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THE GAMIFICATION OF LEARNING CULTURAL HERITAGE: ARCHITECTING A SCENARIO

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Abstract

Gamification has gained a growing interest in the tourism literature and it has pervaded many applications in the tourism industry including museums. The main purpose of this research is to use the concept of gamification as a tool to enhance visitors' attraction. This research paper examines the concepts of heritage and gamification first and then, highlights the role of gamification and museums in preserving and educating the cultural heritage. In order to create a gamified learning experience of the cultural heritage, this paper attempt to develop a scenario of a puzzle game for the Eti Archaeological Museum (EAM) using scenario analysis as a qualitative methodology. For this purpose, the required information was collected by visits held in the museum. Furthermore, to facilitate the creation of the story of the respective game the scenario was developed in a strategic and systematic way. Finally, we propose a novel way to enhance the visitors' experience, potential visitors' attraction and their learning experience by suggesting the application of the puzzle game in the EAM through the context of the developed scenario. In addition to this, suggestions are given for further studies.

Keywords: Gamification, cultural heritage, museum, scenario

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1. Introduction

1.1. Heritage and Cultural Heritage

The word Heritage, which is defined as valued objects and qualities such as historic buildings and cultural traditions that have been passed down from previous generations (Oxford Dictionaries) briefly means, what we as human inherit from the past and use in the present (Graham, Ashworth, & Tunbridge, 2000). The definition of heritage in its broader meaning is generally associated with the

word inheritance; that is, something transferred from one generation to another. Owing to its role as a carrier of historical values from the past, heritage is viewed as part of the cultural tradition of a society (Nuryanti, 1996). It may be tangible (e.g monuments, building, coal mines, railway stations, artwork or museum pieces) or it may be intangible (e.g beliefs, flavours, sounds, activities or social relation) (Timothy, 2014a; 2014b).

1.2. Learning of Heritage and Gamification

Gamification in learning and education is a set of activities and processes To solve problems related to learning and education by using or applying the game mechanics (Kim, Song, Lockee, & Burton, 2018). Games for educational purposes namely Serious Games (SGs) are now becoming more and more popular (Michela, et al., 2013). The main feature of an SG is its objective of supporting the player to achieve learning targets through a fun experience (Capdevila, Marne, & Labat, 2011). Recently we have witnessed the introduction of serious games, including the use of games to support cultural heritage purposes, such as historical teaching and learning, or for enhancing museum visits (Apperley, 2006). The majority of architectural/natural heritage awareness games either offer an immersive, realistic reconstruction of a reallocation to appreciate and learn the architectural, artistic or natural values of a site, or simply offer engaging mechanisms to motivate users into areal experience (Bellotti, Berta, De Gloria, D'Ursi, & Fiore, 2012).

1.3. Museums and Heritage and the Role of Museums in Learning

Museums, like most heritage attractions, are multi-functional facilities whose mandates commonly comprise a variety of goals (Ashworth, 2012; Tunbridge, 2007) and have been widely considered as being informal educational sites and have been greatly acknowledged for their ability to stimulate the development of interest, enthusiasm, motivation, eagerness to learn, cultural awareness, and general openness and alertness (Briseño-Garzón, 2013; Dierking & Falk, 1994). Heritage includes but extends beyond tangible bricks and mortar to encompass the practices, representations, expressions, as well as the knowledge and skills (including instruments, objects, artifacts, cultural spaces), that communities, groups and, in some cases, individuals recognize as part of their cultural heritage (UNESCO, 2003). As part of the process of safeguarding heritage, museums are commonly perceived to be important means of presenting, preserving and protecting heritage (Kurin, 2004). In recent years, museums, have been promoted as leisure based learning centres. People around the world are using their leisure time to visit museum collections and gaining meaningful experiences by enjoying museum spaces (Roberson, 2011). Many experts think that museums will play an increasingly valuable role in education as our economy transforms into a knowledge-based economy (Packer & Ballantyne, 2002).

1.4. Eskişehir and The Eti Archaeological Museum

Eskişehir is very important in the Ottoman history as its Karacahisar Castle is the first conquest of the Ottomans. Almost all of Eskişehir's counties are settlements which are rich in history and culture. Among these is Mihalıççık where Yunus Emre, the pioneer of Turkish poetry, a minstrel and philosopher was born and the Yunus Emre Social Complex can be found here today. Sivrihisar, a significant settlement during the Roman and Byzantine periods, is famous for artworks dating from the time of the Seljuk and Ottoman empires. Besides Akşehir in Konya, Sivrihisar is also believed to be the birthplace of Nasreddin Hodja, a world-famous philosopher. The county of Seyitgazi is well-known for the tomb of Seyyid Battal Gazi, a saintly figure and warrior. Located in central Eskişehir is Odunpazarı, the area where the first city is thought to have been established (HomeTurkey).

In 1945, a storage museum was established in Eskişehir Alaeddin Mosque with movable cultural assets collected from the provinces and counties of Eskişehir. In 1966, Kurşunlu Mosque Complex located in

Odunpazarı District was officially opened to service by Eskişehir Museum Directorate. By the Ministry of Culture and Tourism, ETI Eskisehir Archaeological Museum, to display the projects implemented by the private sector in Turkey is considered as the first museum. The densities of the museum exhibits are as follows: Dorylaion (Şarhöyük Eskişehir-Tepebaşı), Pessinus (Sivrihisar-Ballıhisar), Han Yeraltı City (Han Yazılıkaya), Keçiçayırı (Seyitgazi-Bardakçı), Çavlum Village Old Hittite Necropolis (Odunpazarı-Çavlum), Demircihöyük Tepebaşı), Karacahisar (Odunpazarı-Karacaşehir) Küllüoba (Seyitgazi-Yenikent), are exhibited in chronological order together with their important finds. Among the exhibited works are marble sculptures and statuettes, architectural pieces, stellar, terracotta daily use vessels, idols, glass vessels and beads, metal vessels and weapons, jewellery, coins. There are approximately 22,500 movable cultural assets in the Eskişehir ETİ Archaeology Museum covering Neolithic, Chalcolithic, Bronze, Hittite, Phrygian, Hellenistic, Roman, Byzantine, Seljuk and Ottoman periods. The remaining 20,500 artefacts are preserved in 900 m2 museum repositories, except for approximately 2,000 artefacts exhibited in a covered area of approximately 1,800 square meters of the museum (Republic of Turkey Ministry of Culture and Tourism).

The main purpose of this study is to enhance the attraction of Eti Archaeological Museum' visitors as well as, their awareness of the cultural heritage of Eskişehir. Therefore, Gamification can bring a new innovative way for realizing the purpose of this study. In order to develop a gamified learning experience of the cultural heritage of Eskişehir and thus, enhancing visitor attraction, this study is working on architecting a scenario for a puzzle game.

2. Literature Review

2.1. Heritage in Museums

Musealization of the object allows more effective solving one of the most important tasks for any of the World Heritage Sites popularization. Traditionally, one of the fundamental functions of the Museum is to popularize objects and collections, which it keeps (UNSECO, 2015). According to the official definition of the term Museum which is given in the ICOM Statutes: "A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment" (ICOM, 2017).

The Museum is one of the expert organizations for the conservation of cultural heritage and often museum becomes an unofficial centre for the preservation of cultural and natural heritage. Considering the great experience and potential of the museums preserving World Heritage objects, they could become methodical centres in the field of conservation, restoration and preservation of heritage in their region (UNSECO, 2015). The role of private museums in the preservation and interpretation of cultural heritage, in the processes of social adaptation and cultural identity, in education and leisure activities, is also rising (Absalyamova, Absalyamov, & Absalyamova, 2015).

Heritage resources are associated with memory. They mediate the past, present and future and can be used to shape collective memory into official versions of the past. Natural and cultural landscapes, specific sites, aspects of the built environment, monuments and material in museums can all trigger and shape individual memories as they are related to personal experiences. However, they also play a powerful role in shaping collective memories in terms of what is selected for preservation and storage, and how these resources are interpreted and presented (Davison, 2005).

Museums give material form to authorized versions of the past, which in time become institutionalized as public memory. In this way, museums anchor official memory. Every preserved artefact is a tangible trace, a crystallized memory, of its manufacture and use. Objects held by museums constitute a

material archive not only of preserved pasts but also the concerns that motivated museum practice over time. These concerns can seldom be separated from relations of power and cultural dominance. Museums have often been described as places of collective memory, but selective memory may be a more accurate description (Davison, 2005).

2.2. Gamificaiton

2.2.1. A Conceptual Framework

The term gamification first appeared in 2008 (Deterding, Dixon, Khaled, & Nacke, 2011) and has gained popularity since 2010 (Epstein, 2013). Gamification can be described as the integration of game mechanics into a non-game environment in order to give it a game-like feel (Deterding et al. 2011). In this context, gamification consists of four dimensions, namely, game, non-game context, elements and design (Yılmaz and Coşkun, 2016). According to Yılmaz and Coşkun (2016) these dimensions relates gamification to games, not to play, whereas play is contemplated as a category containing but different from games. Gamification refers to a process of enhancing a service with affordances for gameful experiences in order to support user's overall value creation (Huotari & Hamari, 2012). Zichermann and Cunningham (2011) suggest gamification to establish a brand, engage users and influence their behaviour by using game mechanics in areas other than traditional gaming context. According to Caillois (1961) gamification is still contested and many games and user experience designers have come up with other terms such as gamefulness and gameful design. Yet, it is important to distinguish between various terms that might be related or be named in the context of gamification. One of these is the distinction between playing (paidia) and gaming (ludus) as those represent two different types of activities. Playing involves free-form, non-rule-based and expressive actions, whereas gaming represents a rule-based and goal-oriented form of playing. Established research theories on games and gaming consistently confirm the previous definition as they characterise ludus through explicit rule systems and outcomes (Salen & Zimmermann 2004; Juul 2005).

With the goal of elaborating on the previous definition of the game concept (Matallaoui, Hanner, & Zarnekow, 2017), four fundamental features a game must have in order to fit in this classification of ludus and paidia (McGonigal, 2011):

- Clearly defined goals that provide players with a purpose for playing the game
- Consistently defined rules that represent the limitations and boundaries of how to achieve the given goals;
- A steady feedback system that guarantees the players that the goals can be reached if the game rules are respected;
- The free will of accepting participation in the game and thus following its rules to reach the goals

Seaborn and Fels (2015) argue that sometimes it is not easy to identify game elements. Therefore, it is inevitable to subjectively differentiate a fully fledged game and a gamified system which uses some game mechanics but not to create a whole game. Nevertheless, gamification differs with games for the purpose of play. Gamification focuses on changing players' behaviour, engagement with their environment and co-players who may also be fellow customers or service providers towards achieving meaningful interaction and engagement and potentially achieve rewards. In contrast, games focus more on entertainment and pleasure.

From a systematic point of view, the model MDA (Mechanics-Dynamics-Aesthetics) can be considered to explain the game design (Hunicke, Leblanc, & Zubek, 2004). Hunicke et al. (2004) define game mechanics as game tools which describe the specific components, which usually include achievements,

collections, badges etc. Game dynamics connect the player with the system, such as the freedom of making choices, progression to the next level, teamwork or competition with other players. Serious games include competitions against other players as part of the gaming experience whilst often concentrate on individual experience. Game dynamics work together to create a meaningful game experience, or in other words, aesthetics (Werbach & Hunter, 2012).

Motivation is a central topic in gamification as gamified systems are implemented to change behaviour for wanted and desirable activities. Motivation in gamification uses a two-folded approach. First, extrinsic motivation focuses on applying gamified elements into a non-gaming context to stimulate external motivation. Second, game thinking and motivational design have a positive influence on intrinsic motivation as it is done because of an internal desire to play (Groh, 2012; Nicholson, 2012; Ryan & Deci 2000).

2.2.2. Gamification in the Context of Tourism

Gamification is considered as a popular trend for tourism (WTM, 2011). Nevertheless, gamification as a consept, is not very novel for the tourism industry. In tourism, several applications are frequently used, more particularly by airlines, for example, earning miles in frequent flyer programs (Yılmaz and Coşkun, 2016). Chaffey and Ellis-Chadwick (2012) propose gamification as an important trend for marketing. In this regard, Yılmaz and Coşkun (2016) considers gamification as a new toy of marketing communicatin in tourism. Vargo and Lusch (2008) introduce the customer's role in value co-creation. Tourism experiences are co-created by both the tourists and the service providers (Neuhofer, Buhalis, & Ladkin, 2012). The level of consumer integration in the value creation depends on how tourism organisations empower tourists to play a role in new product development. Within service systems, tourists interact with tourism companies for the experience co-creation. Gamification can be applied in two ways in these systems. The concept can be used either to encourage customer engagement and enhance the experience or to improve employee engagement within an organisation (Huotari & Hamari, 2012).

The wide use of gamification is evidenced in education applications (Denny, 2013; Domínguez et al., 2013), health industry (Cafazzo, Casselman, Hamming, Katzman, & Palmert, 2012; Hori, Tokuda, Miura, Jiyama, & Jirose, 2013), business training and marketing campaign (Barata, Gama, Jorge, & Goncalves, 2013), sustainable behaviour applications (Gnauk, Dannecker, & Hahmann, 2012; Negruşa, Toader, Sofică, Tutunea, & Rus, 2015). However, gamification can be used by tourism organisations for marketing, sales and customer engagement (external application) or in human resources, training, productivity enhancement and crowdsourcing (internal application). Gamification can also benefit tourism marketing in raising brand awareness, enhancing tourist experience, engagement, improving customer loyalty, employee management and providing entertainment (Xu, Buhalis, & Weber, 2016).

2.2.3. Gamification in Museums

Gamification has been utilized and exploited in various domains of the including the museum sector (Sauer & Göbel, 2003). Museums, in fact, have abundantly used gamification as a way of teaching concepts, and revealing artefacts. as games often offer a suitable way of teaching concepts that would be otherwise hard to grasp. However, gamification is pervasively reaching all types of museum contexts, for its high potential in capturing attention and transferring information to visitors (Roccetti, Marfia, Varni, & Zanichelli, 2013).

2.2.4. Gamification in Learning

Gamification can be useful for learning and instruction because it can promote learner engagement. Due to its fun and playful nature, gamification can be a good solution to help solve learner engagement and participation issues. Considering the definition of gamification in learning and education described previously, serious games should be included in gamification in learning and education because they are also a set of activities and processes to solve problems related to learning and education by using or applying the game mechanics (Kim, et al., 2018).

3. Method

In this paper, scenario analysis (scenario development) has been utilized as a qualitative research methodology. However, there is a need to clarify the term scenario first. A scenario describes (textually or graphically) a set of hypothetical sequences of events that might reasonably take place (Kahn & Wiener, 1968). Scenarios can be considered as hypothetical images of the future that describe the functioning of a system under different conditions with a certain degree of uncertainty (Bunn & Salo, 1993). On the other hand, scenario analysis can be considered as complementary to traditional forecasting and simulation techniques, in which to provide a composite picture of future developments for use as a background for policy making and/or strategic planning. Scenario development or design can be considered for different layers of society in terms of demonstrating the change in the social structure as well as for consumers or managers. In this context, scenario analysis can contribute to important social issues such as education, health and security (Kozak, 2017).

In order to develop a game scenario that can serve the purpose of this paper, there is a need to create the story in a strategic and systematic way. Hence, this study benefits from the storytelling template for games that Kapp, Blair and Mesch presented. According to Kapp, Blair and Mesch (2014), creating a story outline should contain the following elements:

- Performance Objectives: Describing what will the user get after completing the experience
- The Situation: The situation should be described in order to set the direction of the story
- Characters: Who will be involved in the game?
- Goals: What will the users be trying to achieve?
- Metric: How the achievements of the users are going to be measured?
- Barriers and Conflicts: This shows what disrupt the character in achieving their goals.
- Control: What will the character be able to control and what can they merely react to?
- Chain: The order of the game or story.
- The predictable Unexpected: What would occur in the story that is predictable, but may be unexpected to the characters?

In the domain of cultural heritage, according to Mortara, et al. (2013), serious games falls in a wide variety of game genres, extend from trivia, puzzles and mini-games to engage in interactive exhibitions (e.g. History of a place, Multi-touch Rocks) to mobile applications for museum or touristic site visits motivated by some reward/engagement mechanism (e.g. Muse-US, Tidy City), to simulations of past events (The battle of Waterloo) to adventures and role-playing games set in faithful reconstructions or digital counterparts of real sites (e.g. the Priory Undercroft, Revolution).

Puzzle games can sometimes be a useful tool in educational purposes for the ability they provide to the players, like the use of logical skills, problem-solving skills, intuition, pattern recognition and memory to solve puzzles (Kim, et al. 2018, p. 20). Accordingly, this paper attempt to develop a scenario for a puzzle game in the light of storytelling elements given previously and the story will be given in an integration with the game elements in the following section in (Table, 1).

The required information to facilitate the creation of the scenario were collected by the writer in visits to the Eti Archaeological Museum, which took place in 17.04.2018 and 14.06.2018. Due to limited access to the full inventory of the museum, notes regarding the exhibited artefacts were taken manually.

4. Results

The puzzle game genre is a game type in which the player fits pieces of various shapes and colours together to complete the target image. In another word, this type of games work solving logic puzzles, or navigating mazes, or matching tiles. Puzzles are well suited to be played on mobile devices. Since the emergence of smartphones and tablets, new interaction methods, like swiping a screen by a finger, have been added to the typical means for playing these types of games. Because of the new interaction methods and new technologies, puzzle games have become more various and aesthetic (Mortara, et al. 2013; Kim, et al. 2018).

The scenario for the suggested game "Lands of Histories" which this paper worked on, is given below in detail:

Table 1. A Scenario for the Puzzle Game: Lands of Histories

Elements	Desctiption of the Story	Game Elements	Lierature
Performance Objectives	The performance objective of this game is to create a fun (gamified) learning experience of the cultural heritage that results in a rising visitor attraction.		
The situation	Players first will take a look pictures for a few seconds and then they will be asked to move or drag every piece of the puzzle to its desired location in the pictures related to their historical period (e.g. Picture of Çavlum Necropolis related to the Middle Bronze Age). Players should get the coins related to each period in order to pass to another.	Pattern recognition and collecting	Cunningham and Zichermann (2011); Deterding et al. (2011)
Characters	Players are whether visitors in-site (in the museum) or potential visitors off-site (out of the museum). Moreover, the game will be in two modes, single and multiplayer mode.	groups	Schell (2008); McGonigal (2011);
Goal	The player will be trying to complete every level of the game (periods of the history) and collect all the coins related to their levels in order to get achievements. By deploying QR codes in EAM, rewards are suggested to be given in two ways: (a) reward in case of	achievements, badges, rewards and gifting	Zichermann (2011); Deterding et al. (2011)

	accomplishing 50% of the game (e.g. a cup o coffee in a partner restaurant), (b) reward in case of completing the game with all the badges and the highest score (e.g. a one day free museum card).		
Metrics	The progressive bar will display the advancement of players for the whole game. Every part of the levels will be represented with one, two or three badges according to its difficulty. Additionally, Leaderboards will be deployed to demonstrate the best players, as well as players, will progressively get feedback about their performances.	progress bar, levels, badges, leaderboard and feedback	Schell (2008); McGonigal (2011); Zichermann (2011); Deterding et al. (2011)
Barriers and Conflicts	The main barrier is the time pressure. Players will be asked to complete the parts of the game under time pressure. This time will differ accordingly with the difficulties of the parts of each level of the game. The challenging situation between players.	Challenge, under time pressure	Werbach & Hunter, 2012
Control	Players will be free to choose by which level (historical period) to start and continue the game as well as, they can choose whether to play in a single or in the multiplayer mood. They will also be able to sign in to the game with their social media accounts and post their achievements.	Profiles	Schell (2008); McGonigal (2011);
"In Order To" Chain	To complete the game, players have to accomplish every specific level to get to another, and to accomplish every level players have to finish each part of that level of the game (e.g. finishing every picture of the Roman period and getting the coin, then passing to the Phrygian period, or vice versa).	Levels	Schell (2008); McGonigal (2011)
The Predictable Unexpected	Reinforcement will be available in the whole game but, players will have the right to get it merely 4 times throughout the game.	Reinforcement	Cunningham and Zichermann (2011); Deterding et al. (2011)

Source: Kapp, et al., (2014); Cunningham and Zichermann (2011); Deterding et al. (2011); Schell (2008); McGonigal (2011); Werbach & Hunter, 2012

5. Conclusion

This paper emphasis on the importance of gamification and the role of museums in learning cultural heritage. Moreover, this paper gives an example of architecting a scenario for a gamified learning experience of the cultural heritage in museums. The developed scenario in this paper will benefit the visitors by adding a fun factor to their experience in the Eti Archaeological Museum and, will be a useful tool for Destination Managment Organizations as well as, the administration of the EAM in bringing the chance to increase the attraction of potential visitors. Furthermore, this scenario can create new collaboration opportunities between EAM and other organizations such as cafes, restaurants and hotels that take place in Eskişehir. For the purpose of this paper, the developed scenario was created to fit the puzzle type of games. In further studies, more comprehensive scenarios and different type of games can be developed.

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