Heritage Hunt: Developing a Role-playing Game for Heritage Museums

Suzanne de Kock and Marcello A. Gómez Maureira

University of Malta, Msida MSD 2080, Malta
suusdekock@gmail.com
ma.gomezmaureira@gmail.com
http://www.um.edu.mt/

Abstract. Artefacts in museums are fundamentally de-contextualized in the way that they are displayed. This papers describes the development of *Heritage Hunt*, a mobile game prototype developed for the National Museum of Archaeology in Malta, that looks at roleplaying and the portrayal of history at a small-scale level to promote a better understanding of the every-day cultural context of displayed artefacts. We conducted a small, explorative study across different development stages to assess this approach. The final prototype was tested in the museum space, with results indicating that roleplaying can be beneficial to direct the attention of visitors towards less prominent artefacts, as well as encourage visitors to consider different perspectives in history.

Keywords: museum games, role-playing, game design, user experience testing

1 Introduction

Archaeology, history, and natural history museums provide visitors with the opportunity to learn about the past through the immediacy of physical artefacts. They provide a space for curiosity and dialogue, frequently augmented by textual information or interactive interfaces. Yet, the preserved artefacts remain fundamentally de-contextualized; a piece of history, often displayed mere steps away from another artefact that may have been created hundreds of years later. After all, the original context of each artefact lies centuries in the past, if not longer, and is connected to a space that rarely corresponds to its modern whereabouts.

In this paper we discuss the design and creation of *Heritage Hunt*, a video game for tablets and smart-phones that attempts to bridge this gap. The game aims to inform its players of the everyday cultural context of the artefacts on display, how they were used at the time, and how different people of the time might have looked at them in different ways. In order to achieve this goal, the game uses elements of role-playing in order to give the player a sense of personal involvement in the narrative of the game. It contextualizes artefacts through small fictional narrative elements in a historical setting; supplementing already displayed information that focuses on the larger scope. As a research effort, *Heritage Hunt* is an indicative case study that aims to explore the benefits and challenges of developing a narratively-driven, multi-user mobile game for museums focusing on history. As part of this effort we present the results of user tests at

different stages of the development, and the modifications that were informed by them. Due to the small scale nature of the research, we see its use primarily in informing museums with limited resources. Our message therefore is less that playful interactivity is a completely novel concept, but rather that their use is not common place and should be considered even in smaller venues. Here, the particular way in which *Heritage Hunt* presents history can provide an example to build upon.

2 Related Work

Before we describe the development of *Heritage Hunt*, we want to highlight prior work that informed the development of this project; starting from considerations regarding the museum environment, and the impact of role-playing on social interactions.

2.1 Learning in Museum Spaces

In general, a wide range of demographics visit museums to learn in an informal manner [12]. Museum visitors have varying levels of motivation, prior knowledge and interest, and learn in highly idiosyncratic ways. This diversity in learning and engagement means that the museum has to be versatile and prepared to accommodate the needs of various kinds of visitors. Falk and Dierking [6] have proposed a model of learning in museums that recognizes a personal, sociocultural, and physical context.

The personal context focuses on the individual motivations and the prior knowledge that visitors bring to the museum space. Whether a person learns or not depends on whether they have the motivation and attention span to do so. What Falk and Dierking propose is that the museum has to make the effort to motivate the visitors and give them many opportunities to engage with the exhibits.

The sociocultural context of museum learning focuses on how people learn in groups. Much of the time visitors to museums come in small groups; they are rarely visited alone [12]. Furthermore, a study conducted on the learning experience of students in a museum showed that the students were more likely to remember parts of their visits that included social interaction [8].

The physical context is considered to be the architectural structure of the museum as well as any physical media within. The displays, in terms of artefacts, written signage, and interactive displays, all count towards the physical context of museum learning. This includes the layout and the order in which a visitor experiences the exhibit [2, 6]. Even the language used on informational plaques affects the relationship between the museum and the visitor [11].

2.2 Interactivity and Museums

While interactivity in general does not require technical components, we base our project on technically afforded interactivity. Frequently, these interactive experiences tend to be one-way streets of information accessed by menial tasks, such as the press of a button or the manipulation of a screen. Witcomb [14] questions the nature of this sort of interaction, and how beneficial it is for the visitor considering the linearity of

the information flow. An audio guide would be an example of this, where the information presented is completely linear with no significant input from the user. In contrast to such linear interactivity, spatial interaction [9] does not 'feed' information to the visitors. Instead it lets the visitors draw their own conclusions, using the imaginative aspects of interactivity. It invites the visitors to become co-authors of the content presented to them. The visitor is presented with small standalone narratives that are spread over a large space. There is a loose organisation in the design, but the visitors are free to move around the museum's exhibits to pick and choose what they want to experience. Dialogic interactivity [14] revolves around creating a dialogue between the visitor and the content. In this form of interactivity, content is presented with a central theme under the recognition that artefacts have a context that is often not fully known, and is thus open for discussion. Witcomb [14] encourages museums to become a space in which discussion is promoted by posing questions and showing different points of view, and acknowledging that there is no single truth when it comes to interpreting artefacts that are taken out of their original context.

2.3 Roleplaying Games

When looking at games that combine a social context with storytelling, roleplaying games (RPGs) are arguably the most well-known implementation of these aspects. Roleplaying, whether mediated through digital devices or not, is defined by putting oneself into the shoes of someone else; a character who a player of the game makes decisions as. Bowman suggests that "[a roleplaying game] should establish some sense of community through a ritualized, shared story-telling experience amongst multiple players. RPGs also should involve some form of game system, which provides the framework for the enactment of specific scenarios and the solving of problems within them." [4, p.11-12]. A large part of what motivates a player to empathize with a character is through decision making on behalf of that character. Players face obstacles by the game system and have to figure out how to overcome them with the tools at their disposal [5]. Often they must agree on a course of action together with other players, thus introducing additional opportunities for social interaction.

Heritage museums use historical reconstructions as a way to provide something akin to live-action roleplaying to involve the visitor in history [10]. These reconstructions use actors and roleplaying to make history come to life for the visitor, and the visitor's participation is crucial to the experience. Other ways that museums and sites have been engaging the visitor are virtual reconstructions. They allow the player to traverse a digital space to see the way scholars think history could have looked. An example of this is *Pterosaurs: Flight in the Age of Dinosaurs*, installed at the American Museum of Natural History, which lets its players traverse a digital space as a pterosaur [7].

Aside from reconstructional roleplaying, museums have also been using interactivity in museums to put their visitors in the shoes of the researchers and get them to understand the process of archaeologists, anthropologists, or curators. An example of this is *MicroRangers*, and application-based game that teaches the players about microbiology and ecosystems, sending them on missions given to them by virtual scientists [1].

3 Research Approach

The primary focus of this study is to explore the potential of using roleplaying elements in combination with an every-day historical narrative within a mobile video game. This exploration is guided by principles of user experience research, which "focuses on a person's perception and the responses resulting from the use or anticipated use of a product, system, or service" [3, p.4]. When considering the approach of user experience research for game development, Takatalo et al. say that "although the designer may have a clear idea of the user experience that the game system should provide, this experience will not necessarily be the gamers' experience" [13, p.24].

In practice this meant that the development of *Heritage Hunt* alternated between phases of conceptual and technical work on the game, and phases of testing prototypes of the game (at various stages of completion) with participants. Apart of evaluating aspects of usability, we were further interested in whether the design goal of the game – promoting an understanding of the everyday cultural context of artefacts – was achieved. At this point we need to point out that the scope of this research is necessarily limited to that of an exploratory study due to budgetary constraints. As such the project should be understood as an early investigation that should be followed by further research and practical development.

The user experience testing that was conducted for this project took place in the form of focus groups carried out before the conceptualization of the application, preliminary tests with a paper and a digital prototype, and an on-site testing session at the National Museum of Archaeology in Malta with the final iteration of the digital prototype.

4 The Game

Heritage Hunt was developed specifically for the Phoenician exhibit of the National Museum of Archaeology in Malta. In the game, two or three players are tasked to solve a mystery surrounding the fictional robbery of a grave that takes place during the time of the Phoenician empire. All events and interactions of the game are mediated by a mobile application that acts as digital 'game master'. Players discover details of the story as they investigate specific artefacts in the exhibit with the purpose of gathering clues to solve the crime. The application is responsible for revealing these story details only when players interact with corresponding artefacts, which is done by scanning a QR code identifier.

Players choose one of three characters at the start of the game, each of which receives details of the story that are unique to the perspective of that character. In order to discover all clues (and thus, complete the entire narrative), players must share the information they have gathered through their game characters with each other. In the end, players are asked to decide which of the suspects they have come across has committed the crime, resulting in either a wrongful, or rightful conviction, each of which is described within the narrative of the game.

By describing the same artefact in different ways according to a character's viewpoint, the game encourages players to understand an artefact in its day to day context,

Fig. 1. Tomb artefact acting as initial starting point (left); visitor scanning the QR code of an artefact to reveal a clue (middle); screenshot of the game showing the main hub (right).

as well as its context in relation to different people at that time in history. The game focuses on a small, localized narrative of an event that could have taken place in a small community as a way to create an experiential understanding of the time period, and the role that artefacts played in society at that time.

4.1 The Characters

The players are asked to choose one of three characters: the aristocrat, the servant, or the merchant. These characters were chosen for their archetypal roles in society, giving the players a choice of viewpoint through which to view the world. The use of three characters was chosen in order to account for groups of visitors to museums as well as to have a manageable distribution of clues. The game can also be played by two characters, which increases the amount of information and clues that is given to each individual character.

4.2 Playing the Game

The game starts at a particular artefact: the physical re-creation of a Phoenician tomb (see Figure 1). By having a set starting point, a place could be chosen for players to stand idle and read the game content without blocking the flow of visitors in the exhibit. In order to start the game, each player scans the QR code at the tomb. They are then asked to choose the character they want to play as. At this point, players are given information about the character, the way that they relate to the grave and to each other, and the suspects of the crime. Following this point in the game, players can investigate at their own pace, and in any order by finding other artefacts that have a QR code attached to them. Scanning these codes gives each character a different narrative, which may or may not include a clue to solve the mystery. Some clues are only given to specific characters. At any point during the game, players can re-read their own clues in the ‘Found Clues’ menu, or find a summary of what they have found and a description of

the suspects in the 'Suspect' menu. The 'Codex' menu provides additional information about the Phoenicians for curious players. Whenever players think they have enough information, they can accuse one of the suspects. They are then given a brief description of what happens to the suspect, indicating whether their accusation was correct or not. The game then ends automatically.

The length of a play session is largely dependent on how fast players gather clues, and whether they decide to look at other exhibitions in-between investigating game-related artefacts. In general, the game has been designed to take about 15 to 20 minutes when played at a slow pace, and with other museum-related activities taking place in the meantime.

5 Development Process

In this section, we describe two of the earlier tests (using incomplete versions of the game) that took place during development. Each test informed the development of the game in its own way, and served as an intermediary check to see whether design expectations were being met. The first version of the game was informed by two focus groups, with a total of 10 participants. These helped to identify issues with existing interactivity in museums and informed basic design decisions in early concept development. One such a decision was to develop for mobile devices, as they allow for a high degree of independence in when and how to interact with the game and cause minimal disturbance to the existing exhibit. Based on the comments and opinions gathered in these sessions, a first prototype (centred around a narrative-based game) was created specifically for the National Museum of Archaeology in Malta.

5.1 Paper Prototype Testing

The first prototype of the game consisted of an early version of the game narrative, printed on paper and conveyed to players with vocal instructions. The goal of this testing session was to find out how users might want to interact with the game, and whether the narrative of the game was considered engaging. Three participants, game design students that had not been part of the focus group sessions before, were invited to play the game as a group in a large lecture room. Printed photographs of artefacts were distributed across the room to roughly simulate the museum environment for which the game was developed. Participants were given a short explanation of the game and how to play it, while a moderator simulated the functionality of the digital application by revealing different parts of the game narrative depending on the characters that each participant had chosen. When all clues had been given, the participants were encouraged to discuss their findings and who they thought committed the crime. Afterwards the participants were interviewed together about their experience.

The test revealed that visual representations of involved characters and artefacts, while planned to be part of the game eventually, were considered crucial by the participants. Throughout the session, participants were engaged in the question of which of the suspects was responsible for the crime; something that remained a topic for discussion in the post-game interview. Discussion on the game's length and complexity

remained short, with participants stating that both seemed appropriate. Apart of this, participants stressed the need for a concluding narrative after accusing a suspect, which could in itself be used to reveal whether or not a group had made the right choice. Finally, participants commented on the fact that the game had provided them with a more 'personal connection' with artefacts that they would have considered uninteresting in a regular museum visit.

5.2 Digital Prototype Testing

After the testing of the paper prototype, a first digital prototype was developed. This prototype had the basic functionality of the game, such as scanning of a QR code to indicate gathering of a clue, as well as visual references in the form of photos of the artefacts. The digital prototype still lacked the functionality to complete the game, however, and the interface had not yet been designed in regards to visual aesthetics. Similar to the paper prototype test session, the digital prototype was tested in a simulated museum environment with photos indicating the positions of the artefacts. Three different students of a game studies course at the local university were once again invited to test the game. At this point we were primarily interested in observing how participants handled the application, and whether it was able to guide the play session without additional explanations. In general, participants behaved similar to those who had played the paper prototype: remaining mostly together as a group, discussing their take on the story whenever a new clue came in, and finally deliberating who to accuse.

In the concluding interview, participants highlighted the uneven text distribution amongst player characters and the slow response of the QR scanner as problems. While participants mentioned that the game gave them a human perspective on the artefacts, they also made clear that testing outside the museum setting was a limiting factor. Participants felt unconnected to the artefact itself and would have enjoyed to explore it up close, especially after having played through a narrative that involved them so prominently. Overall, the digital prototype managed to fulfil its purpose, as players remained engaged throughout, and were able to progress through the parts of the game that had been implemented by this point.

After the test session, we focused our development efforts on implementing the suspect accusation mechanic, improving the speed and handling of the QR scanner (e.g. by indicating a target distance through lining up the code with visual markers), and added visual elements to the application to make it more appealing.

6 On-site User Testing

The final test within the scope of this study used a feature complete version of the game, and took place at the National Museum of Archaeology in Malta. We received permission to test the game in the Phoenician exhibit for one afternoon, and were further given the opportunity to test the game with members of the staff to get feedback from their perspective, which we evaluated separately from the responses of museum visitors. One caveat for this test session was the request by the museum to approach visitors only on their way out of the exhibition in order to not disturb their regular experience. This

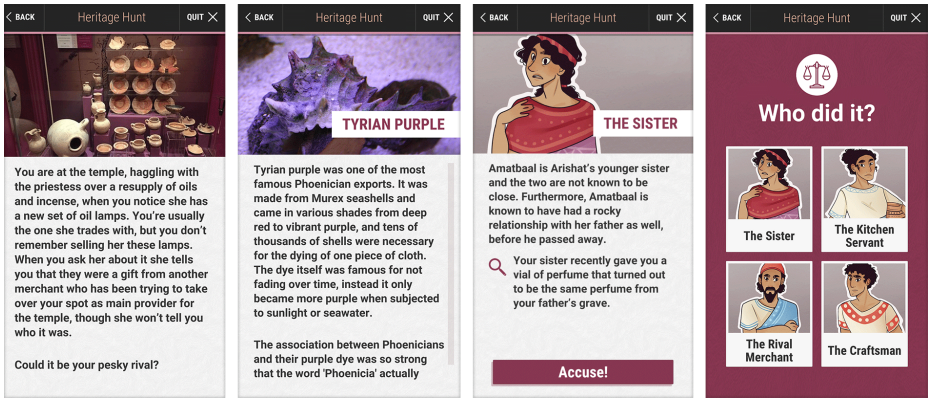

Fig. 2. Screenshots of the final prototype, from left to right: (1) clue found when scanning the oil lamp artefact, (2) codex entry relevant to the narrative, (3) suspect screen with clues found so far, (4) accusation screen.

meant that all test participants played the game with at least some prior knowledge of the featured artefacts. Data for this test was collected in two steps: a researcher observed the way participants played, and afterwards conducted short exit interviews with the participants. The following questions were asked, all of which were followed up with the request to elaborate:

1. *What did you like/dislike about the game?*
2. *How did going through the exhibit with the game compare to going through without?*
3. *Would you play a game like this again?*
4. *Did playing the game change the way you understand the Phoenicians?*

When interviewing staff members, we replaced the last two questions with: *(3) Do you think that an application like this would be a useful addition to a museum exhibit?* and *(4) Is there anything you would like to see added or changed to make the game more museum friendly?*

Participants were each given a small tablet with the application running, as well as instructions of the goal of the game, and how to operate the QR scanner (i.e. where the camera on the device is located). After participants had finished the game and accused a suspect, a researcher would take them aside and ask them about their experience.

6.1 Testing Results

Tests were conducted with 13 people, 3 of which were museum staff. Test sessions involved two 2-player sessions with senior couples, a 2-player session with a middle-aged couple, a 2-player session with students, a 2-player session with children (under the age of 10), and a 3-player session with the museum staff. In general, testing sessions lasted between 10 and 15 minutes. In contrast to prior test sessions, all player groups

spread out in order to find clues, only convening once they had found all the clues. Four of the participants went through every piece of information offered by the application (including the 'Codex' screen with supplementary information), while the other nine only used the 'Codex' and 'Suspects' screen when they were stuck. In most of the sessions, participants asked for assistance by the researcher to inform them whether they had found every clue available. Apart of this, older participants tended to require assistance with scanning QR codes, suggesting that our efforts to make this aspect more user friendly were not fully successful.

In the post-game interviews, both staff and visitors expressed enjoyment of the game, highlighting that the game provided additional background regarding the everyday context of exhibited artefacts. All groups suggested they would play a game like this again if given the chance. The test session conducted with two children suggested that the narrative was difficult to grasp in its entirety for younger participants, but at the same time did not seem to hinder engagement with the mystery, or the involved artefacts. One couple mentioned that they liked how the game presented them with a different experience than they normally would have found in a heritage museum. Another couple enjoyed that they had to think about the clues critically, and required thought from the players to solve. In general, most participants expressed interest in the narrative and its characters, as well as having the narrative revolve around the exhibited artefacts. On the other hand, one participant thought that the artefacts were not involved enough, and found that too much time was spent looking at the game screen. Apart of the game content, three of the tested groups mentioned trouble with using the QR scanner, though they also mentioned that handling became easier once they got used to it. One participant mentioned that a more expressive positive or negative feedback would have been appreciated at the completion of the game. Another comment was made in regards to the social impact of gathering to discuss clues, which one participant mentioned as the best part of the game. When asked about whether the game changed the way they understood the Phoenicians, four of the visitors said that the game did not change their perspective much, while another four said that the game did give them new insights. One participant said that he hardly knew anything about the Phoenicians at all, as he did not like reading the information plaques at museums, and so the game taught him more than he knew before. The two remaining participants were too young to understand the question.

Finally, in our interview with the museum staff it was mentioned that the social aspect of the game might disrupt the exhibit for other visitors. They suggested a designated spot outside of the exhibit (but still inside the museum) where the players might be able to discuss their findings. The museum staff was particularly enthusiastic about the game's ability to raise interest for exhibition artefacts that could be considered less 'eye-catching' than others.

7 Discussion

Out of all test sessions, the final on-side test session was, predictably, the most revealing. While this does not devalue the impact of the prior evaluations, it is also clear that simulated evaluation sessions can only serve as a rough indication. Where before play-

ers had stuck together and discussed their thoughts after each new clue, in the museum setting all of the participant groups split up and only discussed their findings at the end. The participants were observed to be quieter, likely due to the fundamentally hushed atmosphere of the exhibit. They engaged in fewer discussions throughout, instead reading both artefact signage and game narrative on their own, before coming together to complete the game. Something that did not show in our previous tests (in a simulated museum environment) was that many people go through an exhibit at their own pace, even when visiting in a group. Several of the participants had gone around on their own during their initial visit of the exhibit as well, and then continued this behaviour when they started playing the game. The lack of social interaction did not seem to impact whether participants enjoyed the experience, however. From our perspective, there is no 'wrong' way to play the game, and especially given concern by the museum staff that discussion could distract other visitors, it is encouraging that different forms of play can be accommodated. The suggestion of the museum staff to provide designated areas at which a suspect can be accused could easily be implemented and would allow the museum to strike a balance between not disturbing non-playing visitors, while offering visitors the possibility to engage with artefacts through a mobile game.

The test provided valuable insight into how different museum visitors interact with the game, especially when comparing very young players with seniors. Although seniors experienced some trouble in using the tablet, they were still interested in the game itself and were observed to be very engaged with the content. They, also, answered that they would play a game like this again if they had the chance, suggesting that the game does not have an upper age limit. Although an increasing amount of seniors will likely be familiar with smartphones and tablets as these devices continue to become more ubiquitous, developers should consider further ways of mediating issues in using the game's technology (e.g. through interface design or exploring alternative hardware).

One of the user tests included two children of the ages seven and nine. The text-heavy nature of the game, for which a minimum level of reading comprehension is required, proved to be too complex to follow for the seven-year-old. The nine-year-old was engaged in the experience, despite not being fully capable of drawing conclusions from the text independently. Towards the end of the test she noted that the game had been fun. This was an unexpected finding, as the game does not feature many things that children are used to in modern games (e.g. many visual cues, sounds, or animations). It suggests that this kind of gaming experience could potentially work for children, but in its current state would not work without direct supervision and participation from an adult as well.

Those looking to develop games for museum spaces need to deal with a wide ranging target audience. A possible solution for varying ages could be to implement the selection of an age-range or difficulty at the start of the game. Our results indicate that age is not a factor in whether participants enjoyed the game, but content will need to be tailored to different age groups. In addition to age, differences in nationality are also a frequent occurrence. Museums generally provide their information material in different languages, and this needs to be considered for any game in a museum space as well; even in our small user test the use of only English text caused a problem. Any story-based game developed for general museum visitors (i.e. not only children) will therefore

need a minimum amount of content that is adapted and translated to accommodate these differences.

In regards to the original aim of this project – to develop a game that promotes a better understanding of the everyday cultural context of the artefacts on display – the test brought mixed results, with the same amount of people reporting that the game gave them new insights as there were people reporting it did not. A reason given by one of the more sceptical participants was that the game did not relate to the artefacts enough to think more about their use. Although the game draws clear connections to the artefacts on display, the point could be made that the information about them is not integral to the clues (i.e. the information important to a player focused on solving the mystery) being collected. While the aim is to give an impression of the daily use of such an item, it is possible some players are more focused on getting the relevant information for their goal of finishing the game, therefore not spending more time thinking about the larger context. Future games could remedy this by putting the relevant artefacts themselves more at the centre of the story. The game may have worked as intended on those players that felt like they had gotten a better understanding of the Phoenicians from playing the game, however. Further testing and more in-depth interviews would be needed to explore how the game works for different players.

Factors that likely influenced how participants interacted with the game, were some of the testing limitations. Participants played the game after having finished their visit of the exhibit, rather than as a simultaneous activity. We consider it likely that this contributed to some participants being more focused on finishing the game rather than spending time thinking about the artefacts and the historical context of the mystery. In terms of data gathering, it is possible that participants were influenced by the presence of the game's developer and were less forthcoming in their answers than had the test been conducted by an external party. Although we considered direct observation of player behaviour by the game designer to be valuable at this stage in the project, it is possible participants were less critical of their experience or forthcoming in their answers. Further testing of such a game should ideally happen in closer collaboration with the museum in question and be performed by the museum staff or an external party.

Overall, the user tests confirmed that there is a demand for games in museum spaces, and show the potential universal appeal of roleplaying, narrative-based games in such spaces. Moving forward, we would consider alternatives to QR codes in any future iterations or projects. Although they functioned as intended, the use of Bluetooth beacons or similar technology would be less obtrusive in a museum space, and potentially be less difficult to interact with for older participants. It would allow for players to be notified of a clue automatically once they are in close proximity, rather than having to scan a code. This could help in keeping the player's focus on the exhibit and the larger context of the story, rather than finishing the game.

Additionally we foresee potential in the creation of authoring tools for museum staff. This type of game can easily be adapted to different exhibits by replacing the text and images. It would therefore be an inexpensive way of continuously delivering new content relevant to what is on display at a given time.

8 Conclusion

The aim of this study was to explore the possibility of narrative-based games to enhance visitors' museum experiences. Through narrative and role-playing elements, we attempted to provide visitors with a more complete picture of the people living in the past than out-of-context artefacts tend to provide. This was done by connecting objects on display to a story, in which the players take on the roles of historical figures as they try to solve a mystery.

The process of developing this game brought to light some of the challenges in designing games for museum spaces, for instance the importance of tailoring content to visitors of different ages and backgrounds. It also showed how simulated testing, while essential to the development process, does not always provide the same results as testing within the actual museum space. It is therefore essential that games developed for museums are done so in close collaboration with the museum involved and are extensively tested in the intended environment. Targeted research in how museum spaces affect player behaviour could prove very beneficial in these efforts.

The results of our tests suggest that there is a demand for interactive and game-like experiences within museum spaces. While such experiences can be found in museums all over the world, their implementation is far from being ubiquitous and participants in our study were still surprised about the concept of playing in a museum. Our user tests further suggest specific potential for narrative and roleplaying elements to contextualize heritage exhibits, and to engage a range of visitors, with half of the participants indicating that playing the game deepened their understanding of the Phoenician people.

The further back in time one goes, the less is often known about a culture. With only physical artefacts remaining and little representations of people (e.g. through statues or paintings), a game like *Heritage Hunt* can help visitors relate to the people of ancient civilizations and gain an understanding that is difficult to conceive from artefacts alone. This paper takes the first steps towards introducing roleplaying mechanics to museum spaces in the hope that others will follow in the footsteps towards combining innovation and games in heritage museums.

Acknowledgements

We would like to thank the participants in this study for their time, as well as the staff of the National Museum of Archaeology of Malta for their support.

References

1. American Museum of Natural History: MicroRangers (2015), `http://www.amnh.org/learn-teach/families/microrangers/`, [Online; accessed 16-March-2017]
2. Bennett, T.: The Birth of the Museum: History, Theory, Politics. Routledge, London (1995)
3. Bernhaupt, R.: User Experience Evaluation in Entertainment. In: Evaluating User Experience in Games, pp. 3–7. Springer (2010)
4. Bowman, S.L.: The Functions of Role-Playing Games: How Participants Create Community, Solve Problems and Explore Identity. McFarland (2010)

5. Daniau, S.: The Transformative Potential of Role-Playing Games: From Play Skills to Human Skills. Simulation & Gaming 47(4), 423–444 (2016)
6. Falk, J.H., Dierking, L.D.: Learning From Museums: Visitor Experiences and the Making of Meaning. Altamira Press (2000)
7. Ferreira, B.: How Games Are Changing the Museum Experience (2016), http://motherboard.vice.com/en_us/article/yp3wwj/how-games-are-changing-the-museum-experience, [Online; accessed 16-March-2017]
8. Kelly, L., Groundwater-Smith, S.: Revisioning the Physical and On-line Museum: A Partnership With the Coalition of Knowledge Building Schools. Journal of Museum Education 34(1), 55–68 (2009)
9. Marty, P.F., Jones, K.B.: Museum Informatics: People, Information, and Technology in Museums. Routledge, London (2012)
10. Mortara, M., Catalano, C.E., Bellotti, F., Fiucci, G., Houry-Panchetti, M., Petridis, P.: Learning cultural heritage by serious games. Journal of Cultural Heritage 15(3), 318–325 (2014)
11. Ravelli, L.: Museum Texts: Communication Frameworks. Routledge, London (2006)
12. Smithsonian Institution: Results of the 2004 Smithsonian-wide Survey of Museum Visitors (2004), http://www.si.edu/content/opanda/docs/rpts2004/04.10.visitors2004.final.pdf, [Online; accessed 15-March-2017]
13. Takatalo, J., Häkkinen, J., Kaistinen, J., Nyman, G.: Presence, Involvement, and Flow in Digital Games. In: Evaluating User Experience in Games, pp. 23–46. Springer (2010)
14. Witcomb, A.: Re-imagining the Museum: Beyond the Mausoleum. Psychology Press, London (2003)