

# Review of GC-2018-1 - Building bridges between experts and the public: a comparison of two-way communication formats for flooding and air pollution risk.

## Summary

The article compares different communication strategies between experts and the public for the cases of flooding and air pollution risk. Different communication format, i. e. social media, educational programmes, serious games, citizen science, and forums are systematically reviewed and analysed in terms of short-time and long-time effectiveness. The authors conclude that the different formats all have their advantages and drawbacks and should be used depending on the purpose and the people involved.

## Review summary

1. Does the paper address relevant scientific questions within the scope of GC?  
Yes. As is stated on the journal's webpage, "the purpose of this journal is to help share knowledge and give more "traditional" recognition to science communication in the geosciences". In particular, the journals subject areas of geoscience education, geoscience engagement, and open geoscience are addressed in this article. The paper also discusses (science) communication theory and incorporates aspects of social science.
2. Does the paper present novel concepts, ideas, tools, or data?  
The paper is a review paper with the purpose to compare the success/appropriateness of different communications strategies in the context of flooding and air pollution risk. To my knowledge, this has not been done before in this context and thus the article offers novel insights to the subject.
3. Are the scientific methods and assumptions valid and clearly outlined?  
Methods are very clearly outlined. The assumptions are to some extent rather implicit and could be made more explicit, but I think this is the case for most articles throughout all subject areas.
4. Are the results sufficient to support the interpretations and conclusions?  
yes.
5. Do the authors give proper credit to related work and clearly indicate their own new/original contribution?  
yes.
6. Does the title clearly reflect the contents of the paper?  
yes. However, in some instances I slightly disagree whether a given approach really is two-way and not one way (see detailed review below)
7. Does the abstract provide a concise and complete summary?  
yes.
8. Is the overall presentation well-structured and clear?  
yes.
9. Is the language fluent and precise?  
I'm a non-native, so I might be wrong, but I think that the English could be improved (commas and wording). Please see the second part of the detailed review ("minor points")
10. Are the number and quality of references appropriate?  
yes.

## Detailed review - specific comments

### Main points

#### 1 Introduction

##### Page 1

Line 25 & 26: To me, it is not quite clear why the responsibility shifts to the local scale? This clearly implies that the responsibility has been on the regional (?) or national (?) scale before, which from my point of view has not been the case. In the contrary, one could argue that increased frequency and magnitude of events often calls for national instead of local action (e.g. stricter national laws on air quality, help of the army in case of severe flooding).

Maybe one could say is that local population is more often confronted with these hazards and thus the call for resilience might have shifted from nationwide to local, so that local governments are forced to act. In a nutshell, I don't think the responsibility has changed, but rather the demand for specific and effective actions. The responsibility has always been there, but now has to be transferred to actions.

##### Page 2

Line 30: Reaching consensus would mean to ask for a "sociacracy", right? I.e. to keep on discussing till a solution is reached to which all consent, instead of having an agreeing majority and a disagreeing minority. If you mean this, you should maybe stress this point much more, because it has huge implications.

##### Page 3:

Line 17-18: Whether the impacts of air pollution are distant in time or not (and whether it's invisible or not) strongly depends on the level of air pollution, e.g. air pollution in Beijing, or, most recently, in California due to the wildfires.

##### Page 4

Line 6-7: Throughout many science communication papers I'm rather puzzled by the mixture of or confusion of the terms "information" (per se one-way) and "communication" (per se two-way), and by the many references to Shannon and Weaver. Since Shannon and Weaver, there has been so much work on communication, and I can't quite believe that this is still discussed. Personally, I prefer the understanding and definition of communication by Niklas Luhmann, who distinguishes between the difference of information and message within a communication. His concept is rather difficult, but very fruitful if one wants to understand why our communication efforts fail so often. From my point of view, even if Luhmann is not taken into account, the discussion should move far beyond Shannon and Weaver.

Aside from all this, the whole sentence about Shannon and Weaver disturbs your argumentation flow, since you're talking about communication formats before and after this sentence. I'd therefore suggest moving this sentence elsewhere.

##### Page 5

Line 4 onwards: The readers continuously must flip pages to see which criterion is meant, respectively. Please consider mentioning the respective criterion in addition to or instead of the number, e.g. criterion 1 "two-way communication".

Line 17-19: Why was accessibility such an issue? I believe this considerably reduces the number of the articles.

*Pages 6 & 7*

Table 1: There is no article older than 2011. How comes?

*Page 8:*

Line 9 onwards: The example given is a little bit confusing if you want to present “two-way communication”, since “to issue warnings and information” is classically one-way. Even if citizens themselves can post, this still is one-way (and in some sense bottom-up information sharing), unless dialogue is created. Maybe you want to express something else, but the wording you use might just give an impression you’d maybe want to avoid. However, I really do think that even if information is ‘consumed’ (this is so typically one-way, isn’t it?) shared and spread, this is effective information (“communication” policy in the classical sense), but not two-way communication.

Line 17 onwards: I’d also doubt that this example really is about two-way communication. To me, it seems it is rather just “the other way around”, i.e. from the ‘laymen’ to the ‘experts’. But this doesn’t make it two-way communication, does it? It might, however, empower the citizens. Especially if you cite that the collective intelligence is “utilized” and information is “acquired” this is just the classical approach, since nothing is discussed, citizens are not further included in the process. They are just informants.

Line 30 onwards: same problems as above. Where is the two-way communication? That social media is very effective in information spreading and information acquisition is well-known (and also that it can be easily misused), but I really do not see aspect of two-way communication. Just by mentioning “campaign” classical approaches are indicated. I think we must be very careful with words, especially when we try to propose new ideas and concepts – if we use “old” wordings it is difficult to overcome old thinking.

*Page 8*

Line 11: What do you mean by “control over the communication”? I think that either individuals or institutions might be able to control whether communication *starts*, but as soon as communication in fact has started, it seems to be rather self-organized and “out of control”, i.e. impossible or at least highly improbable to be steered. I think that this can be observed especially well in social media. Furthermore, one could get the impression from your text that it is per se undesirable to have government agencies having power and that it is per se desirable to have this power distributed. I can imagine examples for both cases where this is not the case. In times of fake news, both can be used for making democracies/discourses/discussions more vulnerable (e.g. by fake news) or for strengthening them.

Lines 14 - 16: Here, you state that maintaining control in responsible hands is key. This somewhat contradicts your previous statement (line 11) that control is distributed.

*Page 15*

Figure 3: I think that this figure is somewhat oversimplifying. Just because e.g. social media is only used for coordination of citizen science so far, this does not mean it is the only way it can be used. Likewise, I’d say that it is possible to include serious games in citizen science or even in educational programmes. If you’d change the subtitle to “... and forums are currently being combined” this would leave space for new combinations or would even encourage new ideas.

## **Minor points**

### *Abstract*

#### *Page 1*

Line 14: Delete the two commas before and after “nor”

Line 15: correct to “purposes”

Line 16: is it really about being representative of certain population segments? I’d rather say it is suitable/appropriate/apt...

### *1 Introduction*

#### *Page 2*

Line 1: articles on?

Line 2: , and promoting

#### *Page 3*

Line 4: Why “in detriment to”? If it is “in detriment to an equal partnership”, this (to me) sounds very negative.

Line 9: Rather “which” instead of “what”?

Line 12-13: “on the one communication format in particular” sounds very specific, so as if the reader should know which “one” format is meant. Since the text has been very unspecific about this so far, please consider rephrasing. Probably the sentence should also start with “whilst” or the like.

Line 16: What do you mean with “flooding is discrete”? Spatially? Temporally? Both?

### *2 Two-way communication...*

Line 22: Change chapter number to “2”

Line 23: Change chapter number to “2.1”

#### *Page 4*

Figure 1: I believe you’re only showing the inclusion criteria and not the exclusion criteria. Furthermore, the numbering in the sub-text is a little bit confusing, especially because (for the reader) step 3 comes before step 2. Step 7 is not explained in the sub-text. Maybe it’d be good to also include the numbers in the figure.

Line 7: I believe the source shouldn’t be in parentheses. Suggestion: Wood (2011).

#### *Page 5*

Line 1: Change heading number to 2.2

Line 2: a set of seven inclusion criteria *was* designed

Line 3: Boxes in figure 1 do not have numbers, please consider doing so

Line 7: Consider rephrasing of sentence

Line 7: “participants” instead of “participant”

Line 9: “users do not” instead of “user” (sentence continues with “their”)

Line 21: renumber heading to 2.3

*Page 8*

Lines 1 & 2: renumber to 3 and 3.1, in line 2 delete “.”

Line 3: delete comma behind “communication”

Line 5: comma after “most often” (I assume)

Line 8: consider simplifying sentence to “can be done so with three different aims”

Line 14: consider rephrasing of the sentence – to me, it’s rather incomprehensible (why “if”?)

*Page 9*

Line 9: Delete comma after “public”

Line 10: coexist instead of coexists

Line 24: Delete full stop

*Page 10*

Line 7: Delete comma after the parenthesis

Line 28: Delete full stop

*Page 11*

Line 28: Delete full stop

Line 32: Sentence incomprehensible – no comma after “that”, and what is meant by “sittings”?

*Page 12*

Line 6: “accessibility” instead of “accesibility”

Line 10: Insert hyphen after “alone”

Line 28: Change to “Citizen science seems”

*Page 13*

Line 1: Delete full stop

Line 16: change to “possible”

Line 27: insert comma after “forums in the UK”

Line 32: delete comma before “consists”

*Page 14*

Line 1: insert comma before “and political”

Figure 2: in the section of citizen science, change to “long-term awareness”; in some sections there is neither <, nor >, nor = between F and P, but just a blank space.

*Page 16*

Line 5: There is no “on the one hand” mentioned before.

Line 19: change to “Following Davies (2014) and Harvey (2008)”

Line 27: change to “Katz and Lazarsfeld (1966)”

*Page 17*

Line 6: phenomenon

Line 17: delete comma before “such as China”

Line 22: games

Line 24: seems; because of

Line 30: findings (and methodologies?)