

**Article:** Designing Stories from the Grave: Reviving the History of a City through Human Remains and Serious Games

**Authors:** Tsaknaki, Electra; Anastasovitis, Eleftherios; Georgiou, Georgia; Alagialoglou, Kleopatra; Mavrokostidou, Maria; Kartsiakli, Vasiliki; Aidonis, Asterios; Protopsalti, Tania; Nikolopoulos, Spiros; Kompatsiaris, Ioannis

**Peer Review by:** Tine Rassalle

**Date:** 06/07/2023

### **Article Summary:**

This article provides a comprehensive overview of the ECHOES project, which has been partially conducted by the authors. The primary objective of this endeavor is to develop an augmented reality/virtual reality (AR/VR) gamified experience centered around the history and archaeology of Thessaloniki, Greece. The project's ultimate aim is to educate the general audience about the city's history in an engaging and immersive manner, while incorporating user feedback for continual improvement.

### **Strengths:**

- The authors present a compelling argument for the utilization of AR/VR technologies as a means to generate interest among the general audience in the history of Thessaloniki. They highlight how incorporating gamification elements within these technologies can effectively captivate and maintain users' attention. This approach offers an innovative and engaging way to educate and immerse individuals in the historical narrative of the city.
- The sections detailing the technologies employed in the project, specifically 3.2.1 AR environments, 4.2.1 Virtual Reality, and 4.2.2 Augmented Reality, demonstrate thorough research and clarity in presentation. These segments effectively convey all the necessary information for readers to comprehend the arguments and discussions put forth in the article.
- The authors explain the 4 different steps of the project in an effective way. By presenting a detailed account of the project's development, the authors offer valuable insights into the process and considerations involved in creating an educational AR/VR experience.

### **Weaknesses:**

- There are multiple areas in which the article is confusing, or lacks information for the reader to understand the project fully. Here are some pieces of information that I was missing:

- o What is ECHOES? What does it stand for? What is the aim of ECHOES in general? How, when, and why did this project come to be?
  - o What is the relationship of the authors to the ECHOES project? Are all of them active members and creators? What are their roles?
  - o Where did funding for this project come from and why was it awarded (besides the information that is mentioned in the Acknowledgements)?
  - o What is the background of this project? How did it emerge? Why was Thessaloniki chosen? Why now?
  - o What are Serious Games? Can you provide well-known examples? Can you provide citations for this topic? What is "SG's Theory" (line 110)?
- One aspect of the article that may generate confusion pertains to the mention of the ethics surrounding the display of human remains. This theme is introduced at the beginning and end of the article (and is even in the title!), but it is not mentioned in the summary, nor further explored within the main body. Consequently, it remains unclear whether the AR/VR experience showcases human remains and, if so, whether this is considered a preferable alternative to viewing actual deceased bodies. Moreover, it remains uncertain whether this technology resolves the ongoing ethical debate surrounding the public display of human remains. It would have been beneficial to ascertain if these inquiries were included in the questionnaire and whether users indeed perceive this as a viable substitute for encountering mummified remains within a museum setting. Additionally, it would be pertinent to clarify which bodies are depicted in the AR/VR experience (will they be in the tomb?), and elucidate the source of these bodies. Given that the opening statement of the article raises this matter, and the title states that the experience is built upon human remains, one would anticipate an in-depth examination of this topic within the article itself.
- Another aspect of this article that may cause confusion is the inconsistent use of verb tenses. It is understandable that this issue may arise due to the authors being non-native English speakers. However, the varying verb tenses obscure the current status of the project for the reader. For instance, in line 105, the phrase "the proposed methodology" suggests that the project has not yet commenced, whereas line 107 states that "the questionnaire was distributed," indicating that this step has already been completed. Furthermore, line 165 implies that "the environment would be created," raising uncertainty as to whether step 3 has yet to begin or may potentially be omitted altogether.
- To address this concern, it is advisable to enlist the assistance of a native English speaker to edit the article, ensuring the coherent use of verb tenses throughout. Additionally, incorporating specific dates throughout the article would serve to provide clarity to the reader regarding the timeline of each step, whether completed or pending. By implementing these suggestions, the article can become more accessible and comprehensible to a wider audience.

- Regarding the AR/VR experience described in the article, there is a need for clarification regarding the correlation between these two elements. It remains unclear how and when the transition occurs from the AR guided tour experience to the more immersive VR detailed experience. Specifically, the mention of the initial VR experience taking place inside a modern subway cart raises questions about the visualization and context of this scenario. Further elaboration on this aspect would be helpful to enhance understanding. In addition, it is also not clear exactly how many VR experiences there will be. Chapter 3.2.2 mentions "six unique environments," while chapter 4.1 only mentions four. Where did the tomb go? Is the first experience the subway cart or the port?  
Another point of confusion arises from the mention of the "five levels of information method" (lines 170-171). The article lacks clarity regarding the specific objective of this method and the rationale behind the selection of five steps. It would be beneficial to provide a clearer explanation of the intended purpose of this approach and whether users are expected to progress through these steps in a particular order within each environment. If not, it may be advisable to consider alternative terminology, such as "five areas," to avoid implying a strict sequence.  
By addressing these uncertainties and providing additional details, the article can offer a more comprehensive understanding of the AR/VR experience, ensuring that readers have a clear and coherent grasp of the project's implementation and structure.
- Lastly, it is recommended to consider relocating Chapter 5, titled "Discussion," to the Introduction section of the article. This adjustment would contribute to enhancing the reader's comprehension by providing background information on the technology employed in the project. By moving this chapter to the Introduction, readers would gain a clearer understanding of the historical context (Perhaps also add previous applications of similar technologies in other projects). Furthermore, it would elucidate why experiences like the one presented in the article have not been developed until now and highlight the significance of the current timing in pursuing such endeavors.

#### **Smaller or specific remarks:**

- When enlisting the expertise of a native English speaker to edit the article, it would be beneficial to prioritize their attention to the appropriate usage of adverbs and transitional words. For instance, the term "moreover" is frequently employed to introduce a new topic, whereas its conventional usage implies a continuation of the same topic. Additionally, inconsistencies arise regarding the capitalization of certain terms such as "Virtual Museums," "Cultural Heritage," and "Immersive Technologies," while other terms remain uncapitalized. It would be worthwhile to elucidate the reasoning behind these discrepancies and ensure consistent capitalization conventions throughout the article.
- Refrain from using "him/her": instead, use the gender-neutral "they".

- In lines 191-193, the article discusses the utility of questionnaires and interviews for capturing knowledge within a research project, accompanied by a citation. While the inclusion of this information may appear redundant as it is commonly known, it is worth noting that providing a citation adds credibility to the statement. However, it is understandable that readers then might expect citations for more significant statements as well, such as the history of *Serious Games* or the term *Metaverse*, which are of greater relevance to the article's subject matter. For examples, lines 301-308 talk about the importance of gamification to enhance user engagement, but here no studies or citations are provided. To maintain consistency and ensure proper emphasis, it is recommended to allocate citations proportionally to the significance of the statements made throughout the article. By providing appropriate citations for essential concepts and ideas, readers can confidently rely on the sources cited and gain a deeper understanding of the relevant background information.
- Regrettably, the article lacks a URL or hyperlink directing readers to the project's website, which would have provided valuable supplementary information. Including such a reference would have allowed readers to access additional resources, explore further examples beyond Figure 1, and gain a more comprehensive understanding of the project's progress and outcomes. Moreover, the absence of the questionnaires used and the specific questions posed to users prevents readers from accessing detailed insights into the methodology and data collection process. Being able to examine the questionnaires would have provided transparency and allowed for a more thorough evaluation of the study's methodology and results.