

Across Education and Interaction: How TEL and WELL can serve museums and their visitors

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Countless projects are being developed around the world to improve the experience of the public in cultural spaces. Institutions are interrogating themselves on how to embrace the current shift towards a more digitised approach, and how to appropriately reflect it in their offer to the public. The scenario becomes even more interesting when discovering how disciplines such as Technology Enhanced Learning (TEL) and Wearable Enhanced Learning (WELL) can help undergo these transformations.

Museums. Narrative tools. Apps. Technology enhanced learning. Wearable enhanced learning.

1. INTRODUCTION

Mobile phones are nowadays one of the most familiar and easily accessible technologies that museums and their visitors can use to augment their educational experiences, before, during, and after the visit.

Countless projects are being developed around the world to explore how to improve the experience of the general public in cultural spaces and the institutions are interrogating themselves to understand how to embrace the change that is happening in society, towards a more digitised approach, and how to appropriately reflect it in their offer to the public.

2. TECHNOLOGY IN THE MUSEUM SPACE

2.1 The Rise of New Professions

Within the museum space, with the help of several organisations that work in synergy with them, experts are putting in place new practices around new professions. According to the eCult Role Profiles Report (2015), the most needed ones appear to be:

- Digital Curator

- Interactive Cultural Experience Developer
- Digital Cultural Asset Manager
- Cultural ICT Guide
- Online Cultural Community Manager
- Cultural ICT Consultant

The report has been developed by the expert stakeholders of the European Commission funded project *eCult Observatory* and it has been presented in Athens at the *Digital Challenges for Museum Professionals International Conference* in September 2015.

Despite cultural jobs representing about 5% of the total employment over Europe (European Statistical System Network on Culture, October 2015), there is currently still a big gap between the cultural market needs and the work force.

The *eCult Observatory 'Skills'* project addressed e-Competences needed in cultural heritage jobs to close the gap and combat unemployment, in particular among young people.

2.2 Mobile Devices as a Learning Resource: The Role of Technology Enhanced Learning (TEL)

As Falk and Dierking (2000) first proposed, when designed well mobile digital technologies can

enable visitors to customise their visit, extend the experience beyond the museum, and 'layer multi-sensory elements within the experience' through the use of digital media.

The benefit of using mobile devices in museums as a learning resource becomes evident through the lenses of the Technology Enhanced Learning (TEL) methodology. In particular (Fleck et al., 2002), mobile devices in museums have been studied as performing five key functions:

- Providing information about exhibits;
- providing instructions for how to use the exhibits;
- helping visitors communicate with each other;
- exhibition guidance in a meaningful order and
- recording information for later retrieval.

An interesting example of TEL in the museum space is given by the Gidder (Groups in Digital Dialogue) project: a study of high school students learning about modern and contemporary Art History, in activities and technologies that move across classroom and museum contexts (Pierroux, 2007).

2.3 Collaborations and Findings through the Art Wonder app, by Art Wonder Ltd.

For the past two years, the author has worked on developing an educational and interactive tool based on the above-mentioned principles: *ArtWonder* (app and CMS), which has been presented last year at EVA London 2015 during the Research Workshop and is now the first commercial product of Art Wonder Ltd.

The author has worked with the Victoria & Albert (V&A) Museum in London in late 2015 to publicly test the app, which a) allows visitors to access information on specific exhibitions in a digital and multichannel way; b) enables them to connect with other people in the space, using an internal geo-location solution.

At the V&A, the system has been tested during the Digital Design Week, installing iBeacons, and with a presence of around 700 visitors over two very intense days. The response from the public has been very positive and the Company is now working on improving the system to be able to offer the service to an even wider audience.

The iBeacons have proved to be a technology that is not always completely reliable, at least not to the degree of precision that we would like to achieve. Partnerships with new providers are being taken

into consideration, with the aim of improving the final product.

The author has also recently developed collaborations with the London National Maritime Museum (NMM), where she has been taking students to test UX and UI prototypes for a number of apps, including AR and VR led ones, and experiment with iBeacons.

Both the V&A and the NMM responses have been positive and encouraging, and new projects are under discussion for the near future.

The potential in this field is so high that it is important to keep funding the projects and be able not only to develop a good concept, but also to prototype and test it, with the final aim of bringing it to the market or to the stakeholders. This way, researchers and entrepreneurs can aim to make an impact on the lives of the majority.

2.4 Exploring Wearable Enhanced Learning (WELL)

In regard to Wearable Enhanced Learning (WELL), this field is beginning to have an impact in Museum interaction design. The author's interest in the field has been growing since she approached it. It is interesting to observe how there are Wearable Technology Shows that display innovations being created in various fields. Amongst the many products and prototypes, the ones publicly targeted to the cultural heritage sector are still missing in those arenas.

The landscape is very varied, and many projects are not of easy discovery. We are going to examine a short list of projects and products.

The 3-D printed *Finger Reader* device, developed by the MIT Media Lab, fits on your index finger like a ring. If you trace a page with your finger, it will read it out loud for you.

Special software scans the text and gives both audio and haptic feedback, letting the wearer know things like where the line begins and ends or to move to a new line. The algorithm can also detect and give feedback when the user moves away from the baseline of the text.

The FingerReader is a device that could prove to be useful not only as a tool for the visually impaired but also for second-language learners, people with dyslexia or other language disorders, young children, victims of brain trauma, and tourists.

It can be used to assist audiences such as the elderly with reading labels, prescriptions, various types of printed texts, menus in restaurants, business cards.



Figure 1: MIT Finger Reader: ring in use.

OrCam-MyEye is an intuitive portable device with a smart camera mounted on the frames of your eyeglasses. OrCam harnesses the power of Artificial Vision to assist people who are visually impaired. It recognizes text, products and faces, and speaks to you through a mini earpiece.

A third interesting example is the Body Metrics exhibit at the Tech Museum of Innovation. On its surface, this permanent exhibit by Kaiser Permanente leverages the ongoing evolution of the wearable technology space; more deeply, it is about understanding how wearable technologies can impact our lives. Guests are given wearable devices that help them track both their emotional and physical states and reactions. They are then shown how small changes can make a positive difference in their health and lives over time.

More practically, guests check out a Sensor Kit, which measures six factors: activity level, tension, mental focus, talkativeness, attitude, and the number of people nearby.

The kit itself includes a smartphone that explores the wearer's environment, a NeuroSky wireless headset that measures brain waves, and a Somaxis device that measures heart rate and muscle tension. The exhibit also features a data pool, a powerful 12-foot custom-developed touch screen that displays body metrics amidst visitor avatars. Special features allow guests to try to sync their heart rates with other visitors, and to explore certain parts of the museum like an earthquake simulator to see how that impacts their body metrics.

In San Francisco, the de Young Museum's guests were among the first worldwide to be able to participate in an actual exhibit featuring Google

Glasses. Run by the Fine Arts Museums of San Francisco, De Young partnered with the designers and team at GuidiGO and Google to develop special content to be viewed as part of an exhibition of artist Keith Haring's work.

As the GuidiGO team reported:

Glass Explorers will access archival audiovisual materials that feature Keith Haring speaking about his work, the influences of graffiti and street life on his aesthetic, and the social justice issues about which he was most concerned. The tour also includes multiple interviews with those who were closest to Haring, including his sister Kristen Haring, his close friend and former studio assistant Julia Gruen (now executive director of the Keith Haring Foundation), fellow artist David LaChapelle, and Tony Shafrazi, who gave Haring his first official gallery show.

3. CONCLUSIONS

Nowadays, across the various areas of expertise and museums' departments worldwide, the discussion is very alive. Museums are increasingly showing interest in developing collaborations with third parties and are offering global participants and visitors a wide number of new opportunities to engage with the collections.

A coordinate use of several technologies could transform the visitor from (semi) passive spectator to orchestrator of her/his own museum experience, this way keeping their interest alive and marking a step towards the "museum of the future".

It seems to be worth further investigating the impact that the Wearable Enhanced Learning (WELL) methodology appears to have in the Museum Interaction Design field, together with

TEL. If it is clear that smartphones and other mobile devices have a big impact on how museums present information, it is also plausible to think that wearable technology may reveal itself capable to take the visitors more deeply into exhibits. Through wearable technology guests could become able to understand their own physical and emotional reactions to the museum environment and to experience enhanced exhibits without having necessarily to depend on a smartphone screen.

I would like to develop a new research question here: would the museum space ultimately be enhanced by these new narrative tools based on innovative technologies?

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