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IMPROVING HISTORY LEARNING THROUGH CULTURAL HERITAGE, LOCAL HISTORY AND TECHNOLOGY

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ABSTRACT

History learning is many times considered dull and demotivating by young students. Probably this is due because the learning process is disconnected from these students' reality and experience. One possible way to overcome this state of matters is to use technology like mobile devices with georeferencing software and local history and heritage sources in a collaborative experimental approach to learning historical concepts of the traditional curriculum. This paper describes a study that has been done with a classroom of 7th graders in the scope of the History discipline and that combines the mentioned ingredients to foster history learning and interest.

KEYWORDS

History learning, Local heritage, discovery learning, collaborative learning, smartphones, GPS.

1. INTRODUCTION

The study of Heritage in local context values History as a learning living source, facilitates the understanding of historical concepts and helps to understand the world in which we live, contributing to the multiple understanding of history and to the building of the three pillars of history education: History - Memory - Identity.

Cultural assets and heritage are therefore pedagogically important as they are significant consolidation and implementation learning means that make teaching less bookish and more alive, giving meaning to learning too (Mendes, 2009).

Studying heritage and local and/or regional history is central to history learning and to the introduction to students to the discipline methodology and specific language – it is motivating, increasing the interest in history learning, integrator, because it contributes to the placement of the students in the environment they live in, and, in that sense, reinforces aspects of identity building, and it facilitates the understanding of history as a dynamic process in which knowledge appears not as being imposed, but making sense in a network of connections that are established between information, sources, testimonials and a narrative.

On the other side of the question, combining history teaching with technological tools and multimedia runs into the motivation of the majority of the "digital-born" for whom the screen is the most natural way to learn, communicate, play and interact (Moura, 2008, p. 142), taking advantage of students' potential and approaching the school and the teaching practice to the daily practice of this generation, familiar with the Internet and the constantly updating of technology. Simultaneously, it is a way to provide the same opportunities to all students and fight the digital divide.

"It is the quality of teacher education programs that is the key issue to a successful integration of ICT into the classroom and depends on the ability of teachers to structure the learning environment in non-traditional ways, to merge new technology with new pedagogy, to develop socially active classrooms, encouraging cooperative interaction, collaborative learning, and group work". (UNESCO, 2010).

The main aim of this work was to develop a way that prioritizes research methods, discovery learning and problem solving, motivating students to the understanding of the local environment and valuing them as active learners, showing also the possibilities and pedagogical advantages of approaching 7th grade History contents in conjunction with Heritage and Local History and using innovative and recent tools and

technological applications in the areas of e-learning, Digital Culture and Historical and Geographical Information Systems.

2. MOBILE DEVICES AND GEOREFERENCED APPROACHES IN EDUCATION/HISTORY

Mobile technology is a resource with great potential to be used both in teaching and learning.

Its characteristics of mobility, portability and interactivity, ease of use, low cost, multiple and varied functions (like communication, taking pictures, recording, geographical orientation, etc.) bring great advantages (and challenges) to the process of teaching and learning: it eases experimental learning, it enhances collaborative work and makes knowledge more accessible, personalized and adapted to each one's rhythm.

Also the use of mobile technology with activities of georeferencing (Global Positioning System (GPS) and mobile phones / smartphones) has been done in education. Among the many experiences we can find, we can refer the "Projecto GO: Mobility in education", in the areas of History and of Heritage and Natural History contemplates the "development of historical, cultural and environmental pathways for Web global positioning systems" and the sharing of "information in the Internet as part of promotional activities of the local environment (in cooperation with the surrounding community) and national and international exchange projects" (CCEMS, 2008).

Also the project SchoolSenses@Internet uses geo-referenced multisensory applications developed by and for Portuguese students and teachers from the 1st cycle of education, as a strategy to improve the quality of elementary school education (Marcelino, et al, 2007). Through active practices that enable the analysis of complex dynamical systems, as well as the acquisition and sharing of knowledge, skills such as understanding, reasoning, reflection and creativity are developed with very positive results on the cognitive development of children.

These and similar applications enable interaction and the introduction of multimedia content, along with georeferencing, and that became pedagogical tools with unquestionable advantages: they allow the accomplishment of tasks through physical actions in the local environment, they encourage a greater participation and reflection ("enable children to reflect on what They are Currently engaged in", Druin, 2009) and they favor the development of diverse, but efficient forms of management and sharing of information. The ease of use and the friendly interface stimulate students' performance, capturing their attention and developing their autonomy, as they can be used in the construction of new knowledge, in the perspective of a collaborative and interactive learning.

Some other experiences of m-leaning corroborate the mentioned potential, namely:

- A greater collaboration among peers;
- Better results were achieved, but above all, the quality of learning was considered better: the learning process was more attractive, students felt more motivated and active participants in the construction of learning;
- Also the sense of belonging and identification were increased by the participation in "*virtual communities*" that overcomes age and cultural barriers" (Moura, 2008)

In conclusion, with Druin – "bridges can be built with mobile technologies that transcend differences in age, race, religion, nationality and culture which are worth significant investment" (Druin, 2009, p. 331).

3. THE PROJECT

The project consisted of developing a historical georeferenced route, called the Castle Route, working collaboratively with a first group of students in the class, completing the route with the whole class after and later editing and displaying it on Google Earth (GE), in a knowledge consolidation phase.

"The representations and interfaces for geographic information are seen as tools to make it possible: the link between real experiences and virtual experiences; travel between macro and micro worlds, between global and local contexts, understanding and sharing of experiences and environments and local identity" (Gomes, Silva, & Marcelino, 2005, p. 1).

3.1 Project Objectives

The main project objectives were:

- To foster interest in historical and cultural heritage, leading students to reflect, investigate, disseminate and share it.
- To acquire some skills through motivating and meaningful learning in local context.
- To encourage teamwork spirit in multidisciplinary groups.
- To develop a collaborative and research work of curriculum content associated with the use of Web 2.0 tools, including Google Earth and smartphones.
- To share information on the Internet as a way to promote the local environment, in conjunction with the school and the Local Authority.

Achieving these goals was based on methodological principles of active and constructivist pedagogies, namely:

- Discovery and problem solving learning;
- Learning in local context and through direct contact with the sources and the handling of materials;
- Learning through Information and Communications Technology (ICT).

3.2 Method

A pilot group was formed that drafted the historical and documentation research necessary for the development of the georeferenced historical route.

It was outlined a 1st work plan with a schedule of workshops according to the availability of the group. Relevant information was made available via Moodle, in a discipline created for this purpose - Local History and Heritage (HPL). Online work was preferable, especially with respect to the preparation of texts to integrate in the route “placemarks”. Alongside the group was getting familiarized with the software and the technology to be used.

The remaining students of the class received the tutorials of the software applications to be used and were aware of the issues under study.

3.3 Technology

The field activity - georeferenced historical route - besides other multimedia tools, was based in the use of technological resources such as smartphones, Google Earth and the Active Track software.

Windows Mobile, of Microsoft Corp™, Apple iPhone™ and Google Android ™ transformed the mobile phone concept, which has become a small personal computer – a Personal Digital Assistant (PDA) and a Smartphone (the latter with an open operating system allows users to, apart from all other functions, integrate personal software). Realizing this asset for Education, the Centro de Competência TIC «Entre Mar E Serra» (CCEMS), in partnership with the Portuguese Ministry of Education, developed a software to create georeferenced active routes to be used on smartphones with the Android system – the Active Track software, which can be downloaded on smartphones and after edit the routes created in GE (CCEMS, 2008).

The Active Track software is easy to use and has clear and complete tutorials. A route is made by points (the number depends on the type of route, but there is no limit). When one creates a point the program allows the inclusion of text (according to the information that is relevant) in four models - text only, text with an image, text interspersed with pictures and text with a form. It also allows the integration of multimedia content (photos and audio - Mp3 or other audio files and YouTube videos) and links to Internet sites.

Point of interest coordinates to visit can be imported from GE (the software has an option for that) or can be inserted into the compass card. A Google KML file (latitude, longitude and the title of each point) can also be imported. The route data will be stored on the computer hard drive later. A route can always be reedited and it is possible to preview the point being edited.

So, for the field activity, after selecting the route on the PDA (for which it has been exported), each group had to trigger the recording (REC appeared on the screen), and from that moment on the groups had to orient

themselves in situ. The route appeared on the screen through “balloons”. Clicking in a “balloon” the point name appeared. The distance to the points was given on the left side of the screen, regarding to the point that was being followed; on the right side the distance to the nearest point could be seen. At each point there was audio information, text information and sometimes pictures. When they reached a point coordinates, the phone emitted a beep, and then appeared on the screen the information entered for that point. This information was given in audio, whenever transmitted by the mayor, see below, but the text and the images also appeared on the screen. When it was only text (which happened in four points along the way), this was always complemented by medieval music.

At any route point a photo could be taken. Each taken picture added a point to the route. In all placemarks there were tasks to be done that included this feature and also writing a text that could simply be the photo caption.

After conclusion of the route, and the recording on the smartphone, it was downloaded to the computer for posterior visioning in GE, with or without editing. The edition work is important and complementary, as it also helps the consolidation of knowledge, as it leads to activity analysis and reflection - in each placemark one can include more information (including links) or simply format the information introduced along the way, from the pictures to the text. Also new placemarks can be included. For editing the KMLBuilder software from NorthGates Systems was used. KMZ files can be hosted on any platform, Website, or computer, and to be displayed it is just needed to have GE installed.

Another strategy that can be used is to create content directly in GE - folders can be created that include the placemarks, the paths or the routes. Students can interact with diverse placemarks, enrich their work with their own findings and resources, and create hyperlinks. Using the HyperText Markup Language (HTML), video and audio can also be incorporated.

In fact, GE is a tool available to everybody, given the undoubted advantages that it exhibits:

- It is a virtual 3D globe, with a friendly interface of easy and intuitive navigation;
- It uses satellite imagery, aerial and 3D Geographic Information System (GIS);
- It is free and simple to install (Google provides a plugin or extension module that can be placed on Web pages), adaptable to various operating systems and compatible with the most common browsers;
- It allows the sharing of information and, more important, particularly with regard to its added value in an educational context, it allows the inclusion of data and contents (from text to photos and animations, 3D images, paths, guided tours, placemarks, etc.) – this way the information can grow and be diversified;
- It has great interactivity, allowing virtually travelling by streets, mountains, cities, museums and monuments, explore the Earth and the Space;
- It provides multiple layers of information and services - weather and geological phenomena, unexplored places, such as the deep of the ocean, other planets and galaxies, small places, towns, cities, rivers, mountains, roads and paths, historical places and maps and information about ancient civilizations;
- Its tutorials are accessible and easy to understand.

On the other hand, the technological advances in communications and hardware (mobile phones) allow to combine GE with mobile devices, facilitating its use outside the context of the classroom and contributing to a new educational “paradigm” or a new form of learning - mobile learning or m-learning - that “enable children to reflect on what they are currently engaged in” (Druin, 2009, p.5) and that enhances the collaborative work (in pairs or small groups, or even with the entire class, with or without the teacher).

3.4 The Castle Route

The route was organized around the Arouce Castle - effectively Lousã, a small town of Portugal (in the past called “Arauz”), has a medieval castle (a small watchtower) that, according to the documents, was sent to be rebuild by King Sesnando (the Mozarabic governor of Coimbra, after the reconquest of the city by Fernando I in 1064), along with the castles of Penela, Miranda do Corvo, Soure and Montemor-o-Velho, to strengthen the defense of the city of Coimbra, in what would come to be known as the “Linha de Defesa dos Castelos do Mondego” (Line of Defense of the Mondego River Castles).

Specific questions were intended to be answered:

- Why is the castle here?
- To what context the region “Arauz” belongs?
- What are the earliest documents referring to this toponym?

- What traces and inheritance the Muslims left us?
- How the territory was defended and organized at that time of reconquest?

Also the study of the Pillory, and its inclusion in the route as a georeferenced point, allowed to address the issue of populating the place and simultaneously enabled to understand the essence of the municipal power and the evolution of the local government.

The route has approximately 3.5 km, starting at Lousã Escola Básica N. 2 (Middle School N. 2) and ending at the Castle, with 8 georeferenced points of patrimonial interest and that illustrated the curriculum subject matter under study. The route driving was assured by "Mem Afonso", the mayor of the Castle in 1154, that students turned into an avatar and to whom they gave voice - the texts for each georeferenced point (resulting from the research done) were recorded in Mp3 files (with a student voiceover) and inserted into the route points (see Figure 1).

Figure 1. Following the Castle route and stopping at a point (Pillory).

Aiming to make the "Castle Route" more dynamic, in some places, Geocaching activities were associated (see Figure 2).

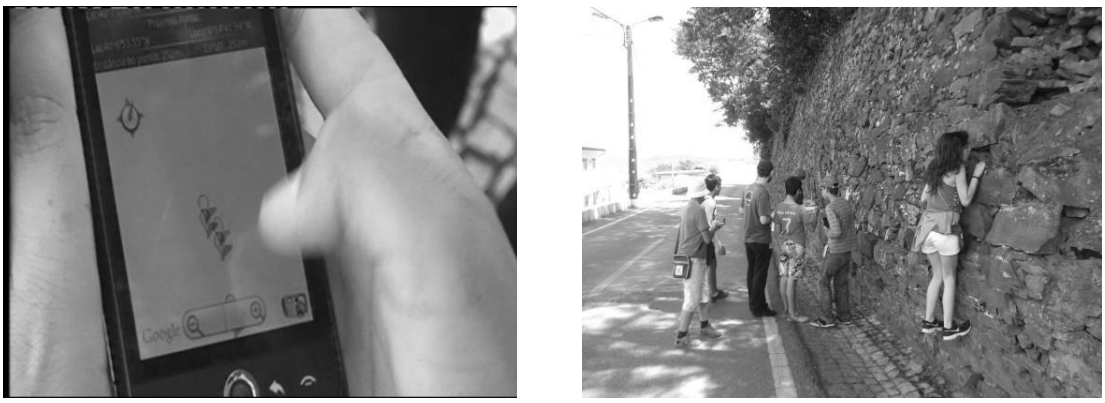

Figure 2. Editing a "placemark" of the Castle route and doing a geocaching activity (at the Castle wall).

After the field trip, the several recorded group routes were downloaded to the computer, edited and visualized in the classroom, along with one edited by the teacher (see Figure 3).

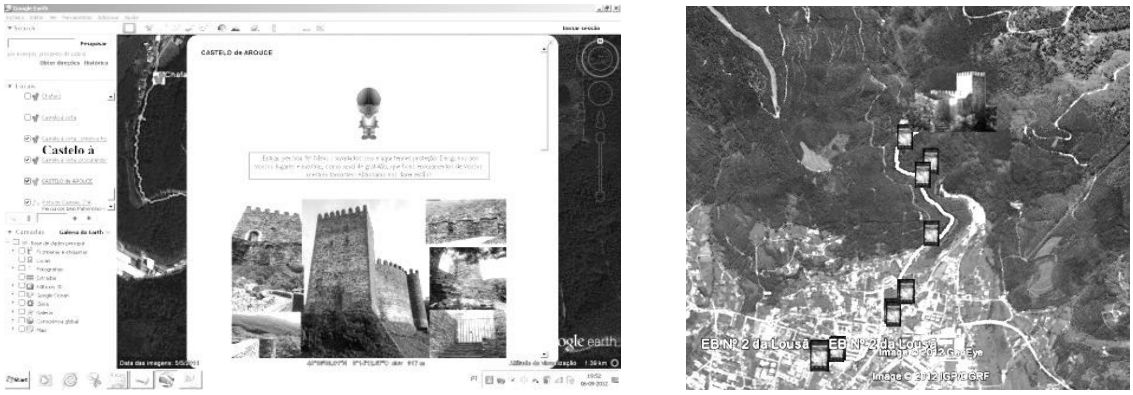

Figure 3. The Castle route, a specific "placemark" and the whole route.

After the whole activity was completed a survey was developed by the teacher and passed to the students. The analysis of the survey results allow us to conclude that the activity was very positive, that students liked to do it and that they learned from it. Students said for instance that:

- The activity "has helped to know better" and "to realize the value and the meaning of heritage."

At the level of historical understanding, responses given showed that there was a better awareness of the notions of space/time and of the role that each one can play in the society in which they live, being this way enhanced the social function of history. It can therefore be concluded that the process has been a dynamic and motivating one where technology leveraged a collaborative and constructive learning and that contributed certainly to the development of the thinking and historical consciousness of the students, who, in a critical and autonomous way, were able to establish the link between the past and the present through the use and creation of dynamic content.

The technological resources used potentiated a collaborative and constructive learning, providing a pathway to a distant past. The technology "connected" students, allowing them to "experience" history and overcome the barrier of abstraction that sometimes hinders knowledge.

The used methodologies, supported by the technological resources motivators and facilitators, allowed to achieve the objectives previously defined:

- Strengthening of historical consciousness and identity;
- Respect for the preservation of cultural heritage;
- The importance of heritage and local history in the students' cognitive process and motivation;
- The need to bridge the gap between the past and the present through the discovery of the thread of the human history, in different times and places;
- Their own knowledge construction using last generation technologies.

4. CONCLUSION

The school has to be "one of the pillars of the information society" and provide motivating and enriching learning environments that accompany the evolution and change, in a process of knowledge sharing. Research and studies say that for today's children, who grew up with television, video, Internet, visual modes of learning are extremely important, so the technologies are changing the way we live and learn (Druin, 2003). Therefore, they have to be seen as allies of the teacher in any area of the curriculum and also in History. Not for its use in itself, but because they enable the development of core competencies in transforming information into knowledge: "We believed that this conceptual gap between the child's everyday experiences and the abstract formalisms that have evolved in science could be closed by using the potential of multimedia software" (Scaife & Rogers, 1999).

It is therefore essential that teachers take advantage of "a strongly positive view of technology" for the youth ((Druin, 2003, p. 3) and use ICT as a factor of change of practices and an ally in the process of teaching and learning: "Preservice teachers must not simply acquire skills that make them proficient at using

technology, but also learn how to use technology to make their teaching better than it would be without it" (Mason, et al., 2000, p. 109).

With the HPL Group it has put into practice a model of computer-mediated learning, based on a socio-constructivist pedagogy. Experience with this small group has shown that students learn more and better when they are the authors of the knowledge construction process, that the construction of teaching materials gives great significance to learning and contributes to the development of reasoning and critical thinking, that the work with the sources and the research in a local context is possible, motivating and challenging. The technology "connected" students, allowing them to "experience" History and overcome the barrier of abstraction that sometimes hinders knowledge.

In education, particularly in the teaching of History, ICT and media are an asset that have to be integrated in the practices and instructional strategies, as they are facilitating tools that encourage creativity and autonomy, have a great potential for motivation, promote networking and information sharing, and last but not the least contribute, by young people, for the appropriation of technological literacy and skills that will allow them to integrate the Information and knowledge society.

"A typical feature of classroom instruction following recent technologies and social developments is the use of project - and problem-based learning activities that emphasize collaborative learning in authentic situations, the active construction of knowledge in social interactions with peers and experts, goal-directed information search processes and synthesizing across multiple sources" (Kumpulainen and Wray, 2002). The school has to keep on this path – assuming questioning and a critical and reflective attitude as the base of knowledge building.

Next steps of this study will involve to apply this approach to other topics of the history discipline in subsequent academic years, including to other grades, and to consider its applicability or integration with other disciplines and curriculum areas too.

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