

Article

Maximizing Engagement with Cultural Heritage through Video Games

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Abstract: This paper aims to provide a framework for creating and analyzing cultural heritage games, with the intention of maximizing players' cognitive, emotional, and behavioral engagement with digital heritage. To achieve this, a set of game design characteristics was identified through semi-structured interviews with experts ($n = 16$) and subsequently validated through a discussion with university students ($n = 19$). Grounded theory was then applied to the comments of the experts to create a framework of ten fundamental characteristics, divided into three dimensions: cognitive, emotional, and behavioral. Additionally, an assessment of the literature was conducted to explain and support the inclusion of each game component.

Keywords: video games; digital game-based learning; cultural heritage; heritage education



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1. Introduction

Due to the importance of educating young people about cultural heritage, there is a need to identify effective strategies to increase their involvement. This is especially relevant in light of the massification of tourism, the digitization of cultural heritage, and the deterioration or disappearance of cultural heritage in some parts of the world [1–3]. These issues can be addressed by preparing young people to promote new ways of communicating cultural heritage, develop new methods of participation in culture, and potentially alter their own behavior and influence social change [4–6].

Cultural heritage includes the shared customs, beliefs, values, traditions, language, music, art, literature, and food of a particular group. It also includes the physical remains of a society, such as monuments, architecture, and archaeological sites. Cultural heritage is often seen as a way to pass on knowledge, values, and beliefs from one generation to the next [2,6].

Young people—that is, children aged 6 to 16 years—should learn about their cultural heritage in order to gain a better understanding of their identity, their values, and their place in the world. It can help them to understand their history and the struggles and successes of their ancestors [2]. It can also help to provide a sense of belonging, build pride, and foster a shared sense of purpose [4]. Learning about one's heritage can also help to strengthen intergenerational relationships, foster appreciation for diverse cultures, and promote understanding and tolerance [6].

Schools are a platform for introducing young people to cultural heritage; however, there can be many challenges associated with formal education. These include the sender–receiver communication model, the absence of critical methods and spaces for reflection and debate, and the limited opportunities for in-depth learning [7–9]. Moreover, cultural heritage is not suitably integrated into educational curricula [10].

On the other hand, new technologies have increased the potential for cultural heritage education. The transmission of cultural assets has been revolutionized by digitization, allowing people to “see” attractions, which are historical or culturally significant sites, and

virtually engage in cultural activities through virtual reality, augmented reality, and video games [3,11].

Given that today's youth are an "interactive generation", this article focuses on using interactive digital media, particularly video games, to communicate with them. It is estimated that 78 percent of children and adolescents in Spain play video games [12], highlighting the potential of video games to serve as a new channel for cultural heritage communication and education.

Over the last few years, the development of games based on cultural heritage has grown [13]. These games can be differentiated by their technical and visual characteristics, narratives, rules, mechanics and dynamics, content, and pedagogical characteristics [14–16]. They are often referred to as "games for social change" or "persuasive games", as they are designed to have a purpose, communicate ideas and ideals, and potentially affect players' real-world thoughts and behaviors [17]. In this article, the terms "video games" and "games on cultural heritage" are used interchangeably.

This type of game is becoming increasingly popular, and more educators are interested in using the potential of digital game-based learning to promote cultural heritage teaching. When designed effectively, these games can help to cultivate specific competencies, facilitate the presentation of course material, and offer a type of learning that cannot be experienced in reality [18,19]. For example, in Europe, various programs that utilize video games to teach about cultural heritage in schools have been successfully implemented within the framework of "digital game-based learning" [20].

Educators believe that video games can be a useful tool for engaging young people with cultural heritage. Playing a game can cause someone to become so immersed and focused that they lose track of time [21]. This can result in a greater awareness and comprehension of essential elements of the game (e.g., natural heritage protection in a game like *Alba: A Wildlife Adventure*) and, as a result, a shift in attitude, which can ultimately lead to behavioral change [22]. Despite this, empirical data on the efficacy of video games in cultural heritage teaching have been inconsistent. Some authors have found positive impacts on consciousness, knowledge, attitudes, and behavior, while others have discovered minimal or no impact [18–20]. Nevertheless, research suggests that game design is one of the most important aspects in determining effectiveness.

Beyond the rhetorical framework, games can also provide cultural heritage learning opportunities, since interactive and engaging methods have been hailed as one of the most effective strategies in teaching about this topic [19]. Extensive engagement with games provides opportunities for deep, actively acquired, and critically examined learning [18–20]. Knowledge can be enhanced, and new skills acquired, when players are involved in a medium that they perceive as engaging and motivating. Since good game design is associated with good learning [14,15], understanding how cultural heritage-related games engage and motivate players can help to identify potentially impactful examples to be used in heritage communication and education. Although impact depends on the context and audience, the existing literature provides a design roadmap to increase the chances of game-based cultural heritage engagement. Some of those recommendations form the basis for the analysis framework reported here, such as the importance of providing achievable goals [13], simple messages connected to players' identities [15], and a sense of agency [16].

On the other hand, cultural heritage games can be an effective tool for creating awareness and motivating students to adopt sustainable practices in relation to heritage. Through these games, students can be exposed to various aspects of their cultural heritage and gain a better understanding of the importance of preserving it. By playing the games, students can learn how to best protect and conserve their heritage, while also being encouraged to think critically about the effects of their decisions on the environment [21]. Additionally, these games can promote a greater appreciation of their heritage, which can lead to an increased level of motivation to do their part in preserving it. Through cultural heritage games, students can be empowered to take an active role in the preservation of their cultural heritage and motivated to adopt sustainable practices that help to protect it [23].

This paper seeks to scientifically identify the characteristics of a cultural heritage game that would be most effective at engaging players at the cognitive, emotional, and behavioral levels. To achieve this, 16 semi-structured interviews were conducted with game design specialists to gather a selection of game design characteristics. A group discussion with 19 university students aged 18–25 was conducted to validate the hypotheses, and this was supported by the existing literature. Grounded theory (a qualitative approach) was then applied to the interviews and group discussion to create a framework for analyzing and developing video games that could promote cultural heritage teaching.

1.1. Defining Cultural Heritage Games

When talking about “games on cultural heritage”, we refer to digital games that represent cultural heritage in any form, whether tangible or intangible, natural or man-made, and that have mechanics and dynamics that are oriented toward cultural heritage engagement. These can be screen-based games, virtual reality, or augmented reality games. We make no distinction between serious games (i.e., games with a primary purpose other than entertainment) and entertainment games, firstly for reasons of simplicity, but also because cultural heritage engagement is potentially possible in all types of games [19]. These games have been used and promoted in multiple contexts, sparking collaborations between HCI, game practitioners, and non-profit organizations [14], as well as companies.

A good example of this type of game is *Alba: A Wildlife Adventure*. This is a game about protecting natural heritage. *Alba* is a young girl who visits her grandparents in the *Albufera* of Valencia one summer, and discovers that the natural beauty of the area is in danger. In response, she starts a nature conservation club. *Alba: A Wildlife Adventure* is a game about making the environment around us a better place to be, for both us and the wildlife.

Another example of a cultural heritage game is the *Discovery Tour Mode* of *Assassin's Creed*. This mode lets players take guided tours through Ancient Greece, Ancient Egypt, and the Viking Age to learn more about their history and daily life without being interrupted by combat or quests, so the players are free to visit any tour at any time without interference. The tours are made up of a series of stations connected by a glowing golden path for the players to follow. Each station features voice narration coupled with text and an image of an historical artifact related to the station. This approach seems well-suited to cultural heritage teaching situations where the teacher controls the tour.

1.2. Defining Engagement

In social science research, the concept of engagement has many connotations. These include narrative engagement, which is related to the feelings experienced when engaging with audiovisual narratives on television or in the cinema [24], and player engagement, which is related to the experience of playing games and linked to a multitude of other concepts such as flow [25], immersion [26], and motivation [27]. For this study, we have taken the concept of engagement used in the literature on cultural heritage education, specifically that outlined by [28], which defines engagement with cultural heritage as the individuals' evaluation of and response to cultural heritage. This comprises cognitive, emotional, and behavioral components. We have chosen this approach because it is directly connected to the aim of our study, providing an initial framework to categorize those attributes of video games that create a personal connection with the issue of cultural heritage. Contemporary research into video games deals with these variables from a theoretical perspective.

Ref. [28] suggests that it is not enough for people to know about cultural heritage in order to become engaged; they also need to care about it and to be motivated and able to take action. Hence, our definition of engagement encompasses the three dimensions: the cognitive, the emotional, and the behavioral. Thus, in order to become more engaged with cultural heritage issues, players will: (a) think more and possibly learn more about the issue; (b) feel more personally involved—that is, they will afford the issue greater importance;

and (c) make behavioral changes to express their concern. These characteristics were the basis of our interviews and the group discussion.

2. Methods

2.1. Methodological Approach

This research employs a qualitative and interpretivist methodology for collecting and analyzing data. A framework for creating and analyzing cultural heritage games was developed using grounded theory [29–31]. The data collected from semi-structured interviews with knowledgeable professionals formed the basis for constructing this framework, which aimed to determine which game design features enhanced cultural heritage. College students were then consulted during a group discussion for consensus validation, and a literature review was also conducted to confirm the content's validity.

As [32] outlined, the process of grounded theory starts with the collection of data, followed by the gradual formation of categories (exploratory phase) and the development of a theory before corroboration and connecting to the literature (validation phase) (Figure 1). This approach is nonlinear, and interpretative research is often cyclical. Consequently, analysis requires revisiting and revising data multiple times to refine categories [33].

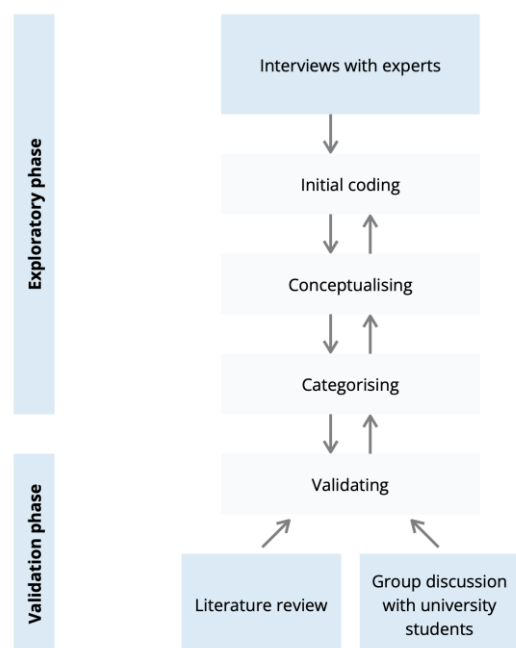


Figure 1. Methodological approach of this study.

Grounded theory has been previously used in the field of game studies to analyze players' identities [34] or the game analysis process [35]. It has also been applied in heritage education to evaluate the effectiveness of heritage education programs [36,37].

2.2. Data Collection

2.2.1. Interview Procedure

The aim of qualitative research is to gain insight into a given phenomenon, not to draw conclusions about a population as a whole [33]. To gain a deeper understanding of this phenomenon, researchers deliberately select study participants (purposive sampling) [38]. For this study, an initial list of specialists was gathered through targeted internet searches, meeting the criteria of (a) being active in the creation of cultural heritage games and (b) being renowned game designers or game studies academics. We then asked them to name more potential candidates that met our criteria (snowball sampling) [39].

The chosen experts were contacted via e-mail or the social networking site Twitter, with four women and twelve men from Europe accepting out of the twenty-four selected

and invited experts (Finland, France, Greece, Italy, Poland, Portugal, Spain, and the United Kingdom). Ten of the sixteen interviewees were affiliated with universities or research institutions (Institute of Leisure Studies, National Research Council of Italy, National Technical University of Athens, University of Lisbon, University of Murcia, and University of Tampere), while the other six were employed by game developer companies (CD Projekt, Deconstructeam, Tequila Works, Ubisoft and Ustwo Games). These specialists have contributed to the production of “games on cultural heritage” (Alba: A Wildlife Adventure, Assassin’s Creed Discovery Tour, Essays on Empathy, Rime, The Witcher 3, and Valiant Hearts: The Great War).

The 16 semi-structured interviews were conducted via Google Meet videoconferencing. After 16 interviews, we determined that there was no need to search for more experts, as no new important information had been identified (i.e., data saturation). This is consistent with the interviewing techniques used in qualitative research [33].

The participants were questioned extensively about their present projects and the advantages or disadvantages of using cultural heritage games as a way of teaching and connecting with young people. They were also asked to explain the qualities a video game about cultural heritage should possess in order to have the most impact on the players, mentally, emotionally, and behaviorally. The interviews were, on average, 30 min long, ranging from 20 to 40 min, and were recorded and immediately transcribed. Following this, two rounds of summary and revision of the transcribed interviews were conducted.

2.2.2. Group Discussion Procedure

We conducted a group discussion with 19 students aged 18 to 25 from a bachelor’s degree program in elementary teaching in order to validate our findings and test the hypothesis generated from our interviews. These students were chosen for the discussion due to their potential for using video games as a teaching tool for cultural heritage education, as they are the future educators and teachers, and the age range also represents a high proportion of players [12].

In our exploratory qualitative study, we chose a purposive sampling group of university students aged between 18 and 25 from various socioeconomic backgrounds in order to deepen our understanding of a particular phenomenon, rather than to generalize a given population [33].

For the group discussion, a period of class time was allotted and the researcher acted as the facilitator. The researcher started by elucidating the intention and format of the conversation, and then requested that the participants pretend they were staff of a video game production business that had been asked to devise a game involving cultural heritage. The scholars were asked to devise concepts that would make the game appealing to players, establish an emotional link, and motivate them to effectuate actual changes based on what they had learnt. To further augment the game, afterwards, they suggested additional game components and disseminated their thoughts with their comrades.

2.3. Data Analysis

We used an iterative methodology for our research analysis (Figure 2), even though the article is organized linearly. After previously describing the data gathering process, we will now discuss the coding procedures used to create the categories and the validation procedure.

At the outset, we opted for segments of talk that conveyed ideas. Subsequently, we employed line-by-line coding, which necessitated sorting every line of writing from a discerning and appraising outlook. We subsequently utilized both conspicuous and secret codes connected to the studied theme and the theory’s development. Furthermore, we wrote down “notes” in the borders of the field notes. Since this study used a social-constructivist methodology, it was essential for the investigators to be mindful of any pre-existing presumptions which might have swayed their “construction” of the theory.

Altogether, 54 codes were implemented: actions, art, attention, attitudes, awareness, behaviour, beliefs, choices, collaboration, community, concepts, connection, consequences, conservation, contents, context, culture, decisions, design, easy, emotional, empathy, exploration, gameplay, gamification, graphics, history, identity, information, interaction, interesting, involvement, knowledge, learning, narrative, navigation, needs, objectives, participation, play, problems, protect, puzzles, questions, risk, satisfaction, sense of agency, sense of belonging, skills, social, story, sustainability, and values. Table 1 shows samples of the first coding process.

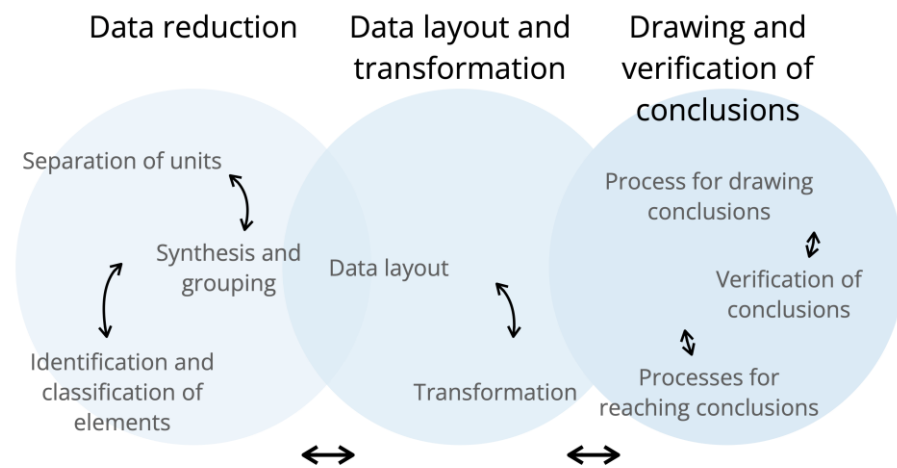


Figure 2. Iterative data analysis steps.

Table 1. Examples of passages and corresponding codes.

Passages	Codes
Cognitive “I think that games should not rely only on one form of interaction when considering how playing Assassin’s Creed affects students’ view of heritage.”	Design, gameplay, information, interaction, knowledge, learning
“The game structure should be clear and simple, with a main quest and side quests.”	Actions, contents, design, easy, gamification, objectives, problems
Emotional “Narratives have the power to make people understand and sympathize with other people’s circumstances and viewpoints.”	Emotional, empathy, narrative, social, story
“Players should be able to make an emotional connection between the events experienced by the main characters in video games and similar events in their own lives.”	Connection, emotional, empathy, identity, narrative, story
Behavioral “Cultural heritage games must help students become more aware of the needs around them and give them the confidence to respond to these needs.”	Awareness, needs, sense of agency
“Cultural heritage games should be focused on encouraging students to think about what it means to be a citizen, rather than training them to be historians.”	Behaviour, community, participation, social

We used MAXQDA software [40] to create word clouds (Figures 3–5) which show the most commonly used words, in order to give a visual representation of our basic understanding of the data we analyzed.



Figure 3. Word cloud for “cognitive”.



Figure 4. Word cloud for “emotional”.



Figure 5. Word cloud for “behavioral”.

Despite the diversity of the organizations for which the study’s participants work, their responses displayed many similarities.

The following step was to categorize the codes according to their meaning in order to form broader concepts. This is known as “focused coding” in grounded theory analysis and is more detailed, abstract, and selective than the initial coding stage. This process involves examining the single codes to recognize the most common and significant ones in order to analyze and classify the data [29]. The frequency of appearance across the passages and the strength of expression are taken into account [41]. This continual examining and correcting process is an essential part of grounded theory evaluation [31].

By grouping codes that were alike, the following concepts emerged: gameplay tasks (actions, choices, decisions, exploration, navigation, objectives, play, problems, puzzles, questions, skills); aesthetics (art, graphics); consciousness (attention, awareness, interesting, risk); moral (attitudes, behaviour, beliefs, connection, involvement, sense of agency); social involvement (collaboration, community, needs, participation, social); information (concepts, contents, culture, history, information, knowledge, learning); repercussions (consequences, sustainability); heritage issues (conservation, protect); storytelling (context, narrative, story); gameplay satisfaction (easy, design, gameplay, gamification, interaction, satisfaction); and sympathy (emotional, empathy, identity, sense of belonging, values).

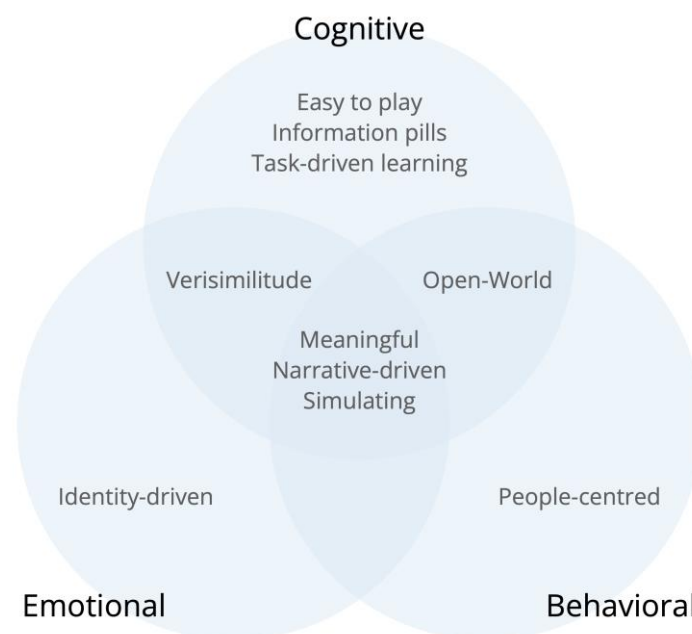
The focused coding process was followed by the theoretical coding step. This integrative approach was chosen due to its greater accuracy and ability to create connections between the codes selected, leading to a stronger analysis. Data were continually compared, and the researcher reflected on both the original text and the notes taken to form the final ten core categories, which represent the game design elements suggested by the participants (Table 2).

Table 2. Core categories proposed as game design features.

Core Categories	Concepts, Codes
Easy to play	Easy, gameplay tasks, gameplay satisfaction, objectives, play, problems, puzzles
Identity-driven	Aesthetics, empathy, identity, sense of belonging, sympathy
Information pills	Concepts, contents, culture, history, information, knowledge, learning
Meaningful	Beliefs, connection, consciousness, consequences, involvement, moral, sense of agency
Narrative-driven	Narrative, storytelling
Open-world	Exploration, gameplay tasks, navigation, play
People-centered	Collaboration, community, needs, participation, social involvement
Simulating	Choices, consequences, gameplay tasks, heritage issues, information, problems, puzzles, repercussions
Task-driven learning	Actions, choices, decisions, gameplay tasks, information, knowledge, learning, objectives, play, problems, puzzles, questions, skills
Verisimilitude	Aesthetics, heritage issues, information, repercussions, storytelling

In the final phase of the study, links between the core categories were established in order to construct a cohesive framework. Engagement would act as the catalyst for heritage education if we perceived games as effective means of persuasion. After we identified the game design elements, we divided them into cognitive, emotional, and behavioral aspects of engagement [42,43].

Figure 6 showcases the categories that formed and their connections as a result of our effort to create a theory regarding cultural heritage education using video games. As can be seen, some participants had difficulty distinguishing the three simultaneous dimensions of engagement from the game design elements. Therefore, certain game design elements are found in two or three dimensions.

**Figure 6.** Conceptual framework for cultural heritage engagement through video games.

This framework is composed of three dimensions and ten game elements. It implies that in order to create an engaging game about cultural heritage, it is necessary to appeal to both cognitive and emotional sensibilities. The game should have an immersive and credible open world that can be navigated in various ways, with a narrative that is centered on the player and their values and experiences. Furthermore, audio-visual and verbal communication should be given careful attention. The game should be easy to comprehend,

allowing players to progress through missions that connect certain actions to specified outcomes. Players should be able to progress through the game at their own speed and feel like their actions can affect the game's occurrences. When the narrative and gaming mechanics work together, the chance that the skills gained in the game can be applied to the real world is increased.

We held a group discussion with university students who were pursuing a bachelor's degree in elementary school education to validate the components of the framework. We employed "theoretical sampling" in this process (we obtained more information based on the categories that we had identified earlier). The results of the group discussion were consistent with the comments made by the experts regarding important game design characteristics. Both professionals and students identified the same attributes and placed them within the same dimensions. Table 3 summarizes the students' responses and shows their relationships to the core categories. There were no new categories found. Thus, we conclude that we have achieved theoretical saturation and that the proposed framework has been validated by consensus.

Table 3. Correlation between student feedback and core categories.

Student's Feedback	Core Categories
Cognitive	
"Heritage information should be incorporated into the game's story, not kept apart."	Information pills, narrative-driven
"In-game photography."	Easy to play, identity-driven, meaningful, simulating
"Different tasks or challenges that draw on the heritage should be embedded in the game's narrative."	Task-driven learning
"Players should be given the freedom to make choices that shape the narrative."	Meaningful
"Non-linear narrative structure."	Narrative-driven, open-world
Emotional	
"The narrative should be focused on people as well as the heritage."	Identity-driven, narrative-driven, people-centered
"The game should have an appealing and captivating environment."	Identity-driven, meaningful, open-world
"The music and sound design of the game should be in line with the game's scenario."	Verisimilitude
"In-game connections with emotions (e.g., family, community)."	Meaningful
"The heritage should be preserved in the game."	Meaningful
Behavioral	
"Non-playable characters with believable behaviors should be included to keep players engaged."	People-centered
"The consequences of players' decisions and reactions should be shown."	Simulating
"Players should be encouraged to apply what they have learned in the game to the real world."	Meaningful, simulating, task-driven learning
"Small actions can make a big difference."	Meaningful
"The player's character should be able to experience the heritage within the game."	Meaningful

3. Results

This section explains the core categories of the framework through participants' responses and feedback from students during the group discussion. The data are kept and examples are chosen to serve as evidence for the categories. A review of cultural heritage

communication and the literature on education, along with game design, assists in giving structure to the outcomes and content confirmation for the ultimate framework.

3.1. *Easy to Play*

Experts have defined game mechanics as the rules governing the gameplay. They emphasize that game mechanics should be kept simple to avoid distracting players from interpreting the story [44]; in addition, they should be used as metaphors to tell a story. For example, an interviewee noted that “the gameplay should be designed so as to reflect the narrative of the game.”

3.2. *Identity-Driven*

Games about cultural heritage should be appealing not only to the players’ current identities, but also to the identities to which they aspire [45]. Developing main and secondary characters that players care about and can assist is an effective way to build an emotional connection to heritage, as these characters can reflect the dynamic between communities and heritage [46]. The player can embody the characters (in a first- or third-person game), or the AI can control them. Allowing the player to customize the character’s appearance or take photos of the heritage in the game can further enhance the personal connection.

3.3. *Information Pills*

Game developers should help players to efficiently simplify the information in games. Many cultural heritage games fail because they contain too much text, rather than connecting heritage to the game narrative and mechanics. Cutscenes should be used to explain information in a meaningful way. As one expert said, the core message should be conveyed through gameplay, not through a lot of text, so that players can understand it quickly.

3.4. *Meaningful*

Having an understanding of cultural heritage is not sufficient; to generate more attention and engagement, one must create an emotional bond between the heritage and the audience. There is not a specific method to guarantee the perfect “emotional experience” in a game. Yet, research has suggested that if the visuals and messages in the game reflect the fear of losing heritage, it should be coupled with feelings of hope and solutions that are associated with people’s everyday lives in the cultural heritage world [47]. Otherwise, they may perceive a sense of helplessness.

3.5. *Narrative-Driven*

Many of the experts interviewed believe that game narrative is a key element for achieving engagement and motivation. Narratives can assist in information processing and offer value and emotional appeal to the information presented [48]. Some experts argued that many cultural heritage VR and AR apps fail due to a lack of a narrative meaning to the users. The students in the university discussion highlighted the importance of narratives, with some of them mentioning “emergent narratives” [49]. Some specialists argued that it is not beneficial to lead the gamer along a linear narrative, and instead suggested prioritizing the formation of systems that will result in multiple narrative outcomes.

3.6. *Open-World*

It is also essential to consider the extent of freedom given to players. The freedom to explore an open-world game can be likened to travelling in real life. An interviewee said “players should be given the option to pursue the main storyline or to uncover the numerous secrets hidden within the game”. Experts proposed that open-world games can better replicate real heritage settings. However, game developers should be aware of the concept of gamification in terms of flow experiences. An optimal flow state implies that the individual can solve the presented challenges [50], which is essential for influencing freedom, engagement, and immersion [51].

3.7. People-Centered

Findings from the interviews indicated that engaging with characters in the game, or connecting with other players, can lead to behavioral change. Strategies for encouraging this include helping the characters to complete their objectives in the game, participating in a collective effort, incorporating elements from social media, or embedding the game in an educational or social context. A further way to engage players could be to link tasks within and outside of the game, for instance, by utilizing geo-locations in augmented reality (AR) games. These types of games unite the virtual world with reality and motivate players to interact with each other [52].

3.8. Simulating

Designing difficult tasks or puzzles that imitate real-life scenarios can be an effective way to keep players interested. Individuals can use immersive simulations to explore fictional worlds and carry out activities they may not be able to perform in reality [53]. Experts and students agree that games can make players aware of the consequences of their choices. To maximize the learning potential of such games, experts suggest that developers should create cultural heritage games that give players the opportunity to customize the results through manipulating various variables. Exploring the various outcomes of these games can teach players about the complexity of preserving cultural heritage.

3.9. Task-Driven Learning

Research indicates that emotions are triggered more effectively through experience than through simply acquiring knowledge [54,55]; this makes video games a beneficial tool, as they offer players the ability to develop by reflecting on their own actions [56]. It is recommended that the game have a range of tasks and goals for players to progress through, and that trial and error should be encouraged. An individual who was interviewed on the subject suggested that this is the key to effective and engaging cultural heritage games.

3.10. Verisimilitude

The sense of verisimilitude encourages players to believe that the game world is real; hence, the scientific background and concepts, as well as the “visuals” in cultural heritage games, should be from trusted sources such as geographers, historians, heritage experts, etc. [57]. It is also important to consider the institutions that the target audience finds most reliable, such as museums or art centers. University students suggested that games could feature characters that are sources that players trust (e.g., a historian, a professor, a scientist).

4. Discussion and Conclusions

Cultural heritage games are an important tool for heritage education because they provide an engaging and interactive way to educate people about the importance of preserving cultural heritage. By playing these games, people can learn about the history and culture of their region while also gaining a deeper appreciation for the importance of preserving cultural heritage. Cultural heritage games can also act as a bridge between cultures, enabling people to share and learn from each other’s cultural traditions. By playing these games, people can gain a better understanding of different cultures and develop an appreciation for the diversity of human cultures. In addition, these games can help to build unity and solidarity among different cultures and to promote sustainability attitudes in players [58,59]. By playing these games, people can be exposed to a wide range of cultural expressions and gain a better understanding of the importance of preserving cultural heritage.

This paper introduces a framework made up of three dimensions (cognitive, emotional, and behavioral) and ten game features, determined by game developers, game studies experts, and students. This is a starting point for designing and evaluating cultural heritage games that can engage young people intellectually, emotionally, and behaviorally. Research

using word clouds indicated that the distinctions between the game attribute categories are not clearly defined, as the same attribute can often fit into multiple dimensions. It is interesting to note that experts and students were in agreement about what game characteristics would be the most engaging for young players.

Both the experts and students indicated that constructivism is the preferred approach for learning, as it promotes a multi-outcome-oriented system that allows for a variety of actions and encourages a deeper level of understanding. This approach is seen as more engaging than a “drill and practice” strategy, which simply focuses on passing on information and does not allow the learner to generate their own knowledge.

Further research is necessary in this field, which could involve testing the framework on existing cultural heritage games and creating a checklist to show the presence or absence of the 10 key features. In addition, new games could be created or existing ones could be modified in order to include the proposed attributes and to assess their cognitive, emotional, and behavioral impacts when used separately or together. Additionally, boundary conditions related to age, topics, and populations should be evaluated.

Existing content reviews have analyzed cultural heritage games, but they present issues. A review of spatial games for cultural heritage from 2017 [20] noted that most had been published between 2008 and 2010 and focused on the local heritage, but the sample is now outdated and the analysis did not focus on engagement potential. A more recent review of VR games [60] noted a tendency to incorporate positive elements such as a focus on storytelling and visualization of cultural heritage assets, as well as their surroundings, but this review focused only on VR games. Finally, other game reviews focused on heritage as a whole [13,18,19] and, thus, their findings are difficult to contextualize regarding cultural heritage engagement.

Furthermore, representations of cultural heritage in entertainment games have been less explored when approaching the topic. As a result, the ways in which games for entertainment may engage players are largely unknown, except for a few examples. The study described in [19] found different types of relationships between humans and environments in video games, including the environment as mere backdrop, resource, antagonist, and text, but these were only implicitly (albeit importantly) related to cultural heritage. Thus, no systematic analysis of cultural heritage affordances in video games for entertainment exists, let alone a comparison with those of serious games. Finally, mobile games, suitable for realizing the potential of pervasive gaming [17], also lack attention, as do recent developments in the area of immersive virtual reality.

There is also research that indicates that video games, when used by cultural institutions such as museums, can be transformed into tools to assess the social impact of cultural heritage sites [14]. Video games are a powerful way to interact with a topic, and they can provide insight into a particular culture or place. By using video games to assess the social impact of cultural heritage sites, it is possible to gain a better understanding of the importance of the site to the local community and to the wider society.

Nevertheless, the present study is somewhat limited due to its seminal contribution to the debate on how to better design and use games for heritage education. This is a pioneering approach to the state of the art of the design of cultural heritage games. Another limitation of the study is due to its constructionist, interpretative approach and to the active role of the researchers in “constructing” categories, even though the theory is “grounded” in empirical data. It has been our intention to address this issue by adding consensus and content validity to the framework, as well as reaching theoretical saturation. Our analysis shows strong links between codes, concepts, and categories, and our arguments are put forward in a coherent manner. In that sense, we constantly compare elements to examine the codification, decide if the data are consistent with previous classifications, and promote a more reflective analysis of the data. Even though this exploratory study is not intended to generalize data to a population, but to increase our understanding of cultural heritage games, we feel obliged to mention the limited sample size and the method used for the interviews and group discussion. Having said that, we would encourage

researchers to replicate this study with larger and more diverse samples to corroborate or refute our findings.

In conclusion, we hope this approach offers new insights and lays the foundations for further research.

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