

## ***Interactive comment on “Using video games for volcanic hazard education and communication” by L. Mani et al.***

### **Anonymous Referee #3**

Received and published: 24 February 2016

Initial paragraph: This paper describes the steps to development of a computer-based game intended to “improve knowledge of future potential volcanic hazards on St. Vincent, and to integrate traditional methods of education in a more interactive manner.” The work described is worthy; in the article it simply needs to be described as a work in progress so as not to mislead the reader. Additionally, methods for evaluation could be more thoroughly stated, and the authors should indicate how future game updates and implementation will be made and how the game will be integrated and sustained long-term in the education community. One systemic issue exists: the measuring of increased awareness (as opposed to possibly more easily measured ‘preparedness’) is problematic because it offers a lack of easily measurable variables. All that said, this is a commendable effort and descriptions of it in an article are worthy of publication with major modifications. This study adds to the long list of well-intended ventures that

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face similar challenges.

Overall evaluation: The idea of using video games is a reasonable, if not trending approach to hazards education. As authors note in the Introduction, for the global hazards-education community, there is insufficient quantitative information available about the value of video games relative to other outreach methodologies. This study and paper have the potential to provide just that. The study and this paper serve as a caution for others considering similar ventures. Owing to a variety of unanticipated obstacles encountered in the video game development and implementation processes, this paper falls short in providing meaningful results. While the word 'preliminary' is used near the end of the Abstract, the reader must read most of the paper before truly recognizing that video game development and implementation are works in progress.

This reviewer hopes that the malfunctioning of analytic software, necessary tossing of much data owing to systemic student cheating, and other challenges encountered are not roadblocks, but valuable information for consideration during game upgrades and implementation during the future Volcano Awareness Weeks. Raising awareness and levels of preparedness are long-term propositions. This is simply round one. In that sense, the paper should be revised to (1) reflect from the start that this is a report of a work in progress; and (2) couch the statement of problems encountered as a lessons learned, and with recommendations for how they will fix these issues for the next round. Readers who are contemplating similar ventures will welcome a paragraph about 'lessons learned', and recommendations for the development and implementation processes. A change in title that reflects the 'in progress' and 'lessons learned' aspects would provide potential readers with a more accurate description of content; it would enhance and not detract from the article's value.

Readers would also welcome a broader description of the role of the video game in VAW, how they are creating long-term buy-in by educators, and plans for sustaining and upgrading the video game product over time.



Scientific comments (specific) In the Introduction and Previous Research sections, the authors include a helpful overview of the potential value of educational tools in the raising of awareness about hazards, and the need for products which are targeted for specific audiences. It explains well the value of targeting students in the larger quest to reach their families. There is an omission here that must be noted—that some of the same authors—Johnston and Paton in particular, note also in their professional publications that awareness does not equal preparedness, and that there is a cultural filter, and a series of mental steps through which information must progress before tangible results—preparedness—are achieved. This concept needs to be acknowledged more specifically within the text.

The experiment design makes full analysis unachievable—quantitatively—and in some ways qualitatively. The study objectives are noted, but defining and then working towards a tangible ‘desired outcome’ would have made success easier to measure. For example, authors could arrange for verification of the family creating a family emergency communication card, adding prescribed general items to an emergency kit, and adding an evacuation map/instructions to this kit.

Regardless of the lack of sufficient quantitative and qualitative assessments presented in this paper, there is still hope that the same verification processes can be accomplished for each future VAW event. Perhaps adjustments can be made by creating some tangible measures. The user can return to the same group year after year during Volcano Awareness Week and with an improved quantitative tool, and can still make those assessments. After all, raising awareness is broadly acknowledged as a long-term proposition, with one year serving as a first point in the data series.

Comments specific with a listing (by page and line) of technical questions. Page 1 Line 23—This is very preliminary data. Line 18 speaks of ‘final implementation’; 23 calls it preliminary data. Throughout the Results there is reference to this being a work in progress. That should be noted in the abstract. Page 1 Line 37—remove extra semicolon. Page 3 Line 100—For others considering similar ventures, there would

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be value in a brief description of the characteristics common of successful games. What are they? Which of the common characteristics that are shared with other products aimed at youth and adults, such as hazards-related educational comic books (also enjoying some popularity), creative play such as play-acting theatrical productions about hazards-preparedness-positive outcomes, school projects, etc. Page 5 Line 201—Readers need additional information about technical improvements to be made. Page 5 Line 210—It is impossible for the reader to analyze results without having the questions included. Page 7 Lines 300-325—It would be useful for the reader to learn more about the surrounding educational environment. For example, beyond the VAW outreach team efforts, did students receive any other volcano-related training in their school? See also comments in Overall Evaluation. Page 9 Line 380—Say up front that this is preliminary only. See also comments in Overall Evaluation. Page 10 Line 471—The high percentage of data sets removed serves as an indicator of where techniques for implementation should be modified in future efforts. This is valuable data; implementation during one VAW is simply is the first step. State how you will upgrade the game’s analytics and implementation procedures in the future. Give guidance to readers who might attempt similar ventures. Page 11 Line 503—This statement about “Initial findings. . .” seems expectable, but I am searching for the analysis on which it is based. Please provide more information. Page 11 Line 518—There would be value in placing these aims much earlier in the paper. Figure 5—Correct the Explanation Box so that it shows the Adult Average as a blue triangle rather than square.

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