

m-LEARNING TECHNOLOGY APPLIED TO HERITAGE AND ARCHAEOLOGICAL LEARNING

Alex Ibáñez Etxeberria (*)

José Miguel Correa Gorospe (*)

Mikel Asensio Brouard (**)

(*) *Berril@b, Innovative Education and New Technologies Laboratory, Universidad del País Vasco.
Oñati Plaza 3, 20018 - San Sebastián, Spain*

(**) *Laboratorio de Interpretación del Patrimonio, Universidad Autónoma de Madrid
Pavlov 6, 28049 - Madrid, Spain*

ABSTRACT

In this article we present the most important characteristics of an educational program based on m-learning technology for developing heritage and archeological learning in the 'Menosca Territory'. We have structured the article into three parts: Firstly, we review the concept of museum territory and the educational implications of the cultural and natural environment (material and untouchable heritage). Secondly, we realize a discussion about the theoretical principles on museum learning; and thirdly, we explain Lurquest technology, on which our learning program has been created, and we explain the main dimensions of Lurquest program. We have also included several conclusions from the project's pilot study.

KEYWORDS

m-learning, learning heritage, learning archeology, webquest, lurquest

1. "MENOSCA TERRITORY": A WIDER CONCEPT OF HERITAGE AS A CONTEXT FOR LEARNING AND RESEARCH

The integration of digital technology in museums and heritage exhibitions can help to produce changes in cultural and educational uses in these contexts. M-learning technology used on mobile devices is one of the technologies most widespread and used throughout society (Winters, 2006). We choose the M-learning technology because we think it has excellent potential to be used in the museum and heritage context.

We defined "*Menosca Territoyr*" as a physical (geographical), of knowledge (historical - cultural and psychological) and community (anthropological and social) context, where we are going to situate the learning experience. This is important element for two reasons: firstly, because the cultural and natural environments become in museums contents and messages (Tilley et al., 2006); and secondly, because we situated the learning are in the heritage and archeological spaces. The Menosca context is the content to be studied and the physical space where the knowledge is constructed, and where the activities and research tasks are developed and applied. The Menosca territory is an interdisciplinary and an interactivity concept, where the final constructions depend form the relationships among end-users.

As a leisure time space, the Territory Museum serves to articulate under a common conceptual framework, the different themes and resources present throughout the referenced territories (Padró, 2002). The Territory Museum would be a type of open museum in which the objects and exhibits are presented in their social context and in their original physical environment, interacting with the inhabitants of the territory, and where all of these agents are protagonists. This idea of a new museum represents the addition of territory + patrimony + community, versus the more traditional concept of building + collections + public (Iniesta, 1994).

In our specific space, Menosca refers to one of the enigmatic enclaves that classic geographers describe as part of present Basque Country territory. This denomination has been used to bring together the physical

area under a singular denomination, known as Menosca Territory (Ibáñez Etxeberria, 2003). From a heritage perspective, it is noteworthy in this area the significant quantity of resources related to archeology, among which can be highlighted the Church of Santa María la Real of Zarautz (Ibáñez & Aranburu, 2005).

Obviously, this open wider heritage concept need a new approach, in a more interpretative way (Hens & Blockley 2006), with more open a wider tools for communication and learning. M-learning technologies could adapt more than traditional descriptive tools to the requirements form a complex-territorial and community-interactive heritage.

2. INFORMAL LEARNING ON MUSEUMS AND HERITAGE

The current framework of the Museum Learning is the informal learning from a constructivism perspective (Hein, 2006). Informal learning is a learning paradigm wider than traditional formal learning which includes open air and free choice activities as well as structured current activities from curriculum (Bekerman, Burbules & Silberman-Keller, 2006; Cross, 2006; Hager & Hallidey, 2006). Thereby, informal learning is an excellent conceptual platform to reach new technologies (in the same way, different physical spaces than traditional sources like classroom or textbooks), with similar free choice setting. Informal learning process includes all different kinds of competences: motivational, procedural, conceptual, attitudinal and interactive/collaborative (Asensio y Pol, 2002).

Falk and Dierking (2000) consider that all learning is situated in a series of contexts, and that to learn is not an abstract experience that can be isolated in a laboratory, but rather it is an integrated experience that occurs in the real world. Of course, this perspective is devoted to a situated learning paradigm, focusing into the general cognitive perspective. Therefore, all learning is accumulative, a long life term, non-linear process which looks to make sense of received information and to make connections within such. The level of knowledge on a specific topic is a culmination of knowledge constructed from a variety of informational sources, such as school, newspapers, family, television programs, movies, observations in the world and of course museums as well. It is the work of the school and of museums to construct knowledge connections around the heritage.

Because learning continues throughout life, the informal learning and the free choice setting takes on a special importance in human development. In this concept of informal learning, the process tends not to be linear. It reflects personal motivations and incorporates self conducting and interactive participation in the learning processes (Ibáñez Etxeberria, 2007). This perspective translate to the museum atmosphere the need to program open activities that allow personal or groups visitor experience to develop their own potential in the manner which their chooses.

Regarding archaeological or historical sites, the integration of ICTs in educational processes allows museums to contemplate physical, personal and virtual environments in a complementary and reinforcing way. In addition, it serves as an attractive alternative for informal learning about heritage which results in this learning being a more enjoyable activity (Asensio & Pol, 2002) and, at the same time, meets the long-life educational standards throughout visitors' lives.

Therefore we believe that the presence of a museum in a network and that integrates new technologies into its educational programs, should offer a coherent design with a learning model based on research and active construction of scientific knowledge. In our case, we have validated m-learning technology with learning based on mobile computing devices. In contrast to other more static technologies, m-learning permits users not only work on an individual or cooperative basis but also allows for the possibility to work inside or outside of closed spaces, such as schools and museums, thereby allowing users to access monuments and the natural environment.

3. LURQUEST: PLANNING, METHOD AND DEVELOPMENT PROGRAM

We prepared three programs oriented to study the process of Basque Coast's Romanization, contemporary art and its public presence, as well as the territory's orientation and learning with mobile technology.

We selected a variant of the webquest model, 'lur-quest' (wherein "lur" refers to the territory). Webquest is an educational activity, edited on the web, and oriented to be used with Internet-based resources and to

follow structured steps with a teacher. The lurquest model is a webquest derivation which uses mobile technology (Correa & Ibáñez, 2005, Ibáñez et al., 2005, Botenttuit, Coutinho & Sternaldt, 2006). It is a strategic learning and research tool for multiple situations and it is very convenient for PDAs or mobile telephones. This capacity is possible by the connection possibilities (inherent in mobile technology) and the integrated services from the personal computing devices. The tool provides to explore the territory and orient oneself helping by GPS technology. Also, the tool allows that several research activities were used (using WiFi connections). Of course, the platform could work with different documents (photos, recordings, reports). Lurquest follow a learning perspective based on nomadic inquiry (Hsi, 2003), in which are combined multimedia technology's potential for creating knowledge, the Internet and webquest in the search for information, creation, dialogue reflection and production, and the active development of learning roles in work and field trips with mobile educational support.

The three lurquest were developed on a Moodle platform (Open Source software) combining the use of personal agendas (PDA HP IPAQ Pocket PC 3715) with GPS technology (Garmin eTrex).

The designed *didactic itineraries* (educational paths), are structured in three related phases:

- a) Before the visit, into the school center, students begin to work with lurquest. This methodology uses the Internet and several software programs relating previous knowledge with the subject to be studied.
- b) The heritage visit, a educational path around the territory, supported by their mobile technology and where they develop different activities which require them to observe, gather data and investigate thereby forming relationships and looking for solutions with the objective of improving their knowledge of the territory.
- c) After the visit, once again into the school center, students are required to edit and organize the information gathered in order to complete their research projects. This culminates in their making classroom presentations to their classmates, and publishing their findings on the web thereby using the Internet as a means to disseminate their learning.

Three different itineraries were designed:

- 1) "Menosca Expedition". It is the most simple, with a procedural goal, where students learn and practice with the basic technology (PDA and GPS).
- 2) "Searching Menosca: archaeology and Basque Country Romanization". It is a role playing game where students leave to the nearby territory, visiting archaeological sites and historical roads.
- 3) "Sculptures: from street signs to the museum object". It is a second role playing game where students have to organize a tourist guide and design a sculpture.

The pilot study was developed in 2005. The sample was composed by three teachers and 52 students form the 4° level of secondary school Lizardi Secondary School of Zaratz), selected from the list of frequent visitors to the heritage city. We used different evaluation tasks with different moments of administration. 'Participant observation' was used during the experience and itineraries. A 'self-efficacy scale' and a 'competence model of information utilization' were applied before and after the experience. Finally, a 'satisfaction scale' was applied after the experience (Ibáñez, Correa y Jiménez de Aberasturi, 2006).

Results were described and analyzed following four different dimensions: educational organization, the use of digital technologies, teacher's opinions, and student's opinions and competences (Ibáñez, 2007). Scholars' products were held on the web.

4. SEVERAL PROVISIONAL CONCLUSIONS ABOUT THE PILOT PROGRAM STUDY

1. The Territory Museum as a conceptual tool, not only a physical space, nor an intellectual construct and an artificial metaphor. It is a socio-cultural construct, limited geographically, but it is converted into a space for cultural creativity development and permanent learning. The Territory Museum strengthens the use of all of our learning channels using multiple intelligences.

2. Evaluation program data gathered during this project confirms the success of the project's orientation. Lurquest is confirmed as an attractive and valid tool for gaining significant knowledge of the environment, through an immersion path into the natural and cultural heritage as well as a structured exercise within the school curriculum.

3. About using technology, data indicates that students were quite able to learn to use the mobile devices. These are considered as being much more interesting for learning and thereby achieve the function of being a “hook” as presented by Csikszentmihalyi y Hermanson (1995).

4. The analysis of students’ participation indicates that they were highly able to work with the information and noted strong satisfaction with the activity. However, a certain degree of dissatisfaction by some students was noted as regards the different itineraries and their specific complexity and difficulty. A significant part of students show an important attitudinal change about the importance of heritage and archaeological study in order to gain a better understanding of our environment.

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