

Geosci. Commun. Discuss., referee comment RC1
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Comment on gc-2021-17

Anonymous Referee #1

Referee comment on "Virtual field experiences in a web-based video game environment: open-ended examples of existing and fictional field sites" by Mattathias D. Needle et al., Geosci. Commun. Discuss., <https://doi.org/10.5194/gc-2021-17-RC1>, 2021

Overview and General Recommendation:

Needle et al. describe two new and exciting virtual geology field experiences and share one of them with the larger earth science community. However, the authors do not present any geologic or education data or results within this contribution, thus I do not feel this contribution qualifies as a Research Article per the Geoscience Communication Review Criteria. The contribution primarily serves as a report on the sites they created and how they chose to implement them in the classroom. However, it is an important resource contribution to the geoscience community and should be published.

The field trips include one real world site, the Whaleback anticline in Central Pennsylvania, recreated digitally using structure-from-motion photogrammetry and one fictional location created using Blender, an open-source 3D creation platform. Both field sites were designed in Unity, a platform that allows the user to build 2D, 3D, and VR games. The Whaleback anticline field site "video game" is publicly available for community use on a free video-game hosting platform – web links are available via the website virtualfieldgeology.com, which is run by the authors.

These are useful tools to supplement, replace, and/or enhance traditional geoscience field education. Virtual field trips (VFTs) provide improved access for students and may ultimately alleviate some barriers associated with field excursions. I suspect geoscience instructors will greatly benefit from using the two VFTs created and described by the authors. The authors leave the goals and activities associated with the VFTs open-ended to allow other instructors to make use of the field sites as they see fit. I recommend the manuscript be published with minor revision and with recognition that it is not a research article.

The contribution has two primary weaknesses. First, the authors do not present any quantitative or evaluative data from their pilot VFT implementations at the University of Washington. As such I cannot assess 1) student engagement, 2) if students acquired and accomplished the associated field skills and learning goals, or 3) how student learning gains compare to traditional field experiences. I recognize that this falls into the category of discipline-based education research with human research subjects. As such, to collect and report much of the data I request the authors would need Institutional Review Board approval. I encourage the authors to carefully consider how to assess the success of their

VFTs in the future, I'd be very interested in those results!

Second, the authors do not provide sufficient workflow or technical information regarding how they built their VFTs to be useful for others to follow their approach. The manuscript would benefit from a workflow figure and detailed steps for others to create VFTs, as this seems to be the primary purpose of their contribution. At present the manuscript is simply a description of the sites they built.

The authors have provided neat tools for the community, but their contribution to GC serves only to share and describe the tools they created as opposed to presenting information and data assessing the tools or a more detailed approach to building the tools. I think both would substantially improve the utility of the contribution.

Specific Comments:

Lines 58-59: The manuscript would benefit from additional references of geoscience education research to support several claims. References here would help.

Line 120: Do you have user results from the July 2020 pilot study to report?

Line 139: How do you measure user experience such as "Most students found the game controls to be intuitive"?

Line 216: Do you have any user results beyond anecdotal accounts?

Line 224: Can you elaborate on high-quality work? How was this assessed?

Lines 258-264: I only caution the authors to consider that fictional environments could be abused by instructors. If a major goal of using VFTs is to accessibly acquire and practice field skills, then the VFTs should be geologically reasonable and possible.

Line 266: I look forward to this template contribution – this will be excellent for the geoscience community!