

**“Climate Change and its Impact on Archaeological Sites” – Building Awareness
in a Virtual Creative Classroom**

Maria Kokolaki

School of Anthropology and Conservation, University of Kent at Canterbury -

Maria Dogkogianni

Agioi Theodoroi Junior High School, Agioi Theodoroi, Greece

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Abstract

Nowadays there is much interest in embedding environmental issues to primary and secondary Greek education, which is mainly focused on protecting natural environment and local sites. The purpose of this article is to articulate another type of discourse orientated to the effect climate change bears on archaeological monuments by linking ecological conscience to the protection of cultural heritage through education. Accordingly we present an educational proposal which is inspired by the work of IHC (“Initiative for Heritage Conservancy”) and represents the need for instantiating cultural values through education in tangible outcomes related to the preservation of both the natural and cultural heritage. It is a project for Ancient Greek History class and involves the monuments of the classical era the conservation of which is on the focus of scientific interest. The educational environment is a wiki, for putting emphasis on social constructivist pedagogy and for being flexible, reflexive and participatory.

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Introduction

This paper presents a project that took place at a Greek secondary school about the impact of climate change on natural and cultural heritage. It is an educational proposal connected with the effort to build ecological conscience and sensitivity through education in Greece. Although environmental education in Greece is not yet an independent subject in the formal secondary school curriculum, it is linked to several non-formal types of school educational activities.

Conversely, since the protection of natural and cultural heritage is a value found in the analytical curricula of many subjects, educators have the option to build environmental projects on an interdisciplinary basis. Within this framework, we piloted an action on an interdisciplinary basis, covering History, Archaeology, Environmental education and Restoration of monuments.

Our principal aim was to portray archaeological sites, and specifically important ancient Greek monuments which are culturally familiar to Greek students, as important cultural heritage which is endangered and should be protected.

Using new technologies in the classroom we attempted to connect the socio-cultural experiences of students to their surrounding world and drive them to shape values and positive attitudes towards contemporary issues such as climate change and the preservation of cultural landscapes.

Students had to complete various tasks using a wide range of cognitive tools. So, they used the Web 2.0 environment in order to interact, systematize their work and provide feedback. Students also searched the internet, played on-line knowledge games, learned how to interview and compose multimedia/multimodal texts via synchronous and asynchronous communication.

Accordingly, metacognition was achieved through feedback and reflexivity, as the wiki allows students to produce and assess experience and knowledge, while also to embed this knowledge and experience into actual communicative instances.

Finally, this educational proposal was inspired by the environmental action of I.H.C. (“Initiative for Heritage Conservancy”)¹ and negotiates the need for instantiating cultural values through education in tangible outcomes related to the preservation of both the natural and cultural heritage.

I. Theoretical concepts

The word heritage covers everything passed on to us from the past and originates either from nature or from culture (Lowenthal, 2005). “Heritage is our legacy from the past, what we live with today, and what we pass on to future generations. Our cultural and natural heritage are both irreplaceable sources of life and inspiration” (Unesco: <http://whc.unesco.org/en/about>).

¹ The Websites of the initiative are: <http://www.inherity.org>, <http://www.climateandmonuments.com> & <https://sites.google.com/site/climatechangeandmonumentsihc>

So, elements of nature like ecosystems would build our natural heritage, while the world created by human intervention would be our cultural heritage. However ambiguous or arbitrary may this distinction be, nature and culture are “at the heart of studies of place and landscape” (Tilley, 2006: 19).

‘Heritage’ further may signify the need of people to maintain stability and bonds with their past versus change and the perceived instability and fragmentation which modernity supposedly brings (Tilley, 2006). Despite the term employed for the protection of heritage, be it preservation or conservation or safeguard, all these signify the ambivalent disposition of the modern man towards change and its impact on environment. As Cosgrove (2006: 57) maintains “each of these terms parses slightly differently a similar goal of arresting or at least negotiating the social and environmental impacts of change with the intention of sustaining values inherited from the past”.

Moreover, natural and cultural heritage are both crucial for building our collective and personal identities. In this sense conservation of natural heritage and preservation of cultural heritage such as archaeological sites are equally important, especially for the modern man who experiences environmental change and feels threatened by the loss and alteration of natural and cultural landscapes.

Since, knowledge of environmental issues covers the consequences of human intervention, developing environmental sensitivity and positive attitudes towards natural and cultural environment lie usually in the core of environmental and cultural educational programmes.

This project builds on the tripartite conception of environmental literacy (Stables 1998) as functional, cultural and critical, and promotes the idea of the school being an integral part of the community and an eco-cultural space-time.

Regarding environmental education as a kind of literacy according to Stables (1998, 2003) lies to the fact that “environment is moulded by human hands, is susceptible to action predetermined by human value systems and cultural norms and is, therefore, appropriately studied using approaches derived from the arts and humanities as well as from the sciences” (Stables, 1998: 156)

In the aforementioned perspective, functional environmental literacy aims at a multiple understanding of environment around us, focusing on natural landscapes, ecosystems and local environmental issues, while cultural environmental literacy takes into account the interaction of cultural and social forces with the environment and, therefore, focuses on eliciting sociocultural values attributed to the environment. Finally, critical environmental literacy is about achieving such deep environmental awareness that would develop into an engagement and creative action for environmental issues (Stables, 1998; Bishop et al, 2010).

Further, taking into account that modern reality is characterized and largely shaped by the extensive use of new technologies and of the new media which enhances the paradox of increasing globalisation while also increasing local diversity (Cazden et al., 1996), social constructivist pedagogy and multiliteracies (Cope & Kalantzis, 2009) would provide a pedagogical framework for considering and applying multiplicity of representations (print, digital and visual).

The project uses online learning communities (Wiki) in the framework of a social constructivist pedagogy which encourages students to set and achieve objectives, to take initiatives and to gradually construct knowledge in a collaborative and pleasant environment. The nature of web-based learning communities not only promotes interaction and collaboration, but also introduces a new sense of time and space in the cognitive processes, broadening situatedness and synchronicity.

From the social constructivist perspective this occurs in social interaction, which is promoted by Web 2.0 collaborative environments (Wang, 2009; Rosen & Nelson, 2008). Wikis, in particular, students of the learning community to communicate, read and write, produce multimodal texts, make statements and receive observations, while also to think over in the discussion or comment sections. At the same time the discussion and comment sections enable the teachers to interact with their students and give feedback, while also the 'history' tool allows teachers to watch, follow up and assess the progress of the students (Rosen & Nelson, 2008).

Online learning communities are based on the rationale of a pedagogical exploitation of student networking. In this way they promote collaborative learning and student-participatory learning environments (Rosen & Nelson, 2008), while they also enable constructivist pedagogy, reflexivity and playful learning.

Cognitive and social constructivist orientated pedagogies are characterised by a variety of parameters based mainly on the recognition of the social nature of learning and the gradual construction of knowledge. Students' active participation is encouraged, in an environment which allows the creation of authentic learning situations, elicitation of prior knowledge, cognitive dissonance and reflexivity. Finally, the aim is for the student to be able to construct and apply new knowledge creatively (Harness & Drossman, 2011).

Moreover, Rosen and Nelson (2008: 220) introduce the term Education 2.0 in order to describe a participatory creative and interactive type of teaching and learning using online environments as "the use of digital tools to transform teaching and learning by having learners, as well as teachers, participate in knowledge creation and interactively build distributed communities, or networks, of learning".

II. The design of the project

We base the proposed project on the hypothesis that heritage in the natural and cultural sense is an ambiguous conception as it relates to the changing values and experiences of human beings and societies. In the modern times this change happens under the transformational shift of modernity and globalization. In this sense cultural heritage and, in particular, archaeological sites could be assessed as a value based on shared knowledge which is adapting and entangled in landscape transformation not only in the past but in the present circumstances as well.

Accordingly, we applied an interdisciplinary approach in the History class of first grade Junior High using new technologies. We selected the chapter about art in the classical era, which covers art and the greatest monuments of which the restoration has been the focus on scientific debates. We chose as our case-studies the Temple of Epicurius Apollo at Bassae and Parthenon and Erechtheion of the Acropolis at Athens that are recognized as world cultural heritage by UNESCO. Their conservation is of

great importance and the various issues of erosion that they face have triggered scientific interest and called for a variety of restoration techniques.

Furthermore, our involvement with the activities of the I.H.C. (“Initiative for Heritage Conservancy”) and the idea of creating a transferable exhibition for the impact of climate change on ancient monuments motivated us to transfer our experience in the educational process in the school and give students the opportunity to prepare, be part of and participate in a transferable exhibition open to the local community. So, this process involves broadening of the educational process and allows opening the school community to society.

Our principal aim was to portray archaeological sites, and specifically ancient Greek monuments, as important cultural heritage - being a point of reference for building identity in a modern world which is constantly changing. Climate change in particular causes ongoing alterations to both natural and archaeological sites. However, natural forces as instantiated in the threat of climate change, is only one aspect of the threat for the monuments. The other threat stems from the changing values of the modern man and the gradual detachment from the natural environment.

In particular the project aimed at:

- inviting students to carry out a study of the most important sites of classical era in Ancient Greece and of the problems for their restoration and preservation
- inviting students to carry out a study of historical climate change, by conducting search in the internet sources allowing them to construct a general view on climate change
- conducting research on the possible effects of climate change on the environment, cultural and natural landscapes
- giving students the opportunity to actually and virtually visit monuments
- bringing them into touch with local sources and international organizations for the protection of the monuments
- allowing students to understand the effects of climate change on cultural heritage
- giving them the opportunity to appreciate the value of cultural heritage and the need for its preservation
- allowing students to work in groups and construct experiential knowledge
- allowing them to interact and communicate their knowledge
- inciting them to organize and participate in local events
- take action for the preservation of cultural heritage

Further we aimed at embedding/transferring this knowledge and experience into actual communicative instances which was enhanced by the use of the Web 2.0

environment. The Wiki used in this project enhanced collaborative learning and created authentic communication, both synchronous and asynchronous, since it allowed students to work in groups and also self-reflect, share messages with one another and come in touch with formal institutions for the protection of cultural heritage. The use of blended learning incited students to work together and take initiatives, while it also helped the teacher and the students to trespass the time and space limits of the school formal curriculum.

Metacognition was attributed through commenting, reflection and evaluation provided by the Wiki's tools and offered the participating students the ability to develop skills for producing, assessing and utilizing prior and new experience and knowledge. As part of the feedback provided to and by learners, the IHC assisted by participating both in the virtual learning community and in the setting up of an exhibition for the project called "Climate Change and the Monuments", which will be open to the local community. We also programmed visits to the aforementioned monuments as a part of an experiential approach.

In parallel, the students could virtually access the archaeological sites, learn about the corrosion of various monuments by different factors, including climate change and human factor, and watch the attempts for their restoration. The process included also web search with the simultaneous evaluation of internet sources. This brought children in touch with comparative analysis and enhanced their critical thinking.

Finally the use of general software as Word and Powerpoint, gave the students the opportunity of creating texts in a creative and playful way, since they were able employ and combine various narrative tools such as pictures and sounds in order to create multimodal and flexible texts and produce their own reflection on and interpretation of the modern world and actual problems. It further brought the children in touch with various types of expression in the framework of creative writing and theatrical play. We also created an online learning community, in the form of a Wiki named «ecomonuments», at <http://ecomonuments.pbworks.com>.

Specifically, the class worked in groups, each on a distinct thematic unit: the first one named "Archaeologists first team" on Parthenon, the second ("Archaeologists second team") on Erechtheion and Epicurius Apollo temple, the third ("Environmental team") with climate change and the impact on monuments and the fourth one ("Restoration team") on restoration of monuments.

The first group had to locate and collect visual and written sources related to Acropolis searching the internet which was loaded on its page on the wiki. Then they focused on Parthenon and its frieze and played the online games from the Museum of Acropolis. Finally, they worked on their worksheets on the Wiki.

The second group had to locate and collect visual and written sources on Erechtheion, the Caryatides and the temple of Apollo at Bassae. They played the online games from the Acropolis Museum and finally they finished their worksheets.

The third group had to locate and collect visual and written sources for the types of environmental pollution, especially those that provoke corrosion of the archaeological monuments, by focusing on the specific problems that Parthenon, Erechtheion and the temple of Apollo face.

The fourth group had to research on the restoration of monuments. This team had also to interview one restoration specialist. The interview was posted on the wiki, taking the form of a questionnaire which was replied and commented by a restoration specialist of the IHC. Finally, the team focused on the selected methods of restoration of the particular monuments.

The final phase of the project was inspired by the particular method used for the protection of Apollo's temple at Bassae and involved the use of general purpose software for the production of multimodal multilevel texts. So, the two first teams had to write a story on the adventures of a column from the temple of Apollo, from the day the temple was created to the present day when it is "trapped" in a tent for its protection from the weather and natural phenomena. Students could utilize the myth of Phaethon, which on one hand is related to Apollo as the Sun-God and on the other to human choice and action as a cause of natural catastrophes. The third team had to make drawings or collage in order to represent scenes of the story, while the last one had to make a movie out of this material using Moviemaker.

All the work was posted on the wiki. It was also presented in the school assembly at the end of the school year and it will be included in the planned exhibition for the climate change and the monuments which will be organized in collaboration with the IHC for the local community.

The procedure helped students to realize the value of important monuments of the classical era and to assess them as monuments of world heritage. They found out various risk factors for the monuments and in particular climate change and learned about the possible methods of their conservation and restoration.

In this way History class was turned into an experiential trip in the world of archaeology, while at the same time this encouraged reflection on climate change and its impact on the monuments and would result in the raising of environmental awareness. Apparently, the project we outlined helped us raise students' awareness for the impact of climate change on the monuments, while also it instigated them to shape values and positive attitudes and take action for the protection of their cultural heritage.

III. Final Outcomes and Suggestions: revaluing heritage

In the framework of a socio-constructivist approach, this school project aims at articulating through education an alternative type of environmental discourse which would put emphasis on the effect climate change bears on archaeological monuments and relate ecological conscience with the protection of cultural heritage.

Historical knowledge is envisaged in an interdisciplinary way, in combination with ecology, environmental knowledge and new technologies, in order to give the children motivation for improvising and taking initiatives.

So, this action is based on the principle of considering the student as the main actor in the educational process. Giving active roles to students and instigating them to work together or share views and experiences with others means engaging them in the process, which is essential for enhancing critical environmental literacy.

The use of the online learning community as an educational medium introduces a communicational framework for team work and blended learning which helps students capturing the interdependence of humans and culture with nature and identifying not only the degree of human responsibility but also the potentials of human intervention. Additionally, the employment of general purpose software and the internet sources broadens and supports skills for research and assessment.

School-based formal learning further interweaves with forms of non-typical and atypical learning, in order to instigate the participation of students in local and other initiatives for the protection of natural and cultural heritage. So, this form of constructing knowledge enhances both students' and the community's awareness and represents the need for instantiating cultural values through education in tangible outcomes related to the preservation of both the natural and cultural heritage.

Understanding the impact of historical climate change on archaeological sites is in part related to the value attributed to those sites, which historically changes over the years. Value assigned to heritage sites represents a two-way link between people and those sites and is instantiated in their diachronic use by people. As Carter and Grimwade (1996: 46) observe, "heritage implies ownership and value to particular groups of humanity".

So, building values and identities through creative learning and the use of new technologies could be a way of motivating interest and building awareness about cultural and environmental issues in a more influential and meaningful way at the level of secondary education.

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