A Natural History Museum Experience: Memories of Carvalhal's Palace – Turning Point

Vanessa Cesário[1]([✉]) [iD], Sandra Olim[1] [iD], and Valentina Nisi[1,2] [iD]

[1] ITI/LARSyS, Lisbon, Portugal
{vanessa.cesario,sandra.olim,valentina.nisi}@iti.larsys.pt
[2] Instituto Superior Técnico, University of Lisbon, Lisbon, Portugal

Abstract. Teenagers are a large pool of potential museum audiences. This age group is identified as an audience group that is often excluded from a museum's curatorial strategies [1] and appears to be generally disinterested in what museums might offer [2]. Without some degree of digital interactivity, it is challenging for a museum to remain interesting and relevant to a young tech-savvy audience [2]. Our application is a location-specific gamified narrative deployed at the Natural History Museum of Funchal (Madeira island, Portugal) which embraces the potential of mobile interactive technologies and digital storytelling to promote engaging tours for teenage visitors, encouraging more active, enriching and tailored experiences. Through our interactive story app, the audience is challenged to explore the museum to unlock fragments of a narrative that relates to the main story.

Keywords: Museums · Teenagers · Digital storytelling · Augmented Reality

1 Museums and New Mobile Interventions

There is an increasing concern about traditional exhibition and communication style of museums, which often fails to engage teenagers and denies the potential of museums to be a fundamental institution in a society which values cultural heritage [3]. Today museums are starting to embrace mobile applications and digital content as new modes of communication and have reconfigured the traditional narrative subject. These mobile interventions can engage visitors through memorable experiences [4] combining gaming and storytelling, requiring minimal space of reorganization of the exhibits and presenting options that can be tailored individually to suit particular exhibits. Moreover, location-based experiences are also valuable when applied to cultural heritage as a way to display historical content [5].

2 Natural History Museum of Funchal (NHMF)

The museum building, dating back to the 18th century, was originally a distinguished palace of Victorian style (wooden floors and ample doors in order for women to move

around in their ballroom dresses). The NHMF is the oldest museum of the island and does not currently use any digital or interactive technology to enhance the visitors' experiences. With the goal of contributing to fill in the gap regarding teenage engagement in museums [1], we designed the *Memories of Carvalhal's Palace* dual experience, a storyfied game (*Haunted Encounters)* and gamified story (*Turning Point*). These two experiences make use of the same characters and similar content, but employ different engagement strategies, geared towards better understanding teenagers' preferences and needs in museum contexts. The scope of this contribution is to describe the gamified story experience in details. The *Memories of Carvalhal's Palace – Turning Point* (Fig. 1) has been designed exclusively for the NHMF and based around the museum's permanent exhibition of taxidermied animals and aromatic plants of its garden, and it takes around 30 min to complete it.

choose character	scan runes	follow story
find all facts	learn about the natural patrimony	
check your progress	take selfie with the character	

Fig. 1. Envisioned interaction of *Turning Point*.

3   Fictional Plot

After consulting with the museum's staff and director about the museum goals and offerings, an original story plot and fictional characters were created in order to ground the experience onto the NHMF's exhibits. The museum collection includes a great taxidermied monk seal, one of the most endangered species of the Atlantic Ocean. Such species found shelter in the Madeira archipelago, which finally established a protected nature sanctuary devoted to the surviving monk seal in late 1980. This taxidermied species is also one of the most striking exhibits of the entire collection due to its size. This exhibit

prompted our creative team to seek inspiration from the northern European legend of the Selkies, or women seals, in order to create the characters and a mystery plot to engage a teenage audience. Selkies are said to live their lives partly as animals, and partly as women, who shed their seal skin to become human and live, marry and procreate on land. The call of the sea will always haunt them, but they need to keep their seal skin at hand in order to be able to slip back in it to fulfill this need. The aim of this fictional plot is not only to familiarize teenagers with the marine and terrestrial natural wealth of the island, but also to use this legend to stimulate awareness towards rare and disappearing species, and conservation of the natural patrimony, in particular of the endangered monk seal exemplars. The fictional plot of *Turning Point* revolves around one of the heirs of the aristocratic Madeiran family that owned the palace, where the museum is currently located. The young heir falls in love with a Selkie woman, but she disappears in mysterious circumstances leaving him waiting at the altar. He never comes to terms with the grief caused by this loss and, as restless ghosts often do, he lingers around the museum's rooms as an angry spirit. The audience becomes aware of the ghost's drama by collecting fragments of the story that unfolds in the museum's garden. After empathizing with the fictional characters, the audience is then prompted to help them find the truth by interacting with the museum's taxidermied species.

3.1 Mechanics

With *Turning Point,* users are encouraged to go to specific physical locations of the museum to unlock the story plot points and solve the mystery behind it. The basic mechanic relies on finding Augmented Reality (AR) markers that indicate the presence of story content, and unlocking story fragments that progress the plot. The story is narrated through photorealistic images of the characters accompanied with dialogues rendered as voice over audios and text (Fig. 1). The user is also presented with several historical and scientific facts woven into the story, such as the existence of the Madeiran tradition of whale hunting and the inherent massacre of the seals as a threat to the old fishing industry. In the second part of the experience, which happens inside the museum, each interaction with a taxidermied species will yield scientific facts about the fauna and flora of the island together with key elements that will help the audience put together the truth behind the bride's disappearance. The story is divided into four acts, containing 16 audio visual fragments in total and is presented in the form of a gamified narrative. Its first part, unveiling the couple's drama, is structured linearly: the app asks the user to search and interact with specific species at a time. In its second part, designed as five non-linear interactions, the audience can choose the species they would like to interact with to help the protagonists uncover the truth. This non-linear part does not change the unfolded story as a result of the order of the markers the users scan. Still, users must go to all the species to proceed in the experience. They will finish with the same amount of information if they had chosen other order to listen to these story fragments, then no computational approaches are used.

Interface. Upon starting the app, the audience is presented with a tutorial indicating how to interact with the app and how to use its interface. A custom-made map of the museum will help them orient themselves in the real space and find the story content.

The audience can also find out how far they have progressed into the story content according to the main timeline and where to look for markers and species in the physical premises.

Game Play: Choosing Storylines. After the tutorial, the user is asked to choose one of the two main storylines, and follow the story from the point of one of the two main characters – the couple Xavier and Marina. Depending on which one of the two they decide to follow, the events will follow a different point of view and involve different animal species in the museum.

Augmented Reality Markers. In order to unlock the story plot sequence, the app will guide the user through various sections of the museum, where they can find AR markers, each of which unlocks a new story fragment and is connected to a species of plant or animal. Markers can be scanned using the app, and each story fragment emerges after each marker is scanned.

Rewards. Upon completing the story, the user can restart the experience and follow the other character's point of view and reinforce their knowledge of the story, while interacting with different exhibits. Care has been taken not to repeat content inside the museum, and to have the user interact with different species from those encountered through the previous experience. Furthermore, users are also rewarded with the possibility of taking a picture with the story character whose point-of-view they have experienced through the app.

4   Concluding Remarks

In *Turning Point* teenagers are challenged to interact with the flora and taxidermy fauna of the Natural History Museum of Funchal while following a multiple-point of view gamified story plot. After the users select which point of view they want to follow, they are guided through the museum to scan AR markers in order to unlock parts of the story embedded with historical and scientific information. The teenage visitor not only learns about the species of aromatic plants and animals represented in the museum but also about its historical significance, which was once the palace of a noble Madeiran family.

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