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

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Potential competing interests: No potential competing interests to declare.

Landis & Duscher: interactive poster

Review by Jane Gregory

My overall impression of this paper is that it tries to do too many things. Firstly, it presents a survey of science communication research. Secondly, it makes some points about the use and value of visualisation in the communication of science. Thirdly, it describes a single interactive poster and draws lessons from it about multi-disciplinary collaboration and 'consistent' visual language. However, these three strands are not in sequence, and are tangled together in ways that make the paper difficult to navigate.

I suggest the survey of science communication research be reduced to one paragraph and some references. These references should be to works that are applied in the practice and reflection in the rest of the paper. The section on visualisation should be expanded and clarified, so that it is suitable for readers who are new to this topic. The interactive poster itself should be described in detail, in ways that relate to the literature on visualisation. The spirit of this section should be 'here's what we did, and we were pleased with it because …' – that is, the authors can report their experience, but not as research findings. The claim to novelty of interactive multimedia communication needs to be toned down and qualified.

Some more detailed points:

Abstract

The abstract is a mixture of introduction and abstract, and could be streamlined. A more precise vocabulary could be used, as I explain regarding the section on science communication theory, below. In this abstract, I notice 'transfer', 'attractive', 'emotional', 'transformation', 'consistent' and 'effective' as problematic: attractive to whom? Consistent with what? Effective at causing what?

The word 'level' – which appears several times in this paper – is particularly surprising given the efforts made in science

communication studies to think beyond the politics of the vertical hierarchy. I am similarly surprised by the use of words such as ‘target’ and ‘goal’, which suggest some (perhaps unwitting) use of communication models that have long since been rejected by the scholarly literature.

I would save the diagram for later in the paper where it can be explained.

Introduction

The first line is a good example of the problematic use of language in this paper:

‘Prehistoric cave paintings did not only serve as a message for future generations, [but] they [also] still touch us today and help us to understand past cultures.’

So the cave paintings are (1) a message for future generations, (2) a moving experience for people who see them today, and (3) a tool for us to understand the past. This list looks to me to be highly tautological, unless one’s concept of ‘message’ is that it can not be affective, and can not be explanatory. Are the ‘future generations’ the same as ‘us’, or not?

In the text, it is assumed that simplification is a unarguably a good thing – this should be exlicitly acknowledged, or discussed, but it should not be neither. Complex research should be both ‘understandable’ and comprehensible’: how do these words differ? (By which I mean, why are they both here?) What does it mean to describe a communication as ‘effective and interesting’? Effective for producing what outcomes? Interesting in what way, and for whom?

There is some history here that I do not recognise: when and where were the ‘recent years’ in which funding for science communication has grown? Funding for science communication routinely grows and shrinks in the UK, and has done for decades, sometimes in step with other countries and sometimes out of step.

The idea that these ‘recent years’ have seen the establishment of an independent field of research called the science of science communication is nonsense. Science communication research has been undertaken (using a variety of rigourous research methods) since at least the 1950s in the US and Western Europe, and ‘the science of science communication’ is a phrase from one recent paper of very limited influence.

The data in the middle paragraph on page 3 is meaningless: the digital era has been associated with an increase in the quantity of publications on pretty much everything. Since it is impossible to control for the expansion in the media space during this time, it’s better not to attempt such quantitative claims.

Social media did not give rise to a discussion about truth and scepticism: this discussion has been around since at least the 18th century, in print, in discussion, in cinema and so on. Social media carried this discussion in its turn, to its particular kind and quantity of audience/participants.

Dotted through this discussion of the history of science communication studies are some points about visualisation. I suggest that the history of science communication be dealt with in one paragraph and by referring to two or three

respectable sources, and then there will be space to gather up and organise the points about visualisation.

Page 4: the empirical claim at the end to the first paragraph is unreferenced. I suspect it is a false claim, so I would like to see the evidence. The language here suggests a lack of regard for the ways in which digital media collapse categories such as ‘user’ and ‘professional’.

I think this paper actually begins here on p.4, with the words ‘Since 2007 …’. That said, I do not follow the logic of the argument in this paragraph. It seems circular to me.

The concept of ‘scientific accuracy’ is deeply contentious in science communication studies and, if these authors have made a commitment to a particular interpretation of it, they should say so explicitly. I guess that what they mean is: ‘we believe scientists should control the message in public communication and ensure it exactly reproduces the factual content of the communication among scientists themselves.’ If this is what they mean, they should acknowledge that this perspective is contentious in the science communication literature.

pp.5-6: the points about visual communication are important and should be written as prose, building an argument. This list is difficult both to read and to tie together. The referencing seems inconsistent: every empirical claim needs a reference.

What is a ‘consistent’ visual language? Internally consistent within and among communications on oceanography? In all science communication? Consistent over time? Consistent with other media? Universally meaningful in human culture? Perhaps some semiotic theory is needed here.

The authors may want to check with museum-based colleagues about screen-based interactive displays (which they might call ‘multimedia displays’), as they may have to qualify the claim of novelty.

p.9 ‘For more than 20 years narration and storytelling ha[ve] been used to enhance students’ engagement and learning motivation in digital formats.’ I think there may be some confusion here between ‘narrative’ and ‘narration’. But also: why say ‘for more than 20 years …’? How much more? Why does it matter? Storytelling has been used to enhance engagement and learning for the entire history of the human species. Nor is this quantity of time the main point of Huang and Grant (2020). This vague and false quantification of this story is poor practice.

If emotions are being used to enhance communication, the feelings that emerge should be about the cognitive content of the communication. The pleasure of using the device does not enhance understanding of the oceans in and of itself, even if it does encourage users to linger at the screen.

Discussion, perspective and conclusion

Here we return to some basic points from the science communication literature. This discussion seems detached from the experience of the interactive poster itself.

‘Nowadays, new scientific visualisation and communication strategies are in demand more than ever.’ Evidence? Reference?

It is not novel for scientists and designers to work together. If there is to be a claim of novelty made in this paper, it needs to be more precisely stated and evidenced.