Digital Heritage as a Dynamic Source in the School of Information and Knowledge: Teaching Scenarios and Applications Using Information and Communication Technologies

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Shared spaces & open paths to cultural content

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1. Introduction
The management and preservation of cultural heritage and, especially, of its digitized form, is a relatively ignored issue by the Greek formal educational system. Students usually approach the cultural heritage as historical knowledge acquisition closely related to the construction of national consciousness. This is accomplished by using, in practice, a traditional, stable educational and learning model of diachronic "value" based, mainly, on textbooks and national narratives (Hamilakis 2003), despite the declared theoretical aspirations, included in the "Official History's School Curriculum", about the need to cultivate students' historical thinking and historical consciousness. Museum educational programmes are an outlet to this situation, but they usually remain within the framework of informal education, without being linked in a meaningful way with the routine of school practice [Touloumis 2004].

The efforts made by different cultural organizations, therefore, for the adoption of current learning processes and the use of new technologies in museum education (Bounia, Nikanou and Economou 2008) could not fully succeed unless they became part of everyday school reality. This need for access to raw data that Information and Communication Technologies (ICT) can make available in the classroom was already recognized by the late 90s' in studies concerning the use of ICT in the cultural sector together with the conviction that digitized resources "will provide materials which students can use as part of exercises in developing their generic IT skills" (Economou and Ross 1998). The last decade’s consideration on informing and teaching the children about the past [Touloumis 2004; Dommasnes and Galianou 2007], in addition, has created the appropriate theoretical and practice environment for teaching archaeology in schools. In this context, digital heritage teaching or teaching with digital heritage could be a significant part of the schools' educational routine.

In the first decade of the new century, digital technologies are, usually, connected with novel and innovative methods of teaching and outreach and, with the establishment of new channels of publication and discussion on archaeology (Kris tensen 2007, 73). The introduction of teaching with ICT, according to the European Community’s “European Information Society” package and the Lisbon Strategy goals, together with the improvement of e-learning and the spread of broadband services, provide a significant occasion for making known and interpreting the digital heritage of archaeology [Doerr and Sarris 2003]. Nowadays, Web 2.0 technologies promote the spread of information and knowledge in a social way. Their first uses in archaeology have already appeared (Watrall and Siarto 2007). Teaching with ICT could link the school class with cultural organizations and, subsequentely, the students with the understanding, meaning and care of the cultural heritage management relevant projects and programmes so far summarized (Dimarkis 2004, 51) in two categories: a) experiential, where in the student acts as a person in the past, playing a certain role in an already constructed, electronic educational environment, and b) elaborative, during which the student acts as a scholar, as an archaeologist preferably, who observes, compares and classifies in order to build up his/her interpretations and to reach his/her own conclusions. These approaches are intended to be student-centred. In analogous applications, certain digital, virtual environments are constructed wherein students learn to act in different contexts. Moreover, the students learn, also, to make decisions and check their consequences, to elaborate facts and make conclusions or extract meaning based on scientific data. There is, though, a missing link. All student practices are framed within a given pre-constructed environment without many possibilities for them to intervene and construct their "own world" or to express their identities. The potential routes to follow, furthermore, are predicted by the software itself or by the combination of the given data.

2. Digital heritage resources and education: the need for a digital heritage didactic
The application of media in education is widely connected with the expansion of new didactic methods. Learning theories play a decisive role in the development of online educational activities [Schaller and Allison-Bunnel 2003]. Museums form their educational projects following constructivism [Hein 1998]. The students' identity and collaboration, as well as the socio-cultural context in which they learn, are the key-concepts of education in the new era. Co-operative learning, cross-curricular, interdisciplinary approaches and the determinative role of the student in goal setting are all outcomes of the ICT introduction in education [Cope and Kalantzis 2000; Kron and Sofos 2007].

Teaching in the new electronic environment is based on the firm belief that students nowadays act as users and producers (Kron and Sofos 2007). There is a need, consequently, for the development of a digital heritage didactic, which will take into consideration all modern pedagogical principles and all benefits deriving from the acknowledgment of the digitized cultural sources' educational value. This didactic must be flexible and student-oriented. It may assist, nevertheless, in the creation of the new literate individual, who will possess increased judgement and will also be able to use any creative means of communication and any social and cultural resources to understand the new complex reality, as it is established in the new knowledge environment.

"Being literate entails the capability to enter actively into creating, shaping and transforming social practices and universes
of meanings in search of the best and most humane of all possible worlds” (Snyder 1999).

According to Kron and Sofos (2007, 201-220), the inquiry and action-oriented media didactic plans consist of the following stages: preparation, design, interaction, presentation and assessment, while the elaboration of an action-oriented didactic plan has seven steps: developing a question, phrasing key-terms, searching, evaluating research results, producing, presenting results and, finally, evaluating students’ work. The design of goal-based scenarios (Schaller et. al. 2001), in addition, contributes a lot to the structure of teaching processes. A digital heritage didactic (Fig. 1), therefore, may follow the modern pedagogic principles and methods associated with the new educational theories, like “Design” and designing, multiliteracies and multimodality, and the goal of social meaning production in schools (Cope and Kalantzis 2000). Its purpose will be to differentiate teaching and learning in order to:

Figure 1

- use digital heritage as a multimodal (i.e. consisting of texts, photos, sounds, animation and music etc.) semiotic source in teaching with ICT.
- utilize websites, portals and various databases, including those of the Ministry of Culture (www.culture.gr), the Foundation of the Hellenic World (www.hellenichistory.gr), the Greek Radio and Television (www.ert-archives.gr) or MICHAEL (www.michael-culture.org) as digital resources for the elaboration of students’ cooperative interdisciplinary projects in the form of WebQuests (http://webquest.org/index.php), Web Albums, MS Power Point or entries about cultural heritage in Wiki type websites, like the free encyclopaedias Wikipedia or Livepedia. Students work in teams, taking roles, and use digital resources to produce their own material.
- work with social networking in the context of Web 2.0, focusing on cultural heritage, increasing the care for it, and developing critical thinking about its management. The creation of cultural blogs, the use of social bookmarking, like del.ici.ous, and the construction and participation in online communities of practice and learning by the students themselves will broaden their horizons beyond the narrow confines of the school class, make the debate on digital heritage worldwide, strength the creation of authentic learning environments and encourage open teaching.

Teaching with digital heritage could be based on using cultural objects and monuments, sites and landscapes as tools for the contextual interpretation of the world and for the perception of the heritage management as an issue of particular care and meaning (Fig. 2).

Figure 2

The suggested didactic process below consists of seven stages (Fig. 3), following the learning principles of multiliteracies and design theory. Teaching and learning are about designs of meaning. The available designs, i.e. the various existing resources, are transformed through new designing, i.e. the work performed on/with available designs in the semiotic process, into “The Redesigned Resources”, i.e. new resources ready for use as new available designs (Cope and Kalantzis 2000).
3. Examples - Scenarios
In all the following examples - scenarios, some of the technologies that could be used are:
- A video-projector
- A PC
- Internet
- Blogs
- MS Word
- MS Power Point
- The Google Picasa Web Album
- Other Web 2.0 technologies, like social bookmarking, Google docs, Slideshare, Videoshare etc.

Only parts of these scenarios have been tested under real school conditions, due to the fact that teaching with ICT in Greek secondary education faces, still, a lot of problems and, especially, those concerning the use of the school time, the content of the analytical educational programmes and the frequently changing curricula. Above all, though, teaching with ICT in Greek education is not, yet, a deliberate everyday practice and a lot must be done to this direction.

3.1. “Make your own digital museum”: a scenario about cultural heritage management using digital resources
In the course's blog, the following issues are stated: What is a museum? What is the role of museums? What does cultural heritage preservation and management mean? Can you make your own museum? The questions are designed, generally, to raise issues, rather than to provide definitive answers.

The students' task will be to construct a digital museum in the form of a Web Album, a Power Point presentation, a YouTube video etc., depending on their familiarity with ICT, using digital heritage resources. They will work in groups of three. One will be a museologist, the other an archaeologist and the third a user-visitor of the digital museum. The archaeologist and the museologist of each group will choose, in cooperation, objects or monuments and sites for the museum, using digital resources or collections and archives, like:

a. the interactive culture map, the photographic archive or the catalogues of museums, monuments and archaeological sites in the server of the Hellenic Ministry of Culture (www.culture.gr)
b. the Multilingual Inventory of Cultural Heritage in Europe (MICHAEL, www.michael-culture.org)
c. the audio-visual archive of Greek Radio Television (www.ert-archives.gr)
d. specific museum websites, like those of the Benaki Museum (www.benaki.gr) or the Museum of Cycladic Art (www.cycladic.gr)

The museum could, also, be global; therefore, the students could find and use resources from other international servers, portals or archives, like, for example, the website of the British Museum (www.britishmuseum.org). The students, during their selection, record in the course’s blog their resources using social bookmarking, like, for instance, del.ici.ous. They, also, record their criteria and other observations about the objects, monuments and sites they chose, so that everyone, in any of the students’ group or, even, outside the class, could have access to them. The users-visitor will judge the effectiveness of the constructed digital museum, and they will write down in the course’s blog their impressions and suggestions about it.

After the final presentation of their museum, students could try to discuss the initial questions of the course’s blog. At this particular point, the use of ICT enables easy access to the opinion of experts, a museologist or an archaeologist, who could be reached by e-mail or be invited to participate in the course’s blog discussion, or in a relevant to the subject teleconference.

In an alternative scenario for more advanced users of ICT, students could construct an album of an archaeological site near their school or their wider area, based, for example, on GoogleEarth. They could, also, use “Virtual Walkabouts”, an application of the Archaeology Data Service (ADS) “which includes a generator tool which can be used to generate walkabouts from any archaeological site, provided the images are arranged, processed and indexed as appropriate” (http://ads.ahds.ac.uk/catalogue/specColl/walkabout/index.cfm)

3.2. The Greek Neolithic in Wikipedia
In this scenario, the students’ task is to check the existing entries as well as to fill in any blanks by editing new entries concerning the Neolithic period in the Greek Wikipedia. They work always in groups, and they also have certain roles researching specific aspects of Neolithic civilization according to their preferences, i.e. the pottery, the architecture, the economy, the ideology or the Greek Neolithic sites in general. Their sources could be the servers, portals and digital archives mentioned in the preceding scenario, together with sites like the approved, by the Greek Pedagogic Institute, “Hellenic History on the Internet” (www.hellenichistory.gr) which has been produced by the Foundation of the Hellenic World. A possible elaboration of the above scenario would be the production of a school “Archaeopedia”, an open, accessible by all, (teachers, students, and the public in general) wiki type application, accompanied by a forum where all users could contribute, distribute and discuss their data.

This will be a great opportunity for students to review, at a more advanced level perhaps, the way in which knowledge is produced and distributed in the new Web 2.0 social electronic environment. They can think about the issue of image and entry authenticity and become familiar with the principles of widespread adoption of digital surrogates like empirical provenance (Mudge, Ashley and Schroer 2007), while they communicate and distribute their knowledge.
3.3. The digital surrogates as tools for the understanding of our contextual world
Archaeologists use archaeological finds as indicators of both the tangible and the intangible world of past societies. The digital surrogates of archaeological finds could be used in the same way. The students will work with the surrogates of ancient objects like archaeologists. Their task will be to determine the use of these objects and the social context wherein they were framed. All kinds of digitized portable antiquities of all periods, figurines and statues, pots and black-or red figured vases, stone and bone tools, ornaments etc. are appropriate for raising issues about their use in social context. The students' final product could be a blog, a Web Album, a PowerPoint, or a video presenting the social "biography" of a material object, through the ages, from the present back to its first appearance. This approach is, in fact, experiential, since the web quest needed for the identification of ancient objects by students will start from the modern world and the modern usages of such objects.

The role of digital heritage archives and collections for the accomplishment of the above goals is crucial. Students will not only be in close contact with surrogates of tangible archaeological remains, but they could, also, think and discuss issues of the intangible heritage. They will understand the social importance of a series of daily activities, like, for example, clothing, eating and drinking, producing music or listening to it, feasting, or taking part in different rituals. They will, finally, realize the cultural heritage's significance, either in its digital or in its authentic form, in order to understand the past and the present as well.

4. Conclusion
The key role of digital heritage in teaching with ICT technologies, using a digital heritage didactic, leads to the development of high-level cognitive skills, like problem solving, tackling one issue from different angles, or producing a new digital resource by students themselves. It entails communication and collaboration during the teaching. It creates, finally, an environment of critical learning and thinking wherein the student could express his/her identity and individuality. Above all, however, a new window to the world is opened; a new kind of communication among young people and between them and culture experts is established concerning cultural heritage and its management. The digitized heritage can bring the so far absent cultural heritage into school life.

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