# Review of: "Visual Science Communication: The next generation scientific poster"

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**Potential competing interests:** No potential competing interests to declare.

[Let me start by stating that this article is not in my primary area of expertise.  I am primarily an educational researcher who works with design thinking in higher education, so this review should be taken as coming from the perspective of an interested outsider.]

The article makes a case for enhancing the visual impact of scientific posters using a particular model of interactive poster design.  I found the model itself to be clear and compelling, with a number of potentially useful applications. I was especially appreciative of the explanations of the process through which they designed the example(s) provided. One important caveat  is that the proposed design assumes that the scientists in question will have access to rather sophisticated, and often expensive, hardware and software tools to be able to design and develop such interactive posters.  This is not the case for all institutions in all parts of the world, which may be a critical limitation to the generalizability of their process.

The case made for the use of the model (Section 1) was not as compelling as the model itself.  As other reviewers have noted, the authors have some tendency to argue by assertion.  For example, even on the first page they assert that visual literacy is assumed but not taught.  This is an assertion, and a broad one at that.  Not taught anywhere? To anyone?  At my current university, for example, we *do* teach undergraduate STEM students basic visual literacy when they design posters for our student research exhibitions.  At my previous university, the Biology department had courses on scientific communication (at both the graduate and undergraduate level) that included attention to visualizations.  In a quick search of the literature, I found several studies referring to data visualization courses developed specifically for STEM majors at multiple levels.  Similarly, what is the basis for claims such as this one: "for many scientists, the advantages of eloquent science communication are also becoming increasingly clear"?  Most scientists I know would state that they have long believed in these advantages.

I think part of the issue is the very broad framing applied here.  My suggestion would be to strengthen the focus of this section  and to integrate more of the scholarly literature on scientific communication, especially from the STEAM literature, where the topic appears prominently, and to focus on the poster in particular.  As it stands, the review of the literature does not appear systematic, but reads (at times) as if the authors are finding individual research studies to support their claims, rather than deriving their argument from and through the evolving scholarly conversations. I also found the use of broad, non-specific terms, such as "good" visualizations, "numerous" tools, "interesting way to communicate" to contribute to the perception that the argument is not strongly linked to the scholarly conversations. What

does "good" mean in this context? How many is "numerous"? What makes a method of communication "interesting"?

Further, I found myself getting confused about the intended audience for the posters in question. The opening sections move between scholarly/academic audiences, the general public, and even others. I understand that the authors believe that their design can be used to develop multivalent forms of communication, which can reach a range of viewers, but I don't know of many academics, from any discipline, who would use the same design for a research poster targeted toward an academic conference and one for a general public/community event (which is what the example focuses on). The article also refers to the need for better data visualizations because of large and complex data sets, but these claims seem to be somewhat broader than, and therefore, disconnected from the purpose and utility of a poster specifically, especially in an outreach context such as described here.

The Implementation section reads much stronger, though I found the use of many outdated references to be puzzling. Visual literacy and visualization, especially through technology mediation, is a very dynamic field and articles from, say, 2013, are unlikely to reflect current lines of inquiry. You have a wealth of more recent design-based research and practice from which to draw; I am left wondering what your selection process was. I also didn't see many references to the design of multi-media museum exhibits, which seems as if it could be related to the kind of interactive public displays discussed here.

That said, overall, the implementation section makes it evident how passionate and thoughtful the authors are about communication and design, and that passion is infectious. I thought the descriptions of the collaborative process through which the interactive poster was developed to be especially insightful, providing a model for how such collaborations might work in other contexts. It would be even more persuasive, however, if you had additional support for your claims about the effectiveness of the design. Do you by any chance have any data from the collaborators? Were viewers of the display given the opportunity to provide any feedback on their experience?