "The use of new technologies in museum educational programmes: Results from research in Greek museums". In *Museums and Education*, edited by Billie, Vemi, and Eirini Nakou, 335-47. Athens: Nesos Publications. (In Greek).

Bulfin, Scott, and Dimitris Koutsogiannis. 2012. "New literacies as multiply placed practices: expanding perspectives on young people's literacies across home and school". *Language and Education* 26, no.4: 331-346.

"Byzantine and Christian Virtual Museum". n.d. <http://www.ebyzantinemuseum.gr/> . Accessed 30 July 2018. <http://www.ebyzantinemuseum.gr/?i=bxm.en.games>.

Cesário, Vanessa, António Coelho, and Valentina Nisi. 2017. "Teenagers as Experience Seekers Regarding Interactive Museums Tours". In *International Conference on Design and Digital Communication*. Accessed July 2018. <http://www.digicom.ipca.pt/>.

Choutmouziadi, Anastasia. 2017. "The deadlock of museum images and multisensoriality". *Punctum*, 3, no. 1: 45-56.

Damaskos, Dimitris, and Dimitris Plantzos, eds. 2008. *A Singular Antiquity. Archaeology and Hellenic Identity in twentieth – century Greece*. Athens. Mouseio Benaki.

Dijk, van, Teun, A. 1993. "Principles of Critical Discourse Analysis". *Discourse and Society* 4, no 2, 249-83. <https://doi.org/10.1177/0957926593004002006>.

Dudley, Sandra, ed.. 2012. *Museum Objects: Experiencing the Properties of Things*. Leicester Readers in Museum Studies.

- Economou, Maria. 2015. "Heritage in the Digital Age". In *A Companion to Heritage Studies*, edited by William Logan, Mairead Nic Craith, and Ulrich Kockel, 215-28. John Wiley & Sons, Inc.
- Gazi, Andromachi. 2007. "Exhibiting the Past to Children". In *Telling Children about the Past: An Interdisciplinary Perspective* edited by Nena Galanidou, and Liv Helga Dommasnes, 204-25. Ann Arbor: International Monographs in Prehistory.
- Geismar, Haidy. 2018. *Museum Object Lessons for the Digital Age*. London: UCL Press.
- Gray, Clive. 2015. *The Politics of Museums. New Directions in Cultural Policy Research*. Palgrave Macmillan, London
- Hein, George. 1998. *Learning in the Museum*. London: Routledge.
- Hicks, Dan. 2010. "The material-cultural turn: event and effect". In *The Oxford Handbook of Material Culture Studies*, edited by Dan Hicks, and Mary C. Beaudry, 25-98. Oxford: Oxford University Press,
- Hirsch, Brett. D., ed.. 2012. *Digital Humanities Pedagogy. Practices, Principles and Politics*. Open Book Publishers.
- Hohenstein, Jill and Theano Moussouri. 2018. *Museum Learning. Theory and Research as Tools for Enhancing Practice*. Rourledge.
- Kress, Gunther, R. and Theo Van Leeuwen. 2006. *Reading Images: The Grammar of Visual Design*. Routledge.
- Kress, Gunther, R. 2010. *Multimodality: A Social Semiotic Approach to Contemporary Communication*. New York: Routledge
- Marty, Paul. F. 2008. "Museum websites and museum visitors: digital museum resources and their use". *Museum Management and Curatorship* 23, no1. 81-99. <https://doi.org/10.1080/09647770701865410>
- Mercer, Colin. 2011. "Which skills for culture in a globalised and digitised world?" *European Expert Network on Culture (EENC) Paper*, October 2011. Accessed July 30, 2018
<http://www.interarts.net/descargas/interarts2579.pdf>.
- Merriman, Nick. 2017. *Beyond the Glass Case: The Past, the Heritage and the Public*. Routledge. Second Edition.
- Missikoff, Oleg.. 2006. "Assessing the Role of Digital Technologies for the Development of Cultural Resources as Socio-economic Assets". In *Images, Representation and Heritage*, edited by Ian Russel, 139-59. Springer
- Mirra, Nicole, Ernest Morrell, and Danielle Filipiak. 2018. "From Digital Consumption to Digital Invention: Toward a New Critical Theory and Practice of Multiliteracies". *Theory into Practice*, 57, no.1, 12-19,
- Nikonanou, Niki, Alexandra Bounia Alexandra Filippopoliti, Anastasia Chourmouziadi, and Nikoletta Yiannoutsou. 2015. *Museum Learning and Experience in the 21st century* . <https://repository.kallipos.gr>
Accessed July 30, 2018: <http://hdl.handle.net/11419/712> (in Greek).
- Okamura, Katsuyuki. 2011. "From Objects-Centered to People-Focused". In *New Perspectives in Global Public Archaeology* , edited by Katsuyuki Okamura, and Akira Matsuda, 77-86 . Springer.

Ott, Michela, and Francesca Pozzi. 2008. "ICT and Cultural Heritage Education: Which Added Value". In *Emerging Technologies and Information Systems for the Knowledge Society.*, edited by Militiadis. D. Lytras, John, M. Carroll,., Ernesto Damiani., and Robert, D. Tennyson, 131-8. First World Summit on the Knowledge Society Proceedings, WSKS 2008. Springer.

Pearce, Susan, ed.. 1990. *Objects of Knowledge*. New Research in Museum Studies. London and Atlantic Highlands: The Athlone Press.

"Rijks Museum" n.d. <https://www.rijksmuseum.nl/en>. Accessed 30 July 2018. <https://www.rijksmuseum.nl/en/rijksstudio?ii=0&p=2&from=2018-07-06T05%3A50%3A26.5160795Z>

Robb, John. 2015. "What Do Things Want? Object Design as a Middle Range Theory of Material Culture". *Archaeological Papers of the American Anthropological Association*, 26, no. 1, 166-80. <https://doi.org/10.1111/apaa.12069>

Savva, Stephania. 2013. "Museum-based Multiliteracies and Learning for 21st Century Skills: A Preliminary Study". *The International Journal of the Inclusive Museum*, 6 : 117-130.

Schaller, David T., Steven Allison-Bunnell, Minda Borun and Margaret B. Chambers. 2002. "How do you like to learn? Comparing User Preferences and Visit Length of Educational Web Sites", *Museums and the Web*. Accessed 30 July 2018: <http://www.archimuse.com/mw2002/papers/schaller/schaller.html>

Shanks, Michael. 2007. "Digital media, agile design and the politics of archaeological authorship". In *Archaeology and the Media*, edited by Timothy Clack, and Markus Brittain, 273-89. New York: Routledge.

Singh, Parlo. 2002. "Pedagogical Knowledge: Bernstein's Theory of the Pedagogic Device". *British Journal of Sociology of Education*, 23, no. 4, 571-582

Stapleton, Karyn, and John Wilson. 2017. "Telling the Story: Meaning Making in a community narrative". *Journal of Pragmatics* 108, no.1, 60-90. Accessed 30 July 2018. <https://doi.org/10.1016/j.pragma.2016.11.003>

Teather, Lynn, and Kelly Wilhelm. 2013. "Web Musing: Evaluating Museums on the Web from Learning Theory to Methodology". In *Museums and the Web*. Accessed 30 July 2018: <http://www.museumsandtheweb.com/mw99/papers/teather/teather.html>.

"The Parthenon Frieze". <http://www.parthenonfrieze.gr>. Accessed 30 July 2018. <http://www.parthenonfrieze.gr/#/play/introduction>.

Touloumis, Kosmas. 2017. *ICT, Education, and the Past: A Critical Approach to Digitally Linking History and Archaeology to Education*. Master's Thesis, submitted to the Department of Education and Social Policy. University of Macedonia. Thessaloniki. Accessed 30 July 2018: <http://dspace.lib.uom.gr/handle/2159/20397> (in Greek).

Tsipopoulou, Metaxia, ed. 2008. *Digital Heritage in the New Knowledge Environment: Shared spaces & open paths to cultural content*. Proceedings of the International Conference held n Athens 31.10.08-02.11.08 2008.