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A GAMIFICATION MODEL FOR COMMUNITY-BASED HERITAGE WORK: SELECTED BEST PRACTICES



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The project No. 2023-1-PT01-KA220-HED-000154261 "A gamification model for community-based heritage work" implemented within the framework of the Erasmus+ program



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Introduction

The transition to a fully democratic cultural citizenship in heritage safeguarding necessitates the active involvement of individuals, communities, cultural practitioners, and youth, particularly from academic institutions and heritage communities. According to the principles outlined in the Porto Santo Charter (PSC), heritage professionals must strive for a paradigm shift that acknowledges and respects the knowledge, traditions, and voices of all stakeholders. This approach does not seek to impose culture onto a territory; rather, it recognizes and elevates the existing local culture while integrating diverse cultural expressions.¹

Over the years, the role of communities in heritage work, both as individual citizens and collective actors, has repeatedly gained traction in both discussion circles and practical applications. The rapid emergence of new technological applications, combined with the social and cultural shifts occurring in post-pandemic Europe, and the attention garnered by innovative intervention techniques such as gamification strategies and serious games, provides a valuable opportunity to push the boundaries of the Cultural Heritage sector. A 2022 research study revealed that Europe and its higher education institutions remain central to these initiatives. However, the study also noted that heritage games often emerge as isolated, not replicable, one-time projects. There is considerable potential for developing more substantial networks and fostering collaborative work between authors and institutions. Such efforts would help to unify and strengthen the field, promoting the continuity and depth needed to fully leverage the potential of gamification in heritage work.²

¹ The Porto Santo Conference, a Portuguese Presidency of the Council of the European Union Initiative, *Porto Santo Charter, Culture and the Promotion of Democracy: Towards a European Cultural Citizenship* (Porto, 25th April, 2021): 6, <https://portosantocharter.eu/the-charter> (accessed July 15th, 2024).

² Célio Gonçalo Marques, João Paulo Pedro, Marta Dionísio, Paula Almeida, Cláudia Pires da Silva, “A Systematic Literature Review of Gamification in Cultural Heritage: Where are we? Where do we go?” *Journal of Tourism and Heritage Research* 5, n^o 4, (2022): 68-75.

This urgency and opportunity are especially relevant in low-density territories. As highlighted by the European Parliament Committee on Transport and Tourism, these areas face locational disadvantages that lead to low socio-economic development and historically receive less technological investment. Moreover, these regions often have significant employment in sectors that rely on cultural and natural landscapes and historical heritage, such as tourism and accommodation.³

Given these factors, the pertinence of the project "A Gamification Model for Community-Based Heritage Work" is greater than ever. This project seeks to actively shift the paradigm by leveraging local solutions and perspectives, fostering meaningful change through a network of European institutions and communities committed to this goal. By integrating gamification and serious games, the project aims to engage communities in heritage work more effectively, thus enhancing cultural citizenship and promoting sustainable development in low-density areas. A recent literature review on gamification in and for cultural heritage underscored these points, emphasizing the need to effectively engage the public, thereby deepening their understanding and appreciation of cultural heritage. By doing so, it encourages a more profound and sustained interaction with cultural heritage, bridging the gap between academic research and public engagement.⁴ This will be a crucial step until the more ambitious goals of establishing international embedded principles on digital heritage and enhancing structural collaboration between global organizations forums in this field are achieved.⁵

³ Romano Bisaschi et al, *Research for TRAN Committee – Transport infrastructure in low-density*

and depopulating areas (Brussels: European Parliament, Policy Department for Structural and Cohesion Policies, 2021), 15-20.

⁴ Célio Gonçalo Marques, João Paulo Pedro, Inês Araújo, „A Systematic Literature Review of Gamification in/for Cultural Heritage: Leveling up, Going Beyond,” *Heritage* 6 (2023), 5935–5951, <https://doi.org/10.3390/heritage6080312> (accessed January 24th, 2024).

⁵ Víctor Manuel López-Menchero Bendicho, Mariano Flores Gutiérrez, Matthew L. Vincent, Alfredo Grande León, „Digital Heritage and Virtual Archaeology: An Approach Through the Framework of International Recommendations”, in *Mixed Reality and Gamification for Cultural Heritage*, ed. Marinos Ioannides, Nadia Magnenat-Thalmann, George Papagiannakis (Geneva: Springer International Publishing, 2017), 3-28.

Titled “A Gamification Model for Community-Based Heritage Work” (No. 2023-1-PT01-KA220-HED-000154261), the project is implemented within the framework of the Erasmus+ program during 2023-2026. The partnership includes the Polytechnic University of Tomar (Portugal), D. A. Tsenov Academy of Economics (Bulgaria), Valahia University of Targoviste (Romania), University of South Bohemia in České Budějovice (Czech Republic), University of Trnava (Slovakia), University of Camerino (Italy), and Adana Science and Technology University (Türkiye).

One of the project’s Work Packages (WP) focuses on Best Practices. The primary objective of this WP is to identify and analyze best practices in using gamification for community-based cultural heritage work, including identification, safeguarding, and dissemination. To achieve this, each project partner from the seven participating countries identified and presented at least two examples of gamification in community-based heritage work. From these, two cases per partner were selected for in-depth analysis.

As a result, the booklet includes 14 case studies of best practices. The Work Package (WP) was coordinated by the D. A. Tsenov Academy of Economics and Valahia University of Targoviste. This booklet presents a broad outline of the conceptual framework for analysis, with a more comprehensive and detailed exposition available in a separate volume edited by the D. A. Tsenov Academy of Economics.⁶

The illustrations in this booklet consist of photographs taken by the authors of each case study and screenshots from the gamification initiatives.

⁶ Marusya Smokova, Célio Gonçalo Marques, João Tomaz Simões, Lígia Mateus, Silviu Miloiu, Sergiu Musteață, and Evelina Parashkevova, *A Guide to Identifying Best Practices for Gamification in Cultural Heritage* (Svishtov: Academic Publishing House "Tsenov," 2024).

Best Practices in Gamification for Community-Based Heritage Work: Key Insights

Conceptual Framework: An Overview

Best practice refers to a technique or method that, based on experience and research, has consistently demonstrated its effectiveness in achieving the desired results⁷. It is a standard or set of guidelines known to produce favorable outcomes when adhered to (WHO, 2017).⁸ Additionally, best practices are those that specific groups consider more effective in delivering particular outcomes compared to other methods, and thus, they serve as benchmarks to aspire to.⁹

In our project, we consider best practices as the knowledge of which gamification tools applied to cultural heritage work achieve desired results, create sustainable effects, and engage the target community. Identifying best practices involves judgment, requiring prior analysis using two types of criteria: impact and gamification.

Impact criteria are universal and general, applicable to assessing any type of case study or initiative. These criteria measure the degree to which an initiative generates or has the potential to create outcomes and effects in terms of performance, accessibility and inclusion, innovation and creativity, and social and cultural impact. When considering the impact criteria, we evaluate subcriteria such as performance (including effectiveness and sustainability), accessibility and inclusion, innovation

⁷ World Health Organization Regional Office for Africa, Brazzaville, *Guide for Documenting and Sharing "Best Practices" in Health Programmes* (Geneva: World Health Organization, 2008), 6-8.

⁸ World Health Organization Regional Office for Africa, Brazzaville, *A Guide to Identifying and Documenting Best Practices in Family Planning Programmes* (Geneva: World Health Organization, 2017), 6-7.

⁹ M. Andrews, „Document details - The logical limits of best practice administrative solutions in developing countries.“ *Public Administration and Development* 32, no. 2 (2012): 137-153.

and creativity (including originality and creativity), and social and cultural impact (including social development, enhancement of social culture, and multiplier effects).

Gamification criteria are specific to the field of study and provide representativeness from gamification strategies, heritage significance, and IT/technological perspectives. The criteria considered in our assessment were divided into intrinsic motivation heuristics, extrinsic heuristics, and context-dependent heuristics. Intrinsic motivation heuristics encompass several key components: purpose and meaning, challenge and competence, completeness and mastery, autonomy and creativity, relatedness, and immersion. Extrinsic motivation heuristics include ownership and rewards, scarcity, and loss avoidance. Context-dependent heuristics encompass feedback, unpredictability, and change and disruption.

An Introduction to the Assessment Methodology

All partners used the file 'Best Practice Identification Criteria.xlsx' to archive all identified projects, evaluate them, assess inter-rater reliability, calculate final scores, and rank the projects in descending order. The top two projects were defined as 'best practice' for each country. These identified best practices from the seven countries were used to prepare a synthesis report.

Each partner was responsible for collecting information on community-based gamification in cultural heritage projects implemented in their countries. All collected data were archived and coded. To minimize subjectivity and rater bias, each project was assigned to at least two independent raters. Raters evaluated the projects independently, entering their codes and ratings in the 'Gamification Criteria' (GC) and 'Impact Criteria' (IC) sheets. Rater codes followed the format Ryy, where yy was the rater's ID number. Raters used a 6-point scale (5 = very high, 4 = high, 3 = neither high nor low, 2 = low, 1 = very low, 0 = not applicable).

All evaluated projects were described in the 'Characterisation' sheet and sorted in descending order by their final project scores. The top two projects with the highest scores were titled as 'Best Practice' for each country.

Typology included tangible, intangible, and natural heritage.

Selected Case Studies

Building on the analyses outlined previously, this chapter will explore the 14 exemplary case studies detailed in the Best Practice Identification Criteria Excel file. These case studies represent the most effective practices identified through our evaluation process and will be examined to highlight their key features and insights.

BULGARIA

*Asen Bozhikov, Dimcho Shopov, Dimitar Kostov, Dragomir Iliev,
Elitsa Krasteva, Elitsa Petkova, Evelina Parashkevova,
Iskra Panteleeva, Lyubomira Todorova, Mariela Stoyanova,
Margarita Bogdanova, Tsvetan Pavlov, Valentina Ninova, Zhelyo Zhelev*

The team from D. A. Tsenov Academy of Economics evaluated 16 heritage gamifications reflecting the rich and diverse heritage of the country. Ultimately, they selected "Belogradchik Highlights: A High Wizard's Legacy" and "Roman Plovdiv - Urban Game" as best practices.

Belogradchik Highlights: A High Wizard's Legacy

The gamification features ten historical sites in Belogradchik, including the Fortress of Belogradchik, the Church of St. George the Victorious, and the Astronomical Observatory of Belogradchik, covering 2.9 km walking distance. It is a real-life city exploration gamification with the following objectives: visiting Belogradchik's most iconic locations, meeting Bulgarian war heroes from various historical periods, exploring Bulgaria's naïve and intuitive art scene, admiring the unique local Balkan architecture, and visiting a mosque from 1751 to hear its tale of tragic romance.



Illustration 1.1: Belogradchik Rocks and Fortress

Source: <https://questoapp.com/experiences/belogradchik-outdoor-escape-games/belogradchik-highlights-a-high-wizard-s-legacy>

The gamification meets the criteria for desirability by being developed in a low-density area and involving the community in its design, development, and aftermath. Available as an app on Questo for smartphones and tablets, the main rule is that every player must be physically present at the specified locations. Players with the highest scores are awarded medals on a leaderboard, specifically gold, silver, and bronze.

Link to the gamification:

<https://questoapp.com/experiences/belogradchik-outdoor-escape-games/belogradchik-a-high-wizard-s-legacy>

Roman Plovdiv - Urban Game

The gamification encompasses various tangible cultural and historic sites throughout the ancient city of Philippopolis (modern-day Plovdiv), which was the European Capital of Culture in 1999 and 2019¹⁰. It

¹⁰ European Capital of Culture, *Plovdiv 2019*, <https://plovdiv2019.eu/en> (accessed July 15th, 2024).

spans a distance of 2.5 km and takes approximately two hours to complete. Its primary goal is to promote the history and culture of Plovdiv.



Illustration 1.2: Theatrum Trimontense (Roman theatre of Philippopolis) of Plovdiv

Although not located in a low-density area, the gamification offers significant community involvement in its design, development, and aftermath. Technically, the gamification utilizes geolocation and QR codes and is designed for smartphones and tablets. To play the game, participants need a smartphone, tablet, pen, and paper.

Link to the gamification: <https://vutreshenglas.com/roman-plovdiv>.

CZECHIA

Vojtěch Blažek, Petra Karváňková, Jiří Rypal

The University of South Bohemia in České Budějovice selected two exemplary cases of good practices related to the local heritage of the Cold War/Iron Curtain: Grafenried-Lučina and Živé Hory. These cases reflect both tangible heritage (building remains and landscapes) and intangible heritage (stories and beliefs of displaced people). The two gamification initiatives are selected from low-density territories and fulfill the criteria for community engagement.

Grafenried-Lučina



Illustration 2.1: Grafenried-Lučina, a heritage village of displaced German Czechs.

The gamification is dedicated to commemorating the displaced German Czechs after World War II and restoring the village destroyed during the construction of the Iron Curtain. Community involvement is fostered through the development of cross-border cooperation, with unions of municipalities on both the Czech and German sides jointly advocating for the renewal of the municipality and the preservation of the shared memory. The technology used in the gamification includes Web platforms, YouTube videos, queesting, and storytelling.

Link to the gamification: <https://www.svazekdomazlicko.cz/projekty-1/grafenried-lucina/>

Živé Hory



Illustration 2.2: Živé Hory Heritage Gamification

As above, the main objective of the gamification is commemoration of displaced German Czechs after the Second World War and restoration of the remains of the vanished village and their

preservation. The technology of this gamification includes iOS + Android App, Web, and YouTube video.

Link to the gamification: <https://zivehory.cz/app/>

ITALY

Renato de Leone

Italy is one of the richest country globally in terms of heritage sites covering all human history from prehistory to 20th century. The Italian team evaluated six gamification initiatives reflecting on this rich history. In the end, two of them were selected as good practices, Father and Son 2

Naples: Father and Son 2



Illustration 3.1: Father and Son 2 Gamification.

Source:

<https://play.google.com/store/apps/details?id=com.TuoMuseo.FatherAndSon2&hl=en>

The National Archaeological Museum of Naples (Museo Archeologico Nazionale di Napoli), established in stages since the 18th century, boasts vast collections of Egyptian, Greek, and Roman artifacts, including those from Pompeii.

The gamification "Father and Son" (Editions 1 and 2) introduces a novel approach to storytelling, highlighting the museum's history and its collections. Player choices influence the gamification's final outcome, with

the narrative spanning various historical eras—from ancient Rome and Egypt, through the Bourbon era, to contemporary Naples.

Link to the gamification:

<https://play.google.com/store/apps/details?id=com.TuoMuseo.FatherAndSon2&pli=1>

Humbria²O in Gioco



Illustration 3.2: Humbria²O in Gioco Heritage Gamification

Source: <https://www.humbria2o.it/album/>

This gamification delves into the rich history of the region, offering an immersive card-collecting experience where players uncover the legendary Gods and Heroes of local lore. Supported by the Umbria Region which assures the community involvement, this educational project connects 8 municipalities and 14 museums, providing students aged 10-13 with a unique way to engage with their cultural heritage. As players journey through the myths and legends that shaped the region, they can collect and build their own deck of historical and mythical figures.

Link to the gamification: <https://www.humbria2o.it/album>

PORTUGAL

*Célio Gonçalo Marques, Inês Araújo, Lígia Mateus, Ânia Chasqueira,
Hélder Pestana, Inês Serrano, João Tomaz Simões*

The Portuguese team analyzed and compared ten gamification initiatives related to natural, tangible, and intangible heritage at local, regional, and national levels. Half of these initiatives were situated in low-density areas, with four involving community participation in the project design and nine in the project development and aftermath.

Lagoa Geotour



Illustration 4.1: Lagoa Geotour Gamification

Source: <https://lagoa-acoresh.pt/menu/descobrir-visitafazer/geotour>

Lagoa GeoTour is a collection of geocaches, placed on several points of interest of Lagoa municipality, at São Miguel, Azores archipelago. The tour was developed by a group of the scholar community of Lagoa High School in association with Lagoa Municipality and encompassed natural, tangible, and intangible heritage.

Lagoa GeoTour intends to immerse participants in the diverse contrasts of Lagoa territory: between past and future, sea and land, traditional and modern, allowing them to truly experience and feel Lagoa.

The community played a significant role in creating the geocaches, remains actively involved in their preservation, and some caches even depend on the community for their implementation. The project, designed for mobile devices, utilizes geolocation and QR codes for an interactive experience.

Link to the gamification initiative:

<https://www.geocaching.com/play/geotours/lagoa-azores>

Aldeia Pintada (Painted Village)



Illustration 4.2: Heritage Site in Aldeia Pintada, Torre, Batalha

‘Aldeia Pintada’ project is established in Torre village located at ‘centro region’, in Portugal mainland. The initiative is based on local

sayings and expressions, songs, stories, and village legends and tales and includes elements of tangible and intangible heritage. The main objective is to document and to record local heritage and use it as a stimulus for artistic creation and experience, as well as a tourist attraction that values local memory and identity.

The community is involved in the project, taking part in the process of creating the paintings and the project's interactive content. The project is constantly developing, with the creation of new paintings and new interactive content.

The initiative uses a digital map with geo-location, created on Google Maps, and QR codes, to guide visitors to key points of interest and showcase the artistic installations throughout the village.

Useful links to the gamification initiatives:

https://goo.gl/maps/GYbQznUBGtuhVZNu7?g_st=ac

<https://www.youtube.com/@olugarinhodatorre5688> and

<https://www.instagram.com/aldeiapintada/>

ROMANIA

Silviu Miloiu, Sergiu Musteață, Paul Bogdan Sălișteanu

In Romania, two gamification initiatives were recognized as good practices. The first is a village in Transylvania that impressively upholds its local, regional, and national heritage and boosts its identity. It is notably the birthplace of the renowned philosopher Emil Cioran, whose house is preserved intact and attracts visitors from around the world, adding international value to the village's cultural significance. The village is also the birthplace of a former prime minister and nationalist poet, attracting many visitors from across Romania. A local museum narrates the village's rich history. The village is also a significant gateway to numerous mountain trails that lead tourists to the Cindrel Mountains, with its highest peak reaching 2,244 meters.¹¹ The second one is related to local cultural heritage, and how it is affected by climate change, and is designed especially for high school teenagers.

Rasinari

The Questo gamification is focused on the Art, History, Culture, and Stories of the historic village of Rasinari. Its main objectives are to educate players about the historical and cultural significance of various memorial houses, historical churches, and art pieces; to raise awareness about the value of intangible heritage, such as traditional stories and folk traditions, and their role in preserving cultural identity.

¹¹ Raluca Iliuț, "Rășinari, trasee ale etno și ecoturismului," *Cibinium II* (2006-2008): 145-155.



Illustration 5.1: Rasinari Gamification, The memorial plaque to honor the memory of Emil Cioran

The gamification encourages players to engage in activities that simulate the preservation and conservation of historical sites and artifacts and highlight the importance of safeguarding intangible cultural heritage through in-game missions and storytelling. Ileana Carmen Damean, the gamification creator posted on Questo, is a mathematics and computer science teacher at Barcianu School in Rasinari. The gamification is for mobile devices able for iOS + Android App, Web, YouTube, and Storytelling. The game guides participants on a 1.8 km tour, which takes just under two hours to complete.

Link to the gamification: <https://questoapp.com/experiences/ra-inari-walking-tours/deschide-portile-spre-legende-rasinarene>

Climate Change



Illustration 5.2: Climate Change Gamification

This is an educational gamification for secondary-level students aged 13 to 18, which helps students discover their local cultural heritage, and how it is affected by climate change and engages them through the free Climate Heritage Game. The game encourages students to learn about their local heritage through short videos and interesting, fun questions. In the end, the gamification offers the opportunity to test acquired knowledge in challenging quizzes. So, in one way the game includes some local study cases, in another way it encourages students from various locations to learn about these places. At the same time, the game can be expanded by creating content and sharing the wonders of other historical locations. Thus, students in various localities are encouraged to contribute to the protection of endangered monuments by raising awareness.

The gamification is for computer and mobile devices with Internet access to the webpage.

Link to the gamification: <https://climateheritage.eu/>

SLOVAKIA

Lucia Nováková, Zuzana Danišková

The Slovakian team evaluated six gamification initiatives focused on local and regional heritage, with three of these located in low-density areas. Two initiatives demonstrated community involvement throughout the project design, development, and aftermath. The highest scores were achieved by the games *Golden Ticket Hunt* (90.95 out of 100) and *City QR Game in Handlová* (82.38%).

Golden Ticket Hunt



Illustration 6.1: Golden Ticket Hunt Game

The gamification draws inspiration from Roald Dahl’s literary heritage, focusing on the exploration of intangible heritage. Conceived by a group of enthusiasts from various cultural institutions around Panenská Street in Bratislava, the project is designed to celebrate the month of books in a unique and engaging way. By integrating elements from a beloved literary work, the game provides an original format that connects various stakeholders who also collaborate on other initiatives.

Participants are encouraged to engage actively by searching for hidden golden tickets in books and promotional materials at designated locations.

Accessible via mobile devices equipped with QR code readers, the game requires the installation of a dedicated application.

City QR Game in Handlová



Illustration 6.2: City QR Game in Handlová

The goal of the gamification is to explore the rich local history of Handlová, a town with medieval roots, encompassing both tangible and intangible heritage. Developed as part of the participatory budget project PARTI, the game involved significant contributions from the Children's Organization FÉNIX. This organization was one of five Slovak groups that received training on project development, with its young members actively participating in the game's creation. Designed for mobile devices, the gamification features a QR code reader and requires application installation for a fully interactive experience.

Link to the gamification:

<https://www.handlova.sk/novinka/84937/zabavte-sa-s-novou-mestskou-qr-hrou>

TÜRKIYE

Samet Oran, Muhammet Aktaş

Türkiye, a bridge between Europe and Asia, boasts a rich cultural heritage that makes it a prominent global tourist destination. The team at Adana Science and Technology University concentrated on gamification projects that reflect both Turkish and Iranian heritage, encompassing tangible and intangible aspects of local, national, and international significance. Three of the gamifications were implemented in low-density areas, with community involvement in the development and aftermath of two of them.

Antalya Alarhan

The gamification is designed to explore the local history of Antalya Alarhan, with a focus on its intangible heritage. It serves both educational and recreational purposes and is available for mobile devices with web access. It features interactive elements such as sound effects and illustrations, incorporates storytelling, and includes hidden clues within the narrative to enhance the learning experience.



Illustration 7.1: Antalya Alarhan Game

Link to the gamification: https://vaezafshar.com/Games/khan_game/

The Sericum Via a Serious Game for Preserving Tangible and Intangible Heritage of Iran

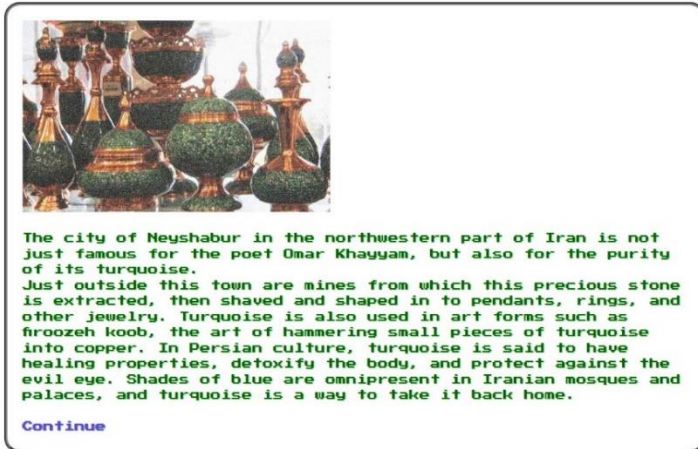


Illustration 7.2: The Sericum Via Game

The gamification centers on intangible heritage, offering players an immersive exploration of the Silk Road's historical significance in Iran. It has to be recalled that as part of UNESCO's Silk Road Programme, a branch of the Silk Road traverses the western and southern edges of Iran's central desert, connecting a series of historic cities, including Kashan, Nain, Yazd, and Kerman, on its route to India.¹² It is designed with both educational and recreational objectives in mind. Accessible via mobile devices with web access, the game provides an engaging way to learn about this important historical trade route.¹³

Link to the gamification:

https://vaezafshar.com/Games/Sericum_Via.html

¹² UNESCO, Silk Roads Programme, *Yazd*, <https://en.unesco.org/silkroad/content/yazd> (accessed July 22, 2024).

¹³ More on the game at "THE SERICUM VIA: A Serious Game for Preserving Tangible and Intangible Heritage of Iran," 9th International Conference of the Arab Society for Computer-Aided Architectural Design: Architecture in the Age of Disruptive Technologies, vol. 1 (Cairo: ASCAAD 2021): 307-316.

Discussion of Results and Future Actions

Fifty heritage initiatives from seven countries were analyzed by seven teams during the spring and early summer of 2024. As mentioned in the introduction, the goal was to select the 14 best practices, with each team choosing two top initiatives from their respective countries or abroad. The selected case studies from the seven countries provide valuable insights into the effectiveness and areas for improvement in gamified cultural heritage projects. By comparing the results, we identified common strengths and weaknesses, as well as unique characteristics that contribute to the success of these initiatives.

Most of the selected heritage initiatives encompass tangible and intangible aspects of heritage, including elements of natural heritage. While the focus is predominantly on local or regional heritage, there are also instances of national and international heritage being addressed. Typically, these initiatives engage with local heritage through the promotion of buildings, storytelling, or a combination of both, often with aims that include community engagement, educational purposes, and preservation.

Community involvement is a significant aspect of these projects, with 13 out of the 14 initiatives incorporating community input into their design, and all but one including it in the development and aftermath stages. Notably, eight of the selected initiatives are located in low-density areas, highlighting their relevance to projects aimed at revitalizing or preserving heritage in less populated regions.

The technologies utilized by the 14 gamifications showcase a diverse and innovative approach to engaging players and enriching their experiences. Geolocation appears as a prominent technology, used in various combinations to create interactive and location-based gameplay. It is paired with QR codes in some games to enhance the interactive element, allowing players to unlock content or solve puzzles by scanning codes at specific locations. Mobile apps are another common technology, often combined with other tools like geolocation, QR codes, or

storytelling, to provide a comprehensive platform for gameplay and narrative immersion. Storytelling is a recurring element, frequently integrated with web-based platforms, mobile apps, and social media to weave narratives and engage players in a more dynamic manner. The use of web pages and social media suggests an emphasis on accessibility and community engagement, often involving hidden clues or interactive content that encourages exploration and collaboration. YouTube is also utilized, primarily for supplementary content or promotional purposes, enhancing the overall experience with visual storytelling.

The analysis of fifty heritage initiatives across seven countries, distilled into 14 exemplary case studies, reveals a rich variety of strengths and areas for improvement in gamified cultural heritage projects. The majority of these initiatives demonstrate high performance in effectiveness, purpose, and meaning, with several projects excelling in ownership and rewards, unpredictability, and completeness. These findings underscore the importance of clear objectives, meaningful rewards, and engaging narratives in enhancing player engagement.

Notable strengths include the integration of diverse technologies such as geolocation, QR codes, and mobile apps, which collectively enhance user experience through interactive and location-based gameplay. The frequent use of storytelling across platforms also contributes to immersive and dynamic narratives. The equipment employed, predominantly mobile devices, reflects a modern approach to accessibility and engagement, while the combination of traditional elements like pen and paper with digital tools highlights an innovative blend of methods.

However, the analysis also reveals significant variability in certain criteria. While most projects score highly in accessibility and inclusion, a few show average performance, indicating room for improvement in making these initiatives more universally accessible and inclusive. Similarly, scores in creativity and originality are mixed, with some projects demonstrating exceptional innovation and others lagging behind, suggesting that future projects could benefit from a greater emphasis on creative approaches.

The lower scores in scarcity and change and disruption point to common weaknesses in maintaining player interest through rare, valuable elements and dynamic changes. Addressing these areas could significantly enhance engagement and long-term player retention. The variation in multiplier effects also highlights a need for more consistent strategies to amplify the broader impact of gamification initiatives.

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