

IONIAN UNIVERSITY



FACULTY OF INFORMATION SCIENCE & INFORMATICS
DEPARTMENT OF ARCHIVES, LIBRARY SCIENCE
AND MUSEOLOGY

Master of Science in
«Digital Information Management - Information Services»

MASTER'S THESIS
«Gamification at the Museum: An Alternative Visit or Something More?
(Case Study: Archaeological Museum of Veria, Greece)»

Alexandra Theodoridou

Corfu February, 2026

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Acknowledgements / Dedication

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Abstract

Gamification refers to the use of game elements in non-game environments, with the aim of enhancing participation, learning and/or collaboration, as well as helping to achieve the wider aims and objectives of that environment. In museum and wider cultural environments, through gamification visitor-users are encouraged to take actions, compete, win prizes and develop skills, while fulfilling the objectives of the museum or cultural space, which are usually cognitive, metacognitive and others. Examples include the use of points accumulation, rewarding, prevailing in competition with other visitor-users. As part of this work, after researching the environment, a targeted game application was developed for the Archaeological Museum of Veria with the title: "Mytholog-izing in the Archaeological Museum of Veria".

The researcher collaborated with the staff of the Archaeological Museum of Veria, as well as with experts in gamification in the context of international collaborations of the Museology Laboratory of the Ionian University (see <https://ivetagr.org/pact4skills/> - Cyprus, France, Georgia, Italy , Netherlands. See also indicative gamification at https://ivetagr.org/p4s__/).

Keywords

Gamification, Museology, Cultural Heritage, Archaeology, Mythology, Archaeological Museum of Veria.

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«Παιχνιδοποίηση στο μουσείο: μια εναλλακτική επίσκεψη ή κάτι περισσότερο; (Μελέτη Περίπτωσης: Αρχαιολογικό Μουσείο Βέροιας, Ελλάδα)»

Περίληψη

Η παιχνιδοποίηση (gamification) αναφέρεται στη χρήση στοιχείων παιχνιδιού σε περιβάλλοντα που δεν αποτελούν παιχνίδια, με στόχο την ενίσχυση της συμμετοχής, της μάθησης και/ή της συνεργασίας, καθώς και τη συμβολή στην επίτευξη των ευρύτερων σκοπών και στόχων του εκάστοτε περιβάλλοντος. Στα μουσειακά και γενικότερα στα πολιτιστικά περιβάλλοντα, μέσω της παιχνιδοποίησης οι επισκέπτες-χρήστες ενθαρρύνονται να αναλαμβάνουν δράσεις, να ανταγωνίζονται, να κερδίζουν έπαθλα και να αναπτύσσουν δεξιότητες, ενώ παράλληλα εκπληρώνουν τους στόχους του μουσείου ή του πολιτιστικού χώρου, οι οποίοι είναι συνήθως γνωστικοί, μεταγνωστικοί και άλλοι. Ενδεικτικά παραδείγματα αποτελούν η συσσώρευση πόντων, η επιβράβευση και η επικράτηση σε ανταγωνισμό με άλλους επισκέπτες-χρήστες.

Στο πλαίσιο της παρούσας εργασίας, μετά από έρευνα του περιβάλλοντος, αναπτύχθηκε μια στοχευμένη παιγνιώδης εφαρμογή για το Αρχαιολογικό Μουσείο Βέροιας με τίτλο: «Μυθολογ-ώντας στο Αρχαιολογικό Μουσείο Βέροιας».

Η ερευνήτρια συνεργάστηκε με το προσωπικό του Αρχαιολογικού Μουσείου Βέροιας, καθώς και με ειδικούς στην παιχνιδοποίηση στο πλαίσιο διεθνών συνεργασιών του Εργαστηρίου Μουσειολογίας του Ιονίου Πανεπιστημίου (βλ. <https://ivetagr.org/pact4skills/> - Κύπρος, Γαλλία, Γεωργία, Ιταλία, Ολλανδία. Βλ. επίσης ενδεικτική παιχνιδοποίηση στο https://ivetagr.org/p4s__/).

Λέξεις-κλειδιά Παιχνιδοποίηση, Μουσειολογία, Πολιτιστική Κληρονομιά, Αρχαιολογία, Μυθολογία, Αρχαιολογικό Μουσείο Βέροιας.

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List of Abbreviations

Abbreviation	Explanation
UX	User Experience
IU	Ionian University

CHAPTER 1 - INTRODUCTION

1.1 Purpose of the Study

Museums today operate within an increasingly digital, participatory, and experience-driven cultural landscape. As institutions seek new ways to engage diverse audiences, gamification has emerged as a promising interpretive and educational strategy capable of transforming visitor interaction with cultural heritage. This study investigates the potential of gamification within the Archaeological Museum of Veria, focusing on the design, implementation, and evaluation of the digital game *“Mythologizing at the Archaeological Museum of Veria.”*

The purpose of the study is twofold. First, it aims to explore how digital, narrative-driven, and playful experiences can enhance visitor engagement and support informal learning in museum environments. Second, it examines how mythology – specifically the figure of Medusa – can serve as a narrative and interpretive framework for connecting visitors with archaeological content. Through the development and assessment of the game, the study seeks to contribute to broader discussions on digital innovation, museum education, and cultural mediation.

1.2 Research Aim and Objectives

The overarching aim of this thesis is to evaluate the effectiveness of gamification as a tool for enhancing the educational experience of museum visitors. To achieve this aim, the study pursues the following objectives:

First, to examine the theoretical foundations of gamification and its relevance to museum education and digital cultural heritage.

Second, to investigate the characteristics, expectations, and learning needs of visitors to the Archaeological Museum of Veria.

Third, to design and develop the digital game *“Mythologizing at the Archaeological Museum of Veria,”* integrating narrative, mythology, and archaeological content.

Fourth, to evaluate the game’s usability, educational value, and experiential impact through user testing and qualitative feedback.

And last, to formulate recommendations for the future application of gamification in cultural institutions and for the further development of the game.

These objectives reflect the interdisciplinary nature of the research, situated at the intersection of museology, digital information management, pedagogy, and interactive design.

1.3 Research Question

The study is guided by the following central research question:

To what extent can a digital gamification application enhance the educational experience of visitors to the Archaeological Museum of Veria by using mythology as a means of approaching cultural heritage?

Supporting sub-questions include:

- How can gamification principles be effectively adapted to a museum context?
- In what ways does mythological storytelling influence visitor engagement and learning?
- What design features contribute to usability, accessibility, and meaningful interaction?
- How do visitors perceive and evaluate the game in terms of educational value and enjoyment?

1.4 Rationale and Significance

The rationale for this study is grounded in both personal and academic motivations. The Archaeological Museum of Veria, located near the researcher's home, provided an accessible and supportive environment for iterative observation, collaboration, and testing. The monumental bust of Medusa at the museum's entrance served as a compelling interpretive anchor, inspiring the development of a narrative-driven digital experience.

From a scholarly perspective, the study responds to contemporary shifts in museology, where digital technologies increasingly shape how visitors encounter and interpret cultural heritage. Gamification, in particular, offers opportunities to foster intrinsic motivation, deepen engagement, and support experiential learning. Yet, despite

its growing prominence internationally, gamification remains underexplored within Greek museum practice.

This research contributes to the field by offering a practical case study of gamification in a regional archaeological museum, demonstrating how mythology can function as a narrative bridge between visitors and material culture, providing empirical insights into visitor perceptions and learning outcomes, and proposing design guidelines for future digital heritage applications.

1.5 Scope and Limitations

The scope of the study is defined by several parameters, including the research focuses on a single museum, the Archaeological Museum of Veria, the digital application centers on one mythological theme, the story of Medusa.

The evaluation sample is limited in size, reflecting an exploratory qualitative approach rather than a statistically representative study. The development of the game was shaped by time constraints and the capabilities of the P4S platform. Finally, the evaluation relies on qualitative and descriptive methods, which may not capture all dimensions of visitor experience.

These limitations provide context for interpreting the findings and identifying directions for future research.

1.6 Structure of the Thesis

The thesis is organized into nine chapters. Chapter 1 introduces the study's purpose, aims, research question, rationale, scope, and structure. Chapter 2 presents the theoretical framework, focusing on gamification, museum education, visitor engagement, and mythology. Chapter 3 reviews relevant literature on gamification, digital cultural heritage, UX design, and digital information management. Chapter 4 examines the Archaeological Museum of Veria and the interpretive potential of the Medusa theme. Chapter 5 describes the design and development of the digital game. Chapter 6 outlines the research methodology. Chapter 7 presents the evaluation findings. Chapter 8 discusses the implications of the results. Chapter 9 concludes the study and offers recommendations.

CHAPTER 2 – THEORETICAL FRAMEWORK

2.1 Gamification: Definitions, Models, and Contemporary Approaches (2023–2025)

Gamification has evolved into a central concept within contemporary educational technology, reflecting a broader shift toward experience-driven and motivationally informed design. Early definitions conceptualized gamification as the application of game elements in non-game contexts [DDK+11]. However, recent scholarship argues for a more holistic understanding that emphasizes experience design, intrinsic motivation, and emotional engagement [ZS24]. At the core of modern gamification theory lies Self-Determination Theory (SDT), which posits that human motivation is driven by the fulfillment of three psychological needs: autonomy, competence, and relatedness [DR00]. Gamified systems that support these needs by offering meaningful choices, achievable challenges, and opportunities for social connection, and are more likely to foster sustained engagement [HKS14].

Several theoretical models inform contemporary gamification design. The MDA Framework (Mechanics–Dynamics–Aesthetics) provides a structured lens for understanding how system rules (mechanics) shape user behavior (dynamics) and emotional experience (aesthetics). Recent adaptations highlight the importance of narrative immersion and affective resonance as core aesthetic outcomes. The Octalysis Framework, developed by Yu-kai Chou, identifies eight motivational “core drives” that influence user behavior. Contemporary applications emphasize balancing extrinsic and intrinsic motivators, particularly in cultural and educational contexts. Hybrid and technology-enhanced models integrate augmented reality (AR), artificial intelligence (AI), and adaptive learning systems, enabling personalized and context-aware gamified experiences [MCB+14].

Despite its potential, gamification is not without challenges. Scholars caution against superficial implementations that rely solely on points or rewards, warning that such approaches risk trivializing content or undermining intrinsic motivation [SF15]. In cultural heritage contexts, designers must also ensure that gamified experiences respect the integrity and cultural significance of the material being interpreted.

The digital game *“Mythologizing at the Archaeological Museum of Veria”* aligns with contemporary approaches by prioritizing narrative depth, emotional engagement, and meaningful interaction over purely extrinsic incentives.

2.2 Gamification in Museum Education and Digital Cultural Heritage

Museums have undergone significant transformation in recent decades, shifting from object-centered institutions to participatory, visitor-centered environments. Digital technologies—ranging from mobile applications to immersive AR/VR installations—have become integral to this shift, enabling new forms of engagement, interpretation, and learning [Mar08]. Within this evolving landscape, gamification has emerged as a powerful pedagogical mediator. It supports informal and experiential learning, curiosity-driven exploration, active meaning-making, emotional and cognitive engagement, visitor autonomy and agency. In digital cultural heritage, gamification enables museums to present archaeological content in ways that are accessible, interactive, and user-centered [MCB+14].

The game *“Mythologizing at the Archaeological Museum of Veria”* embodies these principles by transforming the museum visit into a structured journey of discovery, where visitors engage with mythological narratives and archaeological artifacts through playful tasks and interpretive challenges.

2.3 Visitor Engagement, Learning, and Experience

Visitor engagement is a multidimensional construct encompassing cognitive, emotional, social, and behavioral dimensions [FD13]. Gamification has the capacity to enhance each of these dimensions. Cognitive engagement through problem-solving, interpretation, and knowledge acquisition. Emotional engagement through narrative immersion, curiosity, and aesthetic appreciation. Social engagement through shared experiences and collaborative meaning-making. Finally, Behavioral engagement through active participation and exploration. Museum learning is inherently informal and experiential. Visitors construct meaning through personal interpretation, prior knowledge, and emotional resonance. Gamification strengthens these processes by providing structure, feedback, and motivational scaffolding while preserving the open-ended nature of museum exploration [HKS14].

The game *“Mythologizing at the Archaeological Museum of Veria”* integrates these dimensions by offering a narrative-driven experience that encourages visitors to observe, interpret, and reflect on the museum’s collections.

2.4 Mythology, Narrative, and Emotional Engagement

Mythology occupies a central place in Greek cultural identity and collective memory. As symbolic narratives that blend history, imagination, and moral reflection, myths offer rich opportunities for learning, emotional engagement, and cultural interpretation [Bux11]. In museum contexts, mythology can function as a narrative bridge connecting visitors to archaeological artifacts, a cognitive scaffold supporting interpretation, an emotional catalyst deepening engagement and a creative framework for playful and immersive experiences. The myth of Medusa is particularly compelling. As both a protective symbol and a tragic figure, Medusa embodies themes of transformation, fear, beauty, and power. Her monumental bust at the entrance of the Archaeological Museum of Veria serves as a powerful interpretive anchor.

In *“Mythologizing at the Archaeological Museum of Veria”*, Medusa’s story unfolds gradually through missions, puzzles, and interactions with exhibits. This narrative progression enhances emotional engagement and supports deeper connections between visitors and the museum’s cultural content.

2.5 Synthesis: Linking Theory to the Game “Mythologizing”

The theoretical framework presented in this chapter establishes the conceptual foundations for understanding how gamification, digital interpretation, and mythological storytelling intersect within museum environments. The game *“Mythologizing at the Archaeological Museum of Veria”* (<https://ivetagr.org/p4s/>) embodies these principles in several ways: It applies contemporary gamification models that emphasize intrinsic motivation, narrative immersion, and emotional resonance. Also, it integrates mythology as a narrative and interpretive tool, using Medusa as a symbolic and educational anchor. Furthermore, it supports visitor engagement across cognitive, emotional, social, and behavioral dimensions. Also, it aligns with museum education principles, promoting active learning, exploration, and meaning-making. Finally, it contributes to digital cultural heritage by offering an accessible, playful, and pedagogically grounded experience.

This synthesis provides the conceptual foundation for the subsequent chapters, which examine the museum context, the design and development of the game, and the evaluation of its educational impact.

CHAPTER 3 – LITERATURE REVIEW

3.1 Gamification in Education

Gamification has become a prominent field within contemporary educational research, reflecting a broader pedagogical shift toward learner-centered, motivationally informed instructional design. Foundational works [Kap12, ZC11] established that game element, such as challenges, feedback loops, and reward structure, can enhance learner motivation and engagement when meaningfully aligned with educational objectives. More recent scholarship emphasizes that gamification's effectiveness depends not merely on the presence of game mechanics but on their integration within coherent pedagogical frameworks that support autonomy, competence, and relatedness.

International studies consistently demonstrate that gamification can increase learner persistence and attention, promote deeper cognitive processing, foster positive emotional engagement, and encourage collaborative learning behaviors. When grounded in constructivist principles, gamification enables learners to build knowledge through interaction and discovery rather than passive reception.

Within this context, the digital game *"Mythologizing at the Archaeological Museum of Veria"* leverages gamification to transform the museum visit into a quest-based learning experience. By decoding mythological clues and interacting with archaeological content, players engage in a form of experiential learning that aligns with contemporary educational theory.

3.2 Digital Games and Cultural Heritage

Digital games have gained increasing recognition as powerful tools for cultural heritage interpretation. Serious games—designed for educational rather than purely entertainment purposes—offer immersive environments where users can explore historical narratives, interact with virtual reconstructions, and engage with cultural content in multimodal ways [AML+09].

In cultural heritage contexts, digital games support Multimodal learning, integrating text, imagery, audio, and interaction; Contextualization of artifacts, situating objects within broader historical or mythological narratives; Emotional engagement, which

enhances memory and interpretive depth; Last, Accessibility, enabling diverse audiences to engage with heritage content.

Mortara et al. [MCB+14] argue that serious games can bridge the gap between museum collections and contemporary audiences by offering narrative-rich, interactive experiences that foster curiosity and sustained engagement. However, scholars caution that digital games must respect cultural authenticity and avoid oversimplifying complex historical material.

The game *“Mythologizing at the Archaeological Museum of Veria”* aligns with these principles by using mythological storytelling to animate archaeological content. The game encourages visitors to explore the museum space, observe exhibits closely, and connect artifacts with the Medusa narrative.

3.3 User Experience and Interaction Design in Museums

User Experience (UX) design is a critical factor in the success of digital applications in museums. Effective UX ensures that digital tools are intuitive, accessible, and aligned with visitor needs. Norman [Nor13] emphasizes that good design minimizes cognitive load, enabling users to focus on content rather than interface mechanics. Similarly, Shneiderman et al. [SPC+16] highlight the importance of clarity, consistency, and feedback in interaction design. In museum contexts, UX design must also consider the physical environment of the museum, the diversity of visitor backgrounds and abilities, the need for narrative coherence, and the integration of digital tools with physical exhibits. Greek researchers stress that digital applications must respect the cultural and spatial context of museums, ensuring that technology enhances rather than distracts from the visitor experience [RPS17].

The game *“Mythologizing at the Archaeological Museum of Veria”* incorporates UX principles through clear visual design, accessible navigation, and a narrative structure that guides players through the museum’s mythological themes. These elements support a seamless experience that encourages visitors to engage deeply with both digital and physical components of the museum.

3.4 Digital Information Management in Cultural Institutions

Digital information management is essential for the sustainability and effectiveness of digital heritage applications. Museums increasingly manage large volumes of digital

content (images, metadata, narratives, and educational materials) which must be organized, preserved, and made accessible [Bac16, Gil16]. Effective digital information management ensures metadata quality, interoperability, long-term preservation, accurate representation of cultural content, and alignment with institutional goals. Conway [Con10] highlights the challenges posed by rapid technological change, emphasizing the need for strategic planning and sustainable digital infrastructures. Greek scholarship similarly identifies issues related to documentation, preservation, and the integration of digital tools into museum workflows [SS23].

For the game *“Mythologizing at the Archaeological Museum of Veria”*, digital information management ensures that mythological narratives, artifact descriptions, and interactive tasks remain accurate, sustainable, and aligned with the museum’s interpretive mission.

3.5 International and Greek Scholarship: Convergences and Gaps

Across international and Greek literature, several converging themes emerge: Digital tools enhance visitor engagement when grounded in pedagogical purpose. Gamification is most effective when integrated with meaningful content and narrative. Also, UX design is essential for ensuring accessibility and usability. Last, museums must adopt sustainable digital information management practices. Mythology offers a powerful narrative framework for cultural interpretation. However, notable gaps remain: Limited case studies on gamification in Greek regional museums. Also, few empirical evaluations of visitor learning outcomes in gamified museum experiences. Insufficient research on mythology-based gamification as a tool for cultural interpretation. A need for more studies integrating digital information management with gamified applications.

The game *“Mythologizing at the Archaeological Museum of Veria”* contributes to addressing these gaps by offering a practical, evaluated case study that integrates gamification, mythology, UX design, and digital information management within a Greek archaeological museum.

CHAPTER 4 – THE ARCHAEOLOGICAL MUSEUM OF VERIA AND THE MEDUSA THEME

4.1 Overview of the Archaeological Museum of Veria

The Archaeological Museum of Veria stands as one of the most significant cultural institutions in Northern Greece, preserving and interpreting the material heritage of ancient Beroia. Its collections span a broad chronological range (from the Classical and Hellenistic periods to the Roman era) offering a comprehensive view of the region's social, political, and artistic development. Sculptures, inscriptions, funerary monuments, architectural fragments, pottery, and everyday objects collectively illuminate the lived experiences of the ancient inhabitants of Veria.

The Archaeological Museum of Veria was built in the late 50's in the North-East part of Veria, aiming the exhibition and preservation of antiquities from the entire prefecture of Imathia. It was also the administrative seat of the then Ephorate of Antiquities of Western Macedonia until 1974. Today, the exhibition inside the Museum consists of three main rooms. The first exhibits burial finds from the 6th to the 1st cent. BC. from the ancient city of Veria. The second room is dedicated to the public life of the ancient city, including inscriptions and sculptures from the sanctuaries of Veria, as well as public acts, such as the famous Gymnastic Law, inscriptions on slave manumissions from the Hellenistic to Roman Era and Roman pictorial heads. The third room includes mainly tomb reliefs of Hellenistic and Roman times, as well as glass objects, clay figurines and vases from the cemeteries of the ancient city. In the attic of the museum are exhibited antiquities from various places of N. Imathia (N. Nikomedia, Toumpes of Angelochori and Polyplatanos, Lefkopetra, Mieza, Kypseli). The exhibition "Wall of Memory" which is placed in the courtyard of the Museum will be the object of a different game.

The museum's exhibition philosophy reflects contemporary museological principles that prioritize accessibility, narrative coherence, and visitor engagement. Rather than presenting artifacts as isolated objects, the museum situates them within thematic and interpretive frameworks that encourage visitors to understand their cultural, historical, and symbolic significance. Clear interpretive texts, thoughtful spatial organization, and the integration of mythological motifs contribute to a visitor-centered experience that supports both learning and aesthetic appreciation.

In recent years, the museum has demonstrated a growing openness to digital innovation and educational programming. This institutional orientation creates fertile ground for the integration of gamified experiences that can enhance visitor engagement, support informal learning, and expand the museum's interpretive strategies.

4.2 Key Exhibits and Mythological Connections

Although the Archaeological Museum of Veria is primarily archaeological in focus, mythology permeates many of its exhibits. Mythological themes appear in sculptural representations, decorative motifs, funerary art, and symbolic imagery, reflecting the deep entanglement of myth and daily life in antiquity.

Key mythological connections include Sculptures of deities, such as Athena, Hermes, or Dionysus, which reveal religious practices and artistic conventions. Also, architectural fragments adorned with mythological symbols, often serving protective or decorative functions. Thirdly, funerary monuments that incorporate myth-inspired iconography to express themes of transition, protection, or commemoration. Finally, objects of daily life, including pottery and jewelry, decorated with mythological creatures or divine figures. These artifacts demonstrate how mythology functioned as a cultural language, shaping identity, belief systems, and artistic expression. For contemporary visitors, mythological references offer familiar narrative anchors that facilitate interpretation and emotional engagement.

The game *"Mythologizing at the Archaeological Museum of Veria"* draws on these connections by linking specific exhibits to elements of the Medusa myth, encouraging players to observe details, interpret symbols, and situate artifacts within broader cultural narratives.

4.3 The Medusa Bust as Interpretive Anchor

The monumental bust of Medusa, prominently displayed at the entrance of the Archaeological Museum of Veria, serves as a powerful visual and symbolic landmark. Its placement at the museum's threshold creates an immediate encounter with mythological imagery, inviting visitors to reflect on the interplay between myth and material culture.

Medusa is one of the most enduring figures in Greek mythology. Historically, the Gorgoneion, i.e. the head of Medusa, functioned as an apotropaic symbol, believed to ward off evil and protect sacred spaces, homes, and individuals. Its widespread use in

architectural decoration, shields, jewelry, and funerary contexts underscores its cultural significance.

Within the museum context, the Medusa bust functions as a gateway into the mythological imagination of the ancient world, a narrative focal point around which interpretive experiences can be structured, a symbolic bridge between intangible myth and tangible archaeological evidence, and as an emotional stimulus that captures attention and sparks curiosity.

For the purposes of this thesis, Medusa serves as the central narrative axis of the digital game. Her story provides a cohesive thematic thread that guides players through the museum's exhibits, encouraging them to explore connections between mythological symbolism and archaeological material.

4.4 Opportunities for Digital and Gamified Interpretation

The Archaeological Museum of Veria presents a particularly rich environment for the integration of digital and gamified interpretive tools. Several factors contribute to its suitability. One of them is its Rich Narrative Potential, as the museum's collections contain numerous artifacts with mythological associations, offering fertile ground for narrative-driven experiences. Mythology provides a familiar and emotionally resonant framework that can support storytelling, exploration, and interpretive depth. Another factor is the museum's Spatial Coherence and Visitor Flow, as the museum's layout supports structured movement through thematic sections, making it conducive to gamified progression. Visitors can follow a sequence of tasks or challenges that correspond to specific exhibits, enhancing orientation and engagement. A third important factor is the museum's Educational Mission and Community Role. As a regional museum, the institution plays a vital role in local education and cultural identity. Gamification can support this mission by engaging younger audiences, fostering intergenerational learning, supporting school visits, and promoting cultural participation among diverse groups.

Two more factors favoring the Archaeological Museum of Veria are its Digital Readiness and Institutional Openness as well as its Enhancing Visitor Motivation and Memory. The museum's existing interest in digital tools and educational programs provides a supportive context for implementing innovative interpretive strategies.

Gamified applications can complement traditional displays, offering alternative pathways for learning and exploration. Gamification has been shown to increase intrinsic motivation, improve memory retention, and support deeper cognitive processing. In a museum setting, these benefits translate into more attentive observation of artifacts, stronger emotional connections, improved recall of historical and mythological information, and greater overall satisfaction with the visit.

The game *“Mythologizing at the Archaeological Museum of Veria”* leverages these opportunities by transforming the museum visit into an interactive quest. Through narrative progression, mythological clues, and exhibit-based challenges, the game encourages visitors to engage actively with the museum’s collections and experience cultural heritage in a playful yet meaningful way.

CHAPTER 5 – DESIGN AND DEVELOPMENT OF THE DIGITAL GAME “MYTHOLOGIZING AT THE ARCHAEOLOGICAL MUSEUM OF VERIA”

5.1 Conceptual Foundations and Narrative Design

The development of the game *“Mythologizing at the Archaeological Museum of Veria”* was grounded in the recognition that digital, narrative-driven experiences can enrich museum learning by fostering curiosity, emotional engagement, and interpretive depth. The conceptualization phase drew upon contemporary theories of gamification, user experience design, and museum pedagogy, emphasizing the need for a visitor-centered approach that integrates storytelling with archaeological content. The narrative design was inspired by the museum’s monumental Medusa bust, which functions as both a symbolic threshold and a compelling interpretive anchor. Medusa’s myth, rich in themes of transformation, fear, power, and protection, offered a narrative framework capable of guiding visitors through the museum’s collections in a cohesive and meaningful way. The game adopts a quest-based structure, where players progress through stages of the myth, uncover clues, and engage with exhibits that illuminate aspects of Medusa’s story. This narrative approach aligns with research demonstrating that storytelling enhances memory, emotional resonance, and meaning-making in museum contexts. By situating archaeological artifacts within a mythological storyline, the game encourages visitors to perceive the museum not merely as a repository of objects but as a space where cultural narratives unfold.

5.2 Technical Development Using the P4S Platform

The game was developed using the Pact4Skills (P4S) platform, a European digital environment designed to support the creation of interactive educational applications (<https://ivetagr.org/pact4skills/>). The platform’s flexibility, multimedia capabilities, and user-friendly interface made it suitable for rapid prototyping and iterative refinement.

The development process unfolded in the following three plus one stages:

Stage 1. Structuring Content and Narrative Flow: The myth of Medusa was divided into discrete narrative segments, each linked to a specific exhibit or thematic

concept within the museum. This ensured that the game remained grounded in authentic cultural content while maintaining narrative coherence.

Stage 2. Multimedia Integration: High-quality images of museum artifacts were incorporated to support visual learning and enhance authenticity. Although audio narration was considered, platform limitations and user feedback regarding language inconsistencies led to its partial implementation.

Stage 3. Interactive Elements and Game Mechanics: The game integrates a variety of interactive components, including multiple-choice questions, narrative prompts, exhibit-based clues, progress indicators and immediate feedback mechanisms.

These elements were designed to balance challenge and accessibility, supporting both novice visitors and those with prior knowledge of mythology.

The plus one stage. Iterative Testing and Refinement: Throughout development, the game underwent multiple cycles of testing with users of different ages and backgrounds. Feedback informed improvements in language consistency, interface clarity, narrative transitions, and overall usability. This iterative process reflects best practices in user-centered design and digital heritage development.

5.3 Game Structure, Levels, and Challenges

The game *“Mythologizing at the Archaeological Museum of Veria”* is organized into a sequence of levels that correspond to stages in the Medusa myth. Each level includes a narrative introduction, an image of a relevant exhibit, a set of interpretive tasks or questions and immediate feedback. This structure supports self-paced learning, formative assessment, and progressive engagement.

In terms of **challenges**, the game incorporates several challenge types to support diverse learning styles, including knowledge-based questions, assessing understanding of mythological content; observation tasks, requiring close examination of artifact images; interpretive prompts, encouraging connections between myth and archaeology; exploratory missions, guiding players through thematic sections of the museum; user feedback indicated a desire for additional challenge types (such as riddles, branching storylines, or adaptive difficulty), which can inform future iterations.

In the following lines, we examine how the game is played, who its characters are, and what questions it includes.

The starting screen: Mytholog-izing at the Archaeological Museum of Veria

“Take on the challenge of Medusa! Live an exciting experience solving the riddles hidden behind the Museum's exhibits! Choose the character that represents you and...let's play!!!

Our heroes, Leandros, Danae, Electra, and Nikitas, discover an ancient papyrus at the Archaeological Museum of Veria that refers to the myth of Medusa. When the heroes arrive at the museum's entrance, the door opens on its own, and an enchanting mist covers the space. Medusa appears through the mist, with her luminous, phosphorescent snakes in her hair moving gracefully. Her eyes glow with an otherworldly power, and her voice sounds like a whisper of the wind. Medusa explains to them that, in order to uncover the museum's secrets, they must solve a series of riddles and puzzles related to her myth and the exhibits.

Mission: Medusa, in her most terrifying and imposing form, appears before the players with her eyes full of rage and her snakes whispering menacingly. With a voice that echoes like an ancient curse, Medusa addresses them with the following challenge: "Mortals, you dared to enter my sanctuary and disturb my eternal peace. If you wish to survive and claim the Treasure of Knowledge, you must prove your worth. My challenge to you is to overcome the 12 Trials of the Gorgon.". Medusa sets them on a mission: to decipher the riddles and uncover the secrets hidden within the exhibits. By doing so, they will also help her rid herself of the curse that transformed her into an otherworldly monster, for which she is not truly to blame. Throughout the mission, the heroes interact with exhibits that come to life before their very eyes. Statues begin to move, ancient inscriptions shine with glowing letters, and the walls fill with enchanting symbols that constantly change.

Helper: To assist them, Medusa summons the wise Aristotle, who appears with a dazzling aura of light and magic. Aristotle, with his immense wisdom, raises his hand and conjures a choir of ancient spirits that whisper advice and guide the heroes through the riddles and traps. The heroes face magical traps, such as radiant flames springing from the ground and labyrinths made of spectacular symbols. To fulfill their mission, by solving the riddles and uncovering the secrets hidden within the exhibits. By doing so, they will also help Medusa rid herself of the curse that transformed her into an otherworldly monster, for which she is not truly to blame. Upon completing their mission, our heroes will have learned about the myths behind the museum's exhibits, received a personalized Award of Mission Completion, and gained the moral satisfaction

of having helped Medusa regain her former beauty as the stunning young woman she once was.”

The questions that are asked are presented below:

1. Which goddess transformed Medusa into a mermaid with snake hair as punishment? 2. What was the role of the god Olganus in mythology?
3. Who is the Mother Goddess that gave birth to Uranus and Earth, according to Hesiod (Cosmogony/Theogony)?
4. How did Adonis die according to the myth of the goddess Aphrodite and Adonis?
5. What was the reason Zeus kidnapped Ganymede?
6. From which element of nature did the birth of the goddess Aphrodite come?
7. What was the main education provided by high schools according to the High School Law?
8. What was the relationship between the goddess Hygieia and Asclepius in ancient Greek religion?
9. What was the main attribute of the Satyrs in the worship of Dionysus?
10. What is the characteristic of the sword with the image of Victory on display at the Archaeological Museum of Veria?
11. What was the main purpose of offerings in Archaic Period tombs?
12. What gift did the goddess Athena offer the Athenians, thus winning the city from Poseidon?

In the end, when the heroes manage to solve all the riddles and uncover the secrets, Medusa and Aristotle bid them farewell with pride. Medusa raises her hands and creates a dazzling flash that engulfs the entire museum, transforming the space into a magical world filled with glimmers and sparks. A radiant light pours from the top of Medusa’s head, absorbing the negative energy of the curse. Her snakes begin to turn to stone and slowly fall to the ground, replaced by long, wavy hair. Her facial features soften, her eyes shine with kindness, and her powers heal, allowing her inner beauty to emerge. Her entire body glows, surrounded by an august, star-like light, while the spiritual beings of nature dance around her, celebrating the transformation. The sky fills with stars and the wonders of the night, creating an atmosphere full of magic and awe. Now a beautiful young woman, she thanks them and bids them farewell from the Museum.

The players' characters:

Leandros Archontidis is a charming and charismatic art historian, specializing in myths and stories related to ancient exhibits. He was born and raised in Thessaloniki but always had a special love for Veria and its Archaeological Museum. He studied art history and mythology abroad and returned to Greece to continue his research. Leandros is intelligent, observant, and possesses excellent analytical skills. He has a natural ability to recognize hidden meanings in ancient exhibits and solve riddles. He is also very communicative and has a natural politeness that wins people over. He always carries a notebook with notes and sketches of the exhibits, a magnifying glass, and an archaeological map of the area. He also possesses an old family heirloom believed to bring good luck. Leandros is tall, with dark hair and blue eyes. He usually wears a stylish jacket, a blouse, and trousers, paired with comfortable yet elegant shoes.

Danae Lampridou grew up in a family with deep roots in Veria. From a young age, she had a strong interest in the history and legends of the area. She studied archaeology and history in Thessaloniki and returned to her hometown to work at the Archaeological Museum of Veria. There, she found the opportunity to explore and research the secrets hidden within the museum's exhibits. Danae is determined, intelligent, and full of energy. She has exceptional skills in analyzing ancient texts and solving puzzles. She is also very sociable and has the ability to gain the trust of the people she meets. Danae is of medium height, with dark brown hair and large brown eyes. She usually wears a practical jacket, blouse, and pants, along with sturdy boots. She always carries her backpack with her, filled with tools and notes.

Electra is Leandros' niece. From a young age, she showed great interest in history and mythology, encouraged by her uncle. Despite her young age, Electra possesses natural curiosity and a talent for solving puzzles. When Alexandros asked her to assist him in the museum, she enthusiastically agreed. Electra is exceptionally intelligent, with a vivid imagination and creativity. She is determined and doesn't hesitate to face challenges, even when she feels afraid. She also has a natural instinct that often helps her find solutions to difficult puzzles. She always carries a small backpack containing various items, such as a microscope, a notebook, and a flashlight. She also has a small amulet given to her by her uncle, believed to offer protection. Electra is small in stature, with brown hair and expressive brown eyes. She usually wears comfortable clothing to move easily and always carries her favorite hat.

Nikitas is Electra's friend from school. He is curious and loves to explore and learn new things. He always has a question ready and is full of energy. When Electra told him about the riddles in the museum, he eagerly decided to help her with her research. Nikitas is intelligent, creative, and kind. He enjoys using his imagination and is very skilled at thinking outside the box. He is full of curiosity and isn't afraid to try new approaches to solving puzzles. He always carries a small multitool, a notebook filled with sketches and notes, and a flashlight. He also has a small compass given to him by his grandfather, which he considers a valuable aid in his adventures. Nikitas is short, with light brown hair and bright brown eyes. He usually wears comfortable clothes and sports shoes that allow him to move easily.

5.4 User Experience (UX) and Interface Design

User experience was a central consideration throughout the design process. The interface was developed to be visually clear, intuitive, and accessible to diverse audiences. The visual design employs a clean color palette, readable typography, uncluttered screens and prominent display of artifact images. These choices support cognitive clarity and aesthetic engagement. Navigation elements include forward/backward buttons, progress indicators, clear instructions, and consistent screen layouts. User testing revealed the need for improved transitions between narrative and quiz sections, as well as clearer language selection options. Participants identified several areas for improvement: audio narration in both Greek and English, clearer visibility of language selection icons, improved readability for users with visual impairments and differentiated difficulty levels for children and adults. These insights highlight the importance of inclusive design in digital heritage applications.

5.5 Integrating Museum Content with Mythological Narrative

A defining feature of “Mythologizing” is its integration of archaeological content with mythological storytelling. Each task or question is linked to a specific exhibit, encouraging players to observe details they might otherwise overlook, connect artifacts to broader cultural narratives, and understand the symbolic significance of mythological motifs. The Medusa theme serves as a unifying interpretive thread. For example architectural fragments with protective symbols are linked to Medusa’s apotropaic role, funerary monuments evoke themes of transformation and mortality, sculptural representations of deities contextualize Medusa within the wider mythological pantheon.

This approach aligns with contemporary museum education principles that emphasize meaning-making, contextualization, and narrative interpretation.

5.6 Accessibility, Language, and Inclusivity

Accessibility emerged as a significant theme during user evaluation. Participants identified several areas requiring refinement, including language consistency between Greek and English versions, visibility of language selection options at the start of the game, audio narration, particularly for users with visual impairments or auditory learning preferences, and adaptive difficulty, offering different question sets for children and adults.

These insights underscore the importance of designing digital heritage applications that accommodate diverse user needs and learning styles.

CHAPTER 6 – METHODOLOGY FOR THE GAME’S EVALUATION

This chapter relates to the methodology adopted to attempt an evaluation of the game *“Mythologizing at the Archaeological Museum of Veria.”* It is followed by Chapters 7 and 8, where results are presented and discussed.

6.1 Research Design

This study adopts a mixed-methods research design, integrating qualitative and quantitative approaches to investigate the educational impact, usability, and experiential value of the digital game *“Mythologizing at the Archaeological Museum of Veria.”* Mixed-methods research is particularly suited to museum studies, where visitor experience encompasses cognitive, emotional, and behavioral dimensions that cannot be fully captured through a single methodological lens. The qualitative component explores participants’ perceptions, motivations, and interpretive processes through observation and informal interviews. The quantitative component provides descriptive insights into user performance, engagement patterns, and self-reported learning outcomes. Together, these complementary approaches enable a holistic understanding of how gamification shapes visitor interaction with cultural heritage.

6.2 Data Collection Tools

Iterative testing was conducted throughout development to refine narrative flow, interface clarity, question difficulty, language consistency and overall usability. Feedback from early testers informed subsequent revisions, reflecting a user-centered design approach. User testing involved nine participants of diverse ages, professions, and educational backgrounds. Data collection methods included observation, documenting how users navigated the interface, interpreted tasks, and interacted with content; informal interviews, capturing spontaneous reflections, emotional responses, and suggestions for improvement, and informal questionnaires, assessing usability, clarity, engagement, perceived learning, and overall satisfaction. This triangulation of methods strengthened the validity and richness of the findings.

6.3 Sample Description

The sample consisted of nine adult participants, aged 30 to 58, representing a range of professions, including educators, IT specialists, municipal employees, and healthcare professionals. Participants came from Veria, Thessaloniki, Naousa, and Cyprus, offering diverse perspectives on mythology, digital tools, and museum experiences. Although modest in size, the sample is appropriate for exploratory qualitative research and aligns with established practices in museum visitor studies. The diversity of participants allowed for the identification of patterns across different backgrounds and levels of familiarity with mythology.

6.4 Data Analysis Procedures

Data from observations, questionnaires and informal interviews were analyzed using thematic analysis. The process involved transcribing and organizing participant comments, identifying recurring themes, such as narrative engagement, usability issues, or emotional responses, coding responses according to thematic categories, interpreting patterns in relation to the research question and theoretical framework. Finally, emergent themes included appreciation of the narrative and visual material, desire for increased interactivity, concerns about language consistency, and motivation to visit or revisit the museum.

6.5 Ethical Considerations

Ethical principles were upheld throughout the research process. Key considerations included informed consent, as participants were informed about the purpose of the study and agreed to participate voluntarily; anonymity and confidentiality, as personal data were not recorded; participants are referred to by number (e.g., Person No1); respect for participants' time and perspectives, as Interviews were conducted informally and respectfully, ensuring comfort and openness; cultural sensitivity, as the game content was designed to respect the cultural significance of the museum's collections and the mythological material; and non-intrusive observation, as observations were conducted discreetly to avoid influencing participant behavior. These measures ensured that the study adhered to ethical standards appropriate for research in museum and educational contexts.

CHAPTER 7 – EVALUATION AND FINDINGS

7.1 Overview of User Feedback

The evaluation of *“Mythologizing at the Archaeological Museum of Veria”* sought to understand how visitors perceive, interact with, and learn from the gamified experience. Through a combination of observation, informal interviews, and questionnaires, the study gathered rich qualitative and descriptive data from nine participants of diverse ages, professions, and educational backgrounds. Overall, the findings indicate that the game was well-received. Participants described it as engaging, educational, visually appealing, and motivating. They appreciated the integration of mythology with archaeological content and expressed interest in exploring the museum further. At the same time, users identified areas for improvement, particularly regarding language consistency, narrative continuity, and accessibility features.

The following sections present a thematic analysis of the evaluation data, highlighting key patterns in user experience and learning outcomes.

7.2 Thematic Analysis of Informal Interviews

Participants consistently reported positive impressions of the game. Many described it as “interesting,” “pleasant,” and “educational,” noting that it successfully captured their attention and encouraged them to continue playing. Several users expressed enjoyment in revisiting familiar mythological narratives, while others appreciated learning new information.

Representative comments include:

- “It captured my interest to continue.” (Person No4)
- “A very nice and educational knowledge game.” (Person No8)
- “It gives you motivation to visit the museum.” (Person No7)

These responses suggest that the game effectively stimulated curiosity and supported sustained engagement, key indicators of successful gamification.

Participants also praised the visual components of the game, particularly the use of high-quality images of museum exhibits. The visual material was described as “beautiful,” “clear,” and “helpful,” enhancing both aesthetic enjoyment and interpretive

understanding. Users also responded positively to the narrative introduction, which contextualized the game within the Medusa myth. However, several participants noted that the narrative diminished once the quiz section began, e.g. “Once you get to the questions, the story disappears.” (Person No3). This feedback highlights the importance of maintaining narrative continuity throughout the experience to support immersion and emotional engagement.

While participants generally found the interface intuitive and easy to navigate, several usability issues emerged:

- Language inconsistencies between Greek and English versions (Persons No2, No5).
- Audio narration available only in English (Person No5).
- Low visibility of the Greek language flag (Person No2).
- Desire for clearer alignment between images and text (Person No4).

These findings underscore the need for consistent multilingual support and improved accessibility features. Participants offered constructive suggestions for enhancing the game:

- More interactivity, such as riddles or puzzles (Person No6).
- Adaptive difficulty levels, especially for children (Person No7).
- More questions and extended content (Persons No7, No8, No9).
- A concluding narrative or epilogue (Person No3).
- Audio narration in Greek (Person No5).

These suggestions align with contemporary research emphasizing personalization, narrative depth, and multimodal engagement in digital heritage applications.

Participants consistently recognized the educational benefits of the game. They reported learning new information about mythology and gaining a deeper understanding of the museum’s exhibits. Several users noted that the game helped them recall forgotten knowledge or contextualize artifacts more effectively. Examples include:

- “It is useful for someone who hasn’t been to the museum to know what exhibits it has.” (Person No1)
- “You learn things about Greek Mythology.” (Person No8)

- “The small texts give you new information or enrich what you already know.”
(Person No4)

These responses indicate that the game successfully supported informal learning and meaning-making.

7.3 Usability and Engagement Results

The usability findings suggest that the game is generally clear, intuitive, and accessible. Participants described it as “simple,” “easy to use,” and “pleasant.” The certificate awarded at the end of the game was perceived as a motivating reward, reinforcing a sense of accomplishment. Engagement levels were high across participants. Many expressed a desire for additional content, indicating that the game’s short duration was both a strength (maintaining interest) and a limitation (leaving users wanting more). However, specific usability issues, particularly related to language selection, audio narration, and narrative transitions, highlight areas for refinement in future iterations.

7.4 Learning Outcomes and Visitor Experience

Participants demonstrated increased understanding of mythological narratives, symbolic meanings and the cultural context of specific artifacts. The combination of images and short texts was particularly effective in reinforcing knowledge and supporting interpretive depth. In terms of emotional engagement, the mythological theme, especially the Medusa narrative, elicited emotional responses such as curiosity, nostalgia, and excitement. Emotional engagement is a key predictor of memory retention and deeper learning in museum contexts. As far as behavioral engagement is concerned, several participants expressed motivation to visit or revisit the museum, explore additional exhibits or replay the game with different characters (if available). This demonstrates the game’s potential to extend engagement beyond the digital environment and strengthen museum–visitor relationships.

7.5 Identified Issues and Areas for Improvement

The evaluation revealed several areas where the game could be enhanced. Users desired a stronger connection between the introductory story and the quiz sections, as well as a concluding narrative to provide closure. Participants suggested adding riddles,

puzzles, branching storylines, adaptive difficulty levels. These features would enrich gameplay and support diverse learning styles. Improvements needed include consistent Greek/English interface, clearer language selection options, audio narration in both languages, enhanced accessibility for visually impaired users. Many users requested more questions, more exhibits and greater narrative depth. These findings provide valuable guidance for future development and underscore the importance of iterative, user-centered design.

CHAPTER 8 – DISCUSSION

8.1 Interpretation of Findings

The evaluation of *“Mythologizing at the Archaeological Museum of Veria”* demonstrates that gamification can serve as a meaningful interpretive and educational strategy within museum environments. Participants’ responses reveal that the game successfully engaged users cognitively, emotionally, and behaviorally, confirming the relevance of gamification to contemporary museum practice. The findings indicate that the game’s narrative foundation, visual material, and interactive tasks contributed to a positive visitor experience. Users described the game as enjoyable, informative, and motivating, suggesting that the integration of mythology with archaeological content enhanced both comprehension and emotional resonance. At the same time, participants identified areas for improvement (particularly regarding narrative continuity, language consistency, and accessibility), highlighting the importance of iterative, user-centered design.

Overall, the results affirm that gamification can enrich museum learning by fostering curiosity, supporting meaning-making, and encouraging deeper engagement with cultural heritage.

8.2 Contribution to Museum Education and Digital Heritage

This study contributes to museum education and digital cultural heritage in several significant ways. Specifically:

Enhancing Informal Learning. Participants reported learning new information about mythology and gaining a clearer understanding of the museum’s exhibits. The combination of narrative, imagery, and interactive tasks supported informal learning by enabling visitors to construct meaning through exploration and reflection. This aligns with Falk and Dierking’s model of museum experience [FD13], which emphasizes the interplay of personal, sociocultural, and physical contexts.

Strengthening Visitor-Exhibit Interaction. The game encouraged users to observe artifacts more closely and connect them to broader mythological narratives. This demonstrates the potential of digital tools to mediate interpretation and deepen engagement with material culture. The findings support existing scholarship that

highlights the value of digital media in enhancing visitor experience and supporting interpretive depth [Hoo07, RPS17].

Supporting Narrative Interpretation. The Medusa myth provided a cohesive narrative framework that guided visitors through the museum's collections. Mythology functioned as a bridge between intangible cultural narratives and tangible archaeological evidence, enabling visitors to engage emotionally and intellectually with the exhibits. This confirms the interpretive power of storytelling in museums [Bux11].

Promoting Accessibility and Inclusivity. Although participants identified areas for improvement, the game demonstrated the potential of digital tools to make museum content more accessible to diverse audiences. Gamification can support visitors with different learning styles, backgrounds, and levels of familiarity with cultural heritage.

8.3 Alignment with the Theoretical Framework

The findings align closely with the theoretical principles outlined in Chapter 2. Specifically:

Gamification Theory. The game's design reflects contemporary gamification models that emphasize intrinsic motivation, narrative immersion, and emotional engagement. Participants' enjoyment and sustained interest suggest that the game supported autonomy, competence, and relatedness—core psychological needs identified by Self-Determination Theory.

Museum Education and Digital Interpretation. The game embodies the shift toward participatory, interactive museum experiences. By transforming the museum visit into a quest, *"Mythologizing"* aligns with research emphasizing the role of digital tools in enhancing engagement and supporting multimodal learning [Eco15, MCB+14].

Visitor Engagement. The multidimensional engagement observed in the evaluation confirms the relevance of visitor engagement frameworks. The game encouraged active participation, curiosity, and reflection, demonstrating the effectiveness of gamification in supporting holistic visitor experiences.

Mythology and Narrative. The Medusa narrative functioned as an interpretive anchor, supporting emotional resonance and meaning-making. This aligns with scholarship on the educational power of mythology and narrative in cultural heritage contexts [Bux11].

8.4 Implications for Gamification in Cultural Institutions

The study offers several broader implications for museums and cultural institutions interested in adopting gamified approaches. Participants emphasized the need for a more consistent narrative throughout the game. This highlights the importance of maintaining narrative flow to sustain immersion, which is a key factor in effective gamification. User feedback revealed the value of differentiated difficulty levels, multilingual consistency, audio narration and accessible interface design.

These insights underscore the need for inclusive, user-centered design in digital heritage applications. Many participants expressed a desire for more questions, more interactivity, and greater narrative depth. This suggests that gamified applications can support extended engagement, encouraging visitors to spend more time exploring museum content. The game motivated several participants to visit or revisit the museum, demonstrating the potential of digital tools to strengthen community engagement and cultural participation. The development process highlighted the importance of accurate metadata, consistent content management, and sustainable digital infrastructures – key concerns in digital information management [Con10, Gil16].

CHAPTER 9 – CONCLUSIONS AND RECOMMENDATIONS

9.1 Summary of Key Findings

This thesis examined the potential of gamification as an interpretive and educational strategy within museum environments, focusing on the design, development, and evaluation of the digital game *“Mythologizing at the Archaeological Museum of Veria.”* Drawing on interdisciplinary perspectives from gamification theory, museum education, digital cultural heritage, user experience design, and narrative studies, the research demonstrated that gamified applications can meaningfully enhance visitor engagement and support informal learning.

The findings indicate that gamification fosters multidimensional engagement, including cognitive, emotional, and behavioral dimensions. Mythology serves as an effective narrative framework, enabling visitors to connect archaeological artifacts with broader cultural meanings. Digital tools can enrich museum interpretation, making content more accessible, memorable, and enjoyable. Visitors responded positively to the game’s visual material, narrative introduction, and educational value. Usability issues, particularly regarding language consistency, narrative continuity, and accessibility, highlight the need for iterative refinement. Participants expressed motivation to visit or revisit the museum, demonstrating the game’s potential to strengthen museum–community relationships.

Overall, the study confirms that gamification can serve as a powerful pedagogical tool in cultural institutions, offering meaningful, narrative-driven, and interactive experiences that bridge mythology and material culture.

9.2 Recommendations for the Archaeological Museum of Veria

Based on the findings, several recommendations can support the museum’s ongoing efforts to integrate digital and gamified experiences. The museum could develop additional digital tools—such as augmented reality experiences, interactive kiosks, or mobile guides—to complement the game and enhance visitor engagement. The game can be incorporated into school visits, guided tours, family programs and thematic workshops. Moreover, ensuring consistent Greek and English language support would make the game more inclusive for both local and international visitors. This would support active learning and broaden the museum’s educational offerings.

The game can function not only inside the museum but also as a pre-visit orientation tool, a post-visit reinforcement activity or an outreach resource for schools and community groups. This would extend the museum's educational impact beyond its physical space.

9.3 Recommendations for Future Game Development

The evaluation revealed several opportunities for enhancing the digital game *"Mythologizing at the Archaeological Museum of Veria."* in future iterations, including strengthening narrative continuity, by maintaining the Medusa storyline throughout the game, and adding a concluding epilogue, to achieve deeper immersion and emotional engagement; increase interactivity and challenge variety, as participants expressed interest in riddles, puzzles, branching storylines, adaptive difficulty levels; improve accessibility features with future versions to include audio narration in multiple languages, clearer language selection options, improved readability for visually impaired users, and inclusive design principles; adding more questions, exhibits, and narrative segments would satisfy users who desired a longer, more comprehensive experience; and personalize the experience by offering differentiated content for children and adults.

9.4 Suggestions for Further Research and a final comment

The development and evaluation of *"Mythologizing at the Archaeological Museum of Veria"* (https://ivetagr.org/p4s_/) demonstrate that gamification can meaningfully enrich museum experiences by combining narrative, interactivity, and cultural content. The Medusa myth, deeply rooted in Greek cultural identity, proved to be a powerful interpretive anchor that supported both emotional engagement and cognitive learning.

This study opens several avenues for future research in digital cultural heritage and museum gamification, including studies on learning outcomes, comparative studies across museums, research on mythology-based gamification, integration of emerging technologies (e.g. AR, VR, AI, location-based technologies), and user-experience research with diverse audiences.

By integrating digital innovation with archaeological heritage, this study contributes to the evolving field of museum education and highlights the transformative potential of gamification in cultural institutions. The findings underscore the importance of user-

centered design, narrative coherence, and accessibility, principles that will continue to shape the future of digital cultural heritage.

References

- [AML+09] E. F. Anderson, L. McLoughlin, F. Liarokapis, C. Peters, P. Petridis, S. de Freitas. *Serious games in cultural heritage*. Proceedings of the 10th International Symposium on Virtual Reality, Archaeology and Cultural Heritage, 29–48, 2009.
- [Bac16] M. Baca. *Introduction to metadata* (3rd ed.). Getty Publications, 2016. <https://www.getty.edu/publications/intrometadata/>
- [Bux11] R. Buxton. *The Complete World of Greek Mythology*. Thames & Hudson, 2011.
- [Con10] P. Conway. Preservation in the age of Google: Digitization, digital preservation, and dilemmas. *The Library Quarterly*, 80(1), 61–79, 2010. <https://doi.org/10.1086/648463>
- [DDK+11] S. Deterding, D. Dixon, R. Khaled, L. Nacke. From Game Design Elements to Gamefulness: Defining “Gamification.” Proceedings of the 15th International Academic MindTrek Conference, 9–15, 2011. <https://doi.org/10.1145/2181037.2181040>
- [DR00] E. L. Deci, R. M. Ryan. The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268, 2000. https://doi.org/10.1207/S15327965PLI1104_01
- [Eco15] M. Economou. Heritage in the digital age. In E. Waterton & S. Watson (Eds.), *The Palgrave handbook of contemporary heritage research* (pp. 215–233). Palgrave Macmillan, 2015.
- [FD13] J. H. Falk, L. D. Dierking. *The museum experience revisited*. Routledge, 2013.
- [Gil16] A. Gilliland. Setting the stage. In M. Baca (Ed.), *Introduction to metadata* (pp. 1–20), 2016. Getty Publications.
- [HKS14] J. Hamari, J. Koivisto, H. Sarsa. Does gamification work?-a literature review of empirical studies on gamification. *2014 47th Hawaii international conference on system sciences*. IEEE, (pp. 3025-3034), 2014.
- [Has10] M. Hassenzahl. *Experience design: Technology for all the right reasons*. Morgan & Claypool, 2010.
- [Hei98] G. Hein. *Learning in the museum*. Routledge, 1998.

- [Hoo07] E. Hooper-Greenhill. *Museums and education: Purpose, pedagogy, performance*. Routledge, 2007.
- [Kap12] K. M. Kapp. *The gamification of learning and instruction*. Pfeiffer, 2012.
- [Mar08] P. Marty. Museum websites and museum visitors: Digital museum resources and their use. *Museum Management and Curatorship*, 23(1), 81–99, 2008. <https://doi.org/10.1080/09647770701865410>
- [MC06] D. Michael, S. Chen. *Serious games: Games that educate, train, and inform*. Thomson, 2006.
- [MCB+14] M. Mortara, C. E. Catalano, F. Bellotti, G. Fiucci, M., Houry-Panchetti, P. Petridis. Learning cultural heritage by serious games. *Journal of Cultural Heritage*, 15(3), 318–325, 2014.
- [Nor13] D.A. Norman. *The Design of Everyday Things*. New York: Basic Books, 2013.
- [RPS17] M. Roussou, F. Ripanti, K. Servi. Engaging Visitors of Archaeological Sites through “EMOTIVE” Storytelling Experiences: A Pilot at the Ancient Agora of Athens. *Journal of Archeologia e Calcolatori*, 28(2), 405–420, 2017
- [SF15] K. Seaborn, D. Fels. Gamification in theory and action: A survey. *International Journal of human-computer studies*, 74, 14–31, 2015.
- [SS23] E. Stylianidis, S. Sylaiou. (ed.) *Τεκμηρίωση και Ανάδειξη πολιτισμού, Θεσσαλονίκη*, εκδ. Τζόλας, 2023. (in Greek, ISBN: 978-960-418-494-1).
- [SPC+16] B. Shneiderman, C. Plaisant, M. Cohen, S. Jacobs, N. Elmquist, N. Diakopoulos. *Designing the user interface: Strategies for effective human-computer interaction* (6th ed.). Pearson, 2016.
- [ZS24] N. Zeybek, E. Saygı. Gamification in education: Why, where, when, and how? – A systematic review. *Games and Culture*, 19(2), 237–264, 2024.
- [ZC11] G. Zichermann, C. Cunningham. *Gamification by design: Implementing game mechanics in web and mobile apps*. O’Reilly, 2011.

Appendix A: The Game's Intro Screen

