

Minoans. The Application of Games, Immersive Environments and Role-Playing in Cultural Heritage

CRISTIANA BARANDONI, University of Florence, Italy

In this paper I present the opportunity to use game-based activities and gamification in the field of Minoan Archaeology. I examine a possible way that students (or general public) can approach ancient past, thanks to informal learning, based on principles of gamification. These values can be leveraged to attract interest and develop awareness about Cretan heritage. In particular I focus on the implications of gamification to teach archaeology in both Primary and Secondary schools and talk about the potential of using games to integrate educational activities for digital or virtual museums. Finally, I discuss the importance of users - whose identity cannot be defined, if not roughly - and the achievement of an ever wider public, which require Museums to find forms of communication that combine general needs, including education, entertainment, happiness with effective identity actions. A possible response could be provided by those tools that, on the one hand, guarantee simple, easy to understand and decipherable communication methods, and on the other allow the transformation of technological complexity into opportunities of knowledge, in response to the increasingly digital nature of scholarship and intellectual culture. I'll try to demonstrate thanks to the experiment *Minoans* how archaeology in and off museums may profit from games and gamification.

Key words:

Game, Gamification, Aegean Civilizations, School, Educational.

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INTRODUCTION

In recent years the relationship between public and museums has literally changed the way museums should be "used". More and more often traditional instruments such as audio guides or guided tours have been replaced by the so-called experience, a theoretical *modus operandi* that is not identified yet, due to its heterogeneity; alongside we see the growth of offering informal learning activities the large part of, is game based [Pierroux et al. 2007]. The practice of gamification is assuming a fundamental role in communication strategies which have cultural heritage as the main topic: adult guided tours, for example, have turned into emotional storytelling experiences as well as children tours have been converted into fairy walking storytelling [Hoffman et al. 2005]. Given the increasingly rapid and catchy expansion of new communication approaches, which rises as demand for new touchy experience develops, users are asked to actively contribute to flank museum experience, stopping passive attitude but becoming cultural content producers: what we identify as prosumers, key players for the museum of the future [Fois 2015].

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Author's address: Cristiana Barandoni, Scuola di Specializzazione in Beni archeologici, University of Florence, Italy; email: cristiana.barandoni@gmail.com

Given these facts, prosumers become the symbol of what is currently transforming the relationship between the public and the museum. General public, who until recently was satisfied with more or less established timing and standardized guided itineraries, has changed radically in the last decade, becoming not only beneficiary but a promoter of cultural experience. After a visit, what remains is the feeling to be beneficial for other people's experience and that's the reason why we constantly gratify the need to "share" on social media. Over time, digital has proved to be the ideal tool to establish relationship between user and object, a device which can rely on augmented reality to produce immersive experience, that greatly contribute to make users protagonists. The connection between virtual and physical world produces in turn new contents which, thanks to sharing, end up becoming promotional museums activities themselves [Van Dijck 2010]. To enhance the experience of the visit, several museums adopt worksheets or activity leaflets whose positive effects are undergoing statistical analysis. In this setting, can we establish how and why we'd use game or game-based activities? Can gamification both engage and support inquiry across school and museum contexts [Wishart and Triggs 2010]?

Augmented Reality [Kounavis et al. 2012; Hammady et al. 2016] and mobile games are more and more employed to "stay on task" [DeWitt and Storksdieck 2008] especially during temporary exhibitions, no matter what the main subject may be. In this paper I highlight the importance of using a board game for teaching archaeology at school (primary and secondary). I've been working for several museums as expert in teaching and developing new activities based on up-to-date approaches to archaeology, both physically (workshop with clay handling) and digitally (hypertexts): thanks to this decennary experience I understood the importance of engaging students stimulating their interest but above all making them feel good and amused practicing activities related to history learning. A board game, that can be used both on/off line, could satisfy the need for learning and the will to feel at ease with archeology, converged in the same tool. It's evident that digital experiences, adjusted for the age and degree of interaction, have become over time a fundamental tool for inclusion not to be neither discriminatory nor dogmatic, but able to reach wider audiences ever and ever. Digital communication can break down boundary amid knowledge and awareness of content, overcoming educational gaps with tools that can convey specific contents, going beyond traditional methods of communication. To prove the importance of a *learning in action* approach – that the game Minoans could easily provide – I want to underline the difference between "common" unilateral approach and the potential of substituting it with a game-based activity. Audio guides (unilateral approach) are structured in a standard format: several selected data are given to users, just as regular and fixed is the tour they suggest; the exchange with the work of art can only be one-way. On the contrary, if visitors use digital media, they can address the work of art according to their needs, knowledge, interests but above all curiosity to satisfy. This allows a sort of straight relationship with art and archeology, tailored and not buffering. If we add to all this the ability to have fun doing it, the association between people and museums may become special and direct, almost "sentimental". Digital media offer the chance to feel free of going improving knowledge with no need to be physically in front of a painting or a statue to know everything about it because the medium can be used far from the place where items are on display: this unlocks the relationship user/location, leaving the first free to wander without the need to pay constantly attention [Marti et al. 1999]. Serious and board games can be used everywhere, both in or outside a specific place giving the change to players to take their time to play.

The solution I present here, Minoans, is quite a good attempt to turn learning into happiness to learn. There is no special need if the game is played home or at school, if instead the activity takes place in museum, some precautions should be taken. Museums should be equipped with devices with high definition standards, given the need of excellent images, perfectly representing the originals (Fig. 1); in this case it would be possible to use a touchscreen where the game is uploaded and proceeding box by box until the game is completed; to do this is necessary the planning of a suitable mass-media communication method. According to a digital communication policy based on these assumptions it is possible to establish a preferential relationship and an emotional recognition with what is exposed: the object on a side, the game to learn on the other. It is ascertained that the introduction of an effective digital instrument could find an ideal humus also in museography approach, through which interactivity can substantially accomplish its task by placing itself as a dialogic medium and not as a partition concerning context, objects and user.



Fig. 1. Touch screen in museum¹.

MUSEUMS DOING DIGITAL VS MUSEUMS DOING GOOD?

Some archaeological museums have refused the virtual chance (estimating it too audacious because it seems unsuitable or too far from the traditional way of perceiving ancient past). This might be because the nineteenth-century museography tradition is still conceptually substantial to be abandoned in toto. On the other hand, the need to consider the potential of these new tools leads in rethinking of the role of the users who, aware of their function, requires a more energetic consideration from the institution to feel integrated. A museum that does not include digital updating will not support the creation of knowledge networks that are impossible to wave with traditional outfits. If this is a complex question to solve, I overstate the situation offering a game, *Minoans*, as a potential solution, assuming that “gamify something so traditional as visiting a museum is to turn it into a unique experience, fun above all, and also motivating for all age groups, differentiating the experience of just looking at the exhibits in a museum experience to interact with them, through a narrative, following the exposure of the rules, analyzing in an immersive and interactive way what there is to see inside the museum” [Llorens-Largo et al. 2016].

Brainstorming about how, when, and above all **why** we should create a game to teach Minoan archaeology, I observed several experiences of games in museums [Robson et al. 2015; Ian McCarthy et al. 2014; Tzima et al. 2018]. My research provided us some interesting points from which to begin working to make a game. First, I studied the impact of games on young people, during educational activities (specifically at school) [Wishart and Triggs 2010; Crowe and Flynn 2015; Tobail et al. 2011]; then investigated their responses when facing difficulties (are games useful for learning or only for leisure? Is a game to be considered only on its relaxation side or even for educational intentions?). Our examinations and our experience with the game *Minoans* is too young to be determinant but we may already synthesize that learning from unconventional media is a tangible challenge [Burden and Maher 2015]. The moments we’re undergoing an experimentation, so the response is maybe too informal to be definitive but if we work and make a good game, children are seriously interested in it and this doesn’t mean that they mustn’t have fun during learning [Yee 2007]. It’s undeniable that many “educational” games are didactic first and entertaining second but thanks to interactivity, if correctly planned, a strong process of schooling can be hypothesized, especially at school, under the supervision and the

¹ Picture/credits: <https://www.digitalmeetsculture.net/article/mobile-digital-museum-the-frontier-for-cultural-heritage-exhibitions/> (verified Jan 31, 2018)

collaboration of teachers [Blackberry and Woods 2015]. This is the circumstance around which gamification or game-based activities, when are used to enhance archaeological and/or artistic heritage knowledge, permit to strengthen values of culture, identity and civilization. Working on Minoans² has led to reflect on which role assign to games in educational context; for example:

- Are we sure we want to use gamification for museum/archaeological contents?

Very popular abroad but much less in Italy, games are enjoying great success in museums. I want to cite an example: *Father and Son*³, the first videogame produced by an Italian museum, the National Archaeological Museum of Naples. The game is downloadable for free and usable on tablet, smartphones, available both for iOS and Android platforms. Eighteen months after the launch (March 2017) has exceeded one million downloads⁴. This means that if a single game can succeed in attracting such a large number of people (more than fifteen thousand people have gone to the museum to get extra content), the spread of gamification as a practice at the service of the museums is a path that it is worth trying (though also the success in school is already proof of its effectiveness for knowledge purpose [YanFi et al. 2017]).

- Are we sure *is it all a game?*

Gamification is an emerging trend in business or management [Ayoung et al. 2017], health [King et al. 2013; Alahäivälä and Oinas-Kukkonen 2016] and education contexts [Boyle et al. 2016]. When we talk about gamification we refer to the “use of game-mechanics in non-gaming contexts”: again quoting the Neapolitan example, its videogame, available in several languages (including Chinese, Russian and, soon, the Neapolitan) uses this mechanics to tell the story of Michael, a young man who flies to Naples to solve the mystery of a letter left to him by his father, an archaeologist who worked in the museum. The graphic was hand-drawn by the artist Sean Wenham, who rebuilt about three kilometers of Neapolitan roads (as well as most of the museum's exhibition halls) based on hundreds of photos taken from historical archives. The dynamics of the plot invites the player to a journey through time, embracing different ages, from Roman times to Borbonic kingdom. Twelve thousand people decided to transform the game activity into a trip, going to the museum to unlock extra contents. Users, from having a completely abstract and digital experience, turned their experience into a physical journey while accessing higher levels, which obviously led to an upgrade in the knowledge of archaeological heritage and the city itself. This represents a concrete and feasible challenge if interpreted as a new expression (or practice) of the potential that cultural and touristic enhancement can encourage if well communicated.

- Are we sure we can influence behaviors if we use gamification at school?

Minoans is structured as a board game that can be used off/online to respond to schools' educational requests, increasingly focused on the use of digital tools, such as interactive whiteboard (IWB). These media allow fun and amusing approaches: if we can join entertainment to education, we'd be in the position of confirming gamification's capacity to enhance students' motivation and engagement. After all, gamification (and games in general) is very helpful if we want to improve motivation and increase engagement (specifically in the study of ancient past, a topic students are not very confident with. See Fig. 2). If games can push learner to be more flexible and autonomous on the other hands they encourage collective learning, and in case they'd be so productive, can give rise to communities of practice [Parsons and Taylor 2011]

² To know more about the project, please see [Barandoni et al. 2019]

³ <http://www.fatherandsongame.com/>

⁴ <https://play.google.com/store/apps/details?id=it.tuomuseo.fatherandson&hl=it>

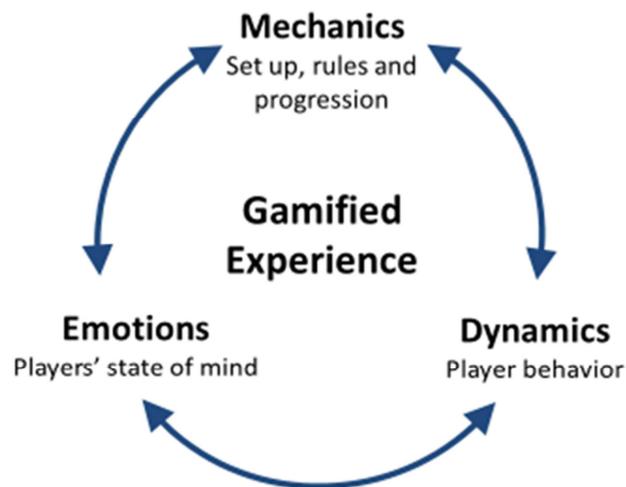


Fig. 2. MDE framework of gamification principles. [Robson et al. 2015]

MINOANS. THE WHYS AND THE HOWS

The museum establishment is therefore less static and much more creative than once supposed, and attempts, with every virtual means, to erase, as far as possible, barriers not only architectural but conceptual. *Minoans*, starting from the experience of MUSINT I-II, focuses on that. Conceptually our board game is strictly organized following the display of systematic contents and adopt methods closely linked to goals. When gamed at school its purpose is to encourage students first to learn more about Aegean history in a funny way and then go and visit museums where these objects are on display; if used in non-strictly educational background to offer a gamified experience to promoting knowledge of Crete Island and its heritage. Since we needed to find what makes things fun to learn [Malone, 1980] we decided what kind of contents to give and when, using several activities as motivational premises so that players get easily and gradually engaged thank to a board conceived on game design thinking. Curiosity, fantasy and at least challenge are the premises for building an engaging practice, playable both at school or individually; gamers are pushed to proceed thanks to gamification efforts to enable winning experiences whose aim is to reach Knossos and kill the Minotaur (i.e. the problem to be solved). From a psychological standpoint, engagement in an experience comprises the energy, involvement, and efficacy felt by the individual in the experience [Maslach and Leiter 1997]. To motivate players frequently, we decided to arrange quizzes and amazing activities alternatively: once they solve a word search, for example, they can go further on the path, otherwise they are obliged to pay a penalty. Once *Minoans* will be totally virtual, players will have access to supplementary contents such as collections that are not always on display, hidden artefacts with hundreds of stories to tell. Those items represent the reward players need to pass from a lower level at a higher one: their progress won't correspond in obtaining scores [as you may expect] but with the chance to get more contents to watch (such as videos or 3D reconstructions) where they can learn more about ancient Crete. Thanks to these "prizes" they will be able to read the solutions to the trials disseminated along the path ward them. *Minoans* doesn't include a score that goes up as players complete each task: they simply game to advance in the story and complete their mission. The story we created is certainly very modest but it's what players need to focus on archaeology and scientific contents, rather than creating a very complex plot that may cause their neglect. Strengthening the relationship between content's quality and outcomes, we'd be able to influence learning through a mediating process along with the guarantee of a rigorous, scientific study of gamification process [Landers 2015]. Aesthetics may also help interactive process, so we decided to

reproduce an old-fashioned map⁵ like the pirate's ones (Fig. 3): in our opinion this is eye-pleasing to draw attention and maintain full immersion and engagement, following step-by-step gamification principles⁶.

The use of serious games to support cultural heritage purposes is not receiving the proper attention in research, although an increasing number of scholars are focusing on this [Bellotti et al., 2013; Mortara et al., 2014]. Our mission is to get cultural institutions aware of the potential of the use of digital resources to play games: therefore, Minoans could be an exportable prototype to investigate the usage of serious games for cultural issues. We developed the off/online serious game that immerses player into Aegean archaeology and helps people (especially students) learn about this ancient civilization. Its lively approach not only increases motivation to acquire competencies about Aegean archaeology but also raises interest in art history and cultural heritage in general. What we tried to consider, during the planning, is people's competitive attitude and the desire to master new skills and concepts. Therefore, every choice has been made, taking into consideration:

- Structure/Counting/Reading (I've been inspired by very simple games such as snakes and ladders; cognitive and mathematical approach/ learn by passing trials)
- Knowledge: archaeology
- Visual perception: the board game is a clear reminiscence of fairy tales about pirates

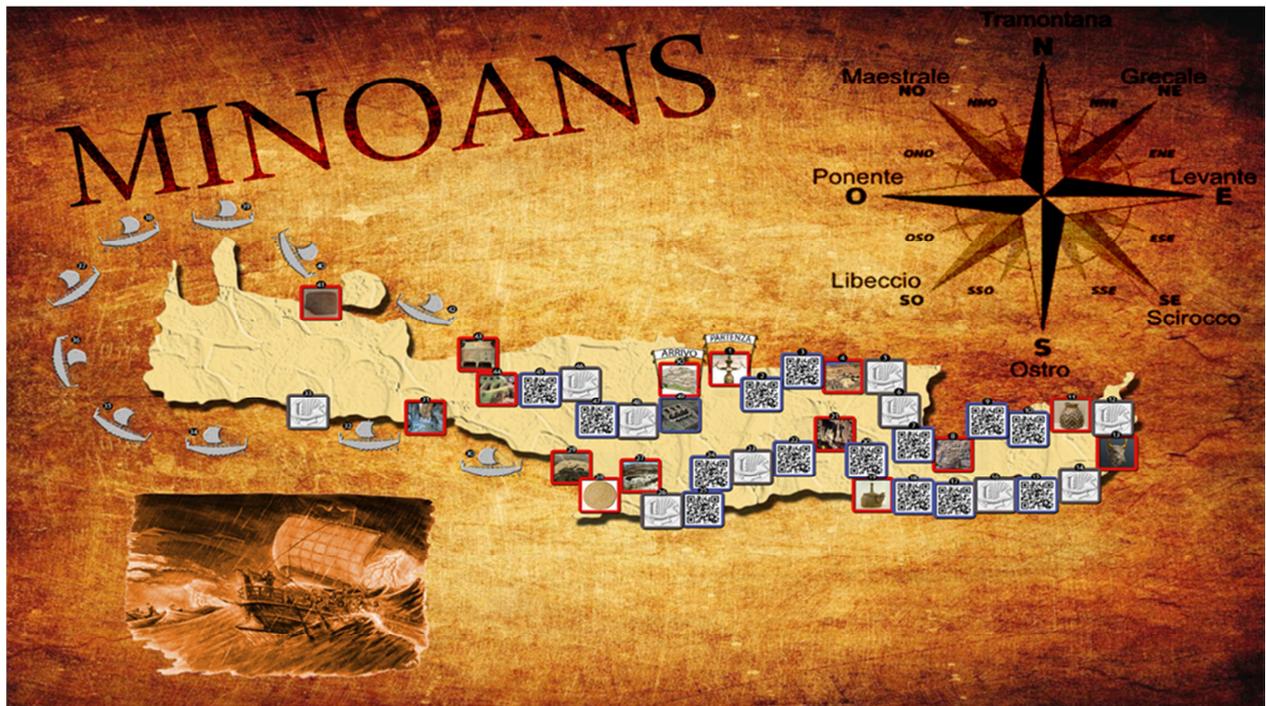


Fig. 3. Minoans board game. Graphic project and layout: Cristiana Barandoni

Overcoming the architectural bounds (MUSINT I-II) goes hand in hand with the social one: distributing cultural content by designing appropriate tools is, in fact, the greatest contemporary challenge, a test that cannot be exhausted by the creation of an internet site but must also draw those tools that can fill gaps, abolish distances, organize knowledge, consider the teaching aspect as legitimate as the playful ones [Barandoni 2016; Hammady et al. 2016]. It follows that Minoans nevertheless must bear in mind the ability to access and stay on the web (once it will entirely online); the chosen content will have to be

⁵ Minoans has the shape of Crete Island, the coasts being transformed into 50 boxes; three different kinds of boxes/squares are set: blue, grey and red; 10 out of 50 are boats.

⁶ datagame.io/gamification-principles/

calibrated, based on the purpose of the game, which always has the ultimate determination of bridging contemporary players to Aegean archaeology.

The University of Florence⁷ with its fundamental research contribution has provided the basis for incorporating and structuring pertinent contents from MUSINT: in this way heritage education can benefit from the method not just from exposure. The inherent polymorphism of the new digital approach makes the dialogue more ductile, avoiding the risk of depriving content. In the search for new tools and methodology it is credible to draw on the game to elaborate new syntax of knowledge. We freed the object represented in Minoans from being a totem of the past in support of a new, but unusual, strategy of knowledge: play game to enjoy. In this study, I dealt with a common problem, the old intellectual way of thinking to talk to public about archaeology; it's a complex discipline, not very easy to unravel to nonprofessionals, that's why I tried to modernize this way of thinking adopting a different solution, a board game, whose effectiveness, in future thanks to new coming occasions to try it, could reach the importance of Father and Son. The next step in the developing of Minoans is giving it 2D side-scrolling narrative structure. In this way it will be playable everywhere in the world, attracting an increasingly wider and more diversified audience. Gamers will experiment directly a sort of evolution over time, thanks to new stories and new objects and related games activities offered.

CONCLUSIONS

*Good games and play are fun. It's what sets them apart from work⁸ : if games are enjoyable, learning having fun should be the ideal way to achieve knowledge. Playing game could be interpreted as a challenging opportunity to offer new methods of talking about archaeology for all the facilitators (teachers, tour guides, museum professionals). Our cultural world is undergoing strong and effective changes, so do professionals, who need to familiarize to these changes. This means that we all are engaged in finding out new ways of raising the interest of different publics, especially children and young adults in cultural heritage because everyone is next in line to carry out high-quality preservation efforts. Serious games have been proven to be a source of enjoyment and, if well-made, are a powerful tool to help museums entertain and enlarge cultural offers. *Playing games is an easy and excellent way to spend unhurried, enjoyable, (for us) training time together. As do board games extremely rich in learning opportunities⁹ .**

At the time of writing this essay we tested *Minoans* only few times and we're not in the position of ascertaining its use as valuable or not; however, I'm not new to produce game-based activities¹⁰ and I'm sure that in the next experimentations, analytics will give us the chance to take stock of the situation. Our former experiences reveal a great interest of public (not only students) to take part to gamified experiences, of which *Minoans* is the result, even though not yet explored totally. To design a gamified experience for virtual museums means to consider educational and scientific contents production first. Game is not less important but an explicit chance to profit from, a chance museum should offer to their visitors. In this article, I have shown that gamification is a challenge cultural sectors should rely on to turn a simple guided tour into an experience: this is not only a revolution in the concept of how we should "use" museums but how behaviors change [Loh and Sheng 2015] if accomplished by applying lessons from game design to non-game settings [Robson et al. 2016].

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⁷ I want to thank Professor Margherita Jasink, SAGAS (Dipartimento di Storia, Archeologia, Geografia, Arte, Spettacolo, University of Florence) who accepted my proposal of this game and without whose fundamental contribution this project would have never been made.

⁸ <http://themuseumofthefuture.com/2015/04/11/games-gamification-and-the-optimal-conditions-for-learning/>

⁹ <http://www.scholastic.com/parents/resources/article/creativity-play/benefits-board-games>

¹⁰ <http://www.aegean-museum.it/musint2/it/educational/learn.php>

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