

Interactive comment on “Earth Girl Volcano: Characterizing and Conveying Volcanic Hazard Complexity in an Interactive Casual Game of Disaster Preparedness and Response” by Isaac Kerlow et al.

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Dear Reviewer #2,

Thank you for taking the time to read the manuscript and provide feedback.

We have numbered your comments and our replies for ease of tracking.

Thank you again,

The authors

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REVIEWER 1 - The authors should take care to adjust any possibly marketing-like language, which is inappropriate, and replace it with factual language. A publication in this journal should not so much evoke emotions, which is the domain of marketing, but convincingly document the scope, methods, results, and lessons learned.

AUTHORS 1 - The manuscript documents interdisciplinary work that involves art and science. Emotions are the basis of storytelling and artistic creation, which are at the core of this game. The game incorporates notions of Earth science and evacuation management, but the game itself is not a scientific project nor an emergency evacuation manual. The game is the result of interdisciplinary artistic and scientific collaboration and because of that we use language that is used to describe artistic methods and techniques. Marketing on the other hand is oftentimes based on partial truths that may create a false impression of things, there is no intention to mislead or anything misleading about this game. We will remove any language that may sound like marketing. Any specific recommendations would be appreciated.

REVIEWER 2 - Otherwise, the language used makes the paper read fluently. It appears to be very long, though I didn't check the word count vs. the journal's recommendations.

AUTHORS 2 - At 22 pages the manuscript is a few pages beyond the 15-pp. MINIMUM length specified by the special issue guidelines.

REVIEWER 3 - The abstract may benefit from framing it more in a communication theory context, which could be easily solved with careful wording choices and better structuring.

AUTHORS 3 - We choose to focus the abstract not only on the storytelling method, but also on key aspects about game design and implementation of preparedness and response concepts in the game mechanics. Following the reviewer suggestion we can include some specific terminology to make more clear the importance of "storytelling" as a powerful communication method.

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REVIEWER 4 - The manuscript structure could be significantly improved by better header hierarchy to provide a more structured and easier to follow logic, and by providing brief introductions. For instance, it is unclear where the context introduction ends and the methods section begin.

AUTHORS 4 - We believe that the manuscript follows the header nomenclature suggested by the journal. Section 1, Introduction, includes introductory notes on both context and method (divided in sections 1.1 to 1.7). The subsequent sections focus primarily on the different methods used in each of the story acts (one manuscript section per story act). As a possibility we could group the story acts under one single section and include a brief introductory paragraph as suggested by the reviewer in comment 6.

REVIEWER 5 - I suggest to add a table of user testing statistics, if available, since this is an important foundation to the resilience and impact of the final product. It could also be a pie chart, bar chart, or similar, and should be referred to in the text at the appropriate sections.

AUTHORS 5 - Even though quantitative data would add value to the manuscript, detailed testing statistics are beyond the scope of this specific manuscript.

REVIEWER 6 - Section 2 will need a paragraph or so of introduction of the following sections. I suggest to number start with a preamble providing a brief description of the sections that follow (no more than one sentence or bullet per section) and call it #2. Call "Act one" #2.1 (levels of difficult, #2.1.1); call "Act 2" 2.2, and so forth. Of course, if my earlier comment on methods is taken into account, these all change to 3, 3.1, 3.2, etc.

AUTHORS 6 - It is unclear why further subsection introductions would be necessary within current Section 2 since the section is short and topics are already contextualized. We prefer to have a separate section for each Act in the story as each one of them

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follows a unique approach, quite different from the others. Consolidating all the acts in a single section would dilute the clarity of the story analysis. Each act functions as a different moment in the overall process of preparedness and response, and we mean to make this obvious by analyzing each of the acts in a separate manuscript section.

REVIEWER 7 - Section 5 is focused on behavioral and psychological methods to communicate functional relationships and provide a learning experience feedback component. I suggest to expand on the preamble of this section in a communication theory introduction of game engagement and education state-of-the-art knowledge from the relevant literature. The following subsections 5.1 through 5.3 could be listed as bullets in this preamble and given appropriate context.

AUTHORS 7 - Section 5 is focused on storytelling, game design and game mechanic techniques used to characterize situations of preparedness and response. Further expansion on additional behavioral and psychological issues is beyond the scope of this paper.

REVIEWER 8 - Section 5.1 "Rules of Thumb" as a title phrase is based on a European/American language-centric idiom, and I suggest to use different language (or define "rules of thumb" in the beginning). There is more technical language that could be used to describe these relationships described in Sect. 5.1, like process feedbacks, functional relationship, etc., per their technical definitions. The author should recall that the audience here is not the game audience.

AUTHORS 8 - We will consider more precise terms to describe the ideas presented in subsection 5.1. We will find a better way to address "Rules of Thumb"? We realize that the readers of the paper will not be primarily the game audience but we recognize a great value in exposing Earth scientists to effective game design methods and game terminology. Familiarity with game terminology and methodology may help Earth scientists to become more effective collaborators in interdisciplinary projects that involve gaming. Because this manuscript was submitted to an interdisciplinary special issue

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we expect a wide variety of readers, including artists who are looking for reasons and encouragement to collaborate with Earth scientists.

REVIEWER 9 - Section 5.4 - it is not obvious to me why this shouldn't be part of the methods section in the beginning.

AUTHORS 9 - Simulation and scripting are two opposing gaming techniques rarely used together in a science-inspired game to yield a convincing gameplay experience. We use both simulation and scripting techniques to characterize volcanic hazard complexity, and Section 5 consolidates all the characterization techniques used in the game. For added clarity we present this section after the structure analysis of the three different acts in the game.

REVIEWER 10 - The Conclusions appear to lack context from the game engagement/education communication literature, which I am not familiar with. It also lacks a communication-focused impacts summary (how does this science engagement/education game impact society and behavior, or how is it projected to do so?).

AUTHORS 10 - We will develop the impacts, we will improve the Conclusion in the context of game-design and game process (how does this game innovate in terms of characterizing natural hazards? What lessons were learned to improve an interdisciplinary collaboration?)

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