Developing software for digital narratives: Interactive (immersive) narration (e - Nostos) and developing user griping environment with exhibits and Interaction Devices (Ava-x)

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Introduction

The role of museums has acquired distinct features in recent years and is not only associated with the maintenance and preservation of exhibits, but also with the educational opportunities it has to offer as an informal learning space (Falk and L. D. Dierking, 2000). In this context, a fruitful reflection has been developed for the strengthening of this process with the assistance of new technologies, along with the positive and negative aspects of this process highlighted by Cooper (2006). The aim of this paper is to present an alternative proposal for the utilization of new technologies in the MoE of The Centre for the Study and Research of the History of Education and the Teaching Profession (KEMEIEDE) of the University of Crete. More specifically, through the design and implementation of innovative digital systems concerning digital narrative, the augmented reality technology and the immersive possibilities offered by virtual reality, the museum narrative about the history of modern Greek education is presented at the MoE and is expected to emerge.

The utilization of new technologies in the context of a museopedagogical approach

Given the increased role that museums play in shaping and producing cultural knowledge, there is a strong interest in research for the next step regarding the negotiation of this knowledge by visitors (Hooper-Greenhill, 2006: 235). In this context, increased needs arise, as well as the view that there should be a visitor-centered approach to the design of museums, with the aim of adapting the museum to the user-visitor's life rather than the user to the museum environment (Marty, 2007). The development of technology could not leave this field unaffected, so the need to link the field of culture with new technologies has been pointed out, in order to redefine the concepts of space through techniques that are user agent (Daryl-Slack & Wise, 2002: 485).

Based on this logic, museum curators decided to introduce digital technologies that enhance user interaction and interface with the exhibits. The term meta-museum declares the effort to integrate new technologies and, especially, applications that

exploit the potential of virtual reality within the framework of the "conventional" report. There is the aim of providing interactive opportunities that will help the user to maximize opportunities to acquire the knowledge provided, at a level that navigating the actual exposure would not be possible. In this way the concept of hyper communication between the visitors and the people behind the exhibits (Mase et al., 2000: 107-108) is facilitated.

Over time, there has been further development in the field of new technologies. Through the possibilities offered by augmented reality applications, museums have been able to reinforce their real exhibitsboth with virtual figures and with the help of portable electronic devices. This raised the question of the relationship between the two worlds of actual and virtual reality. With the current data, four types of realities are emerging: actual, augmented reality, mixed reality and virtual reality. Therefore, there aretwo extremes in which we identify the totally real world onthe one hand and the totally virtual one on the other. The goal of this dual reality is not the separation of the two worlds, nor the substitution of one for the other. More specifically, complementarity is sought between them, so as to enhance the final museological achievement (Lifton&Paradiso, 2009: 12-26).

Presentation of digital applications

Based on the above theoretical considerations at the MoE of KEMEIEDE of the University of Crete, a fertile combination of new technologies with selected exhibits relating to specific periods of the history of Modern Greek education was attempted. More specifically, a digital repository (e-nostos) was created, which presents this raw materialin a multimodal way.

It has been noted that such narratives can support an active process of acquaintance and interpretation with the cultural material contained in museums, as they are essentially enriched cultural heritage collections (Marty et al., 2011). This applies to the case of the Greek Ministry of Education, as individuals who have practiced the teaching profession, in disturbed political periods of the modern history of Greek education, as well as ordinary students were invited to testify their experiences grouped into distinct thematic categories of high value for this scientific field. These testimonies are actuallyadditional material in the field of intangible cultural heritage, based on a "from below" view of historical knowledge. The enrichment of the narrations with selected sounds and picture-documentations of the history of modern Greek education imparts an artistic-directive character to the whole project. Moreover, itspeaks with the idea of artistic-based research, which is reflected in the MoE's report titled *The disciplining of the body in Greek education*.

The innovation emerging here is that through the multimodality of these narratives, the user has the opportunity to experience an immersive situation without using the augmented reality technologies that are usually a focal point in such an approach. It is already known (Stogner, 2010: 118-121) that the concept of narration

includes immersive qualities (narrative immersion), but emotional involvement and cognitive alertness of the user is achieved with the help of new technologies, while the user can even gain a participatory role. This is achieved in the e-nostos application through the option offered to the user to comment on the digital narrative, a fact which can complement or supplement the musical narrative.

Based on the above logic, the following digital application (aba-x), which offers a virtual immersion experience, was designed and implemented. Selected exhibits of the MoE were added to a virtual environment, using augmented reality technologies.The user can "experience" a pre-directed virtual-immersive environment with the help of a VR mask, aiming to critically recruit specific aspects of the history of modern Greek education, which communicate with the thematic categories from the application of e-nostos described above. The interface is made with visible hyperlinks, which can offer extracts from digital narratives that enhance the concept of immersionduring digital browsing. More specifically, the user has the possibility of actively engaging in the sketched scenarioduring the virtual tour, utilizing advanced ar/vr gloves that create the illusion of touch. In combination with the mask,they offer a full immersion experience.

Conclusion

The introduction of new technologies in a diversified museum narrative can help highlight the creative potential of the user and promote his/her participatory attitude, which results in the critical acquirement of the museumeffect. The aim of this effort is not just to highlight advanced technologies as innovative means of implementing the principles of modern museology/museum education. Such a perception is restrictive and follows a divisive approach, according to which there are two distinct worlds within the same museum exhibition. On the contrary, the aim of this project is the creative coexistence of advanced digital technologies with the museum exhibits themselves. This results in a circular path of user browsing from real to virtual exposure and vice versa (Barry, 2006). In this museum report the concept of immersion plays a key role in achieving this connection. The actual exhibits are placed in a visual environment of critical approach and their presentation leads to this direction, while new technologies attempt to reinforce this dimension.

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