Reviewer’s report

Title: Participatory Science and Innovation for Improved Sanitation and Hygiene: Process and Outcome Evaluation of Project SHINE, a School-based Intervention in Rural Tanzania.

Version: 1 Date: 19 Nov 2016

Reviewer: Kristyna Hulland

Reviewer's report:

Overall, this paper is ambitious since the authors present results of a complicated intervention with different audiences for intervention and mixed methods. The results present an interesting opportunity to talk about the OneHealth approach and compare qualitative and quantitative results. This is an important contribution, but the paper requires more finesse.

1. The OneHealth approach is central to this paper. However, the authors should be diligent in citing the literature on the One Health approach in both introduction and discussion.

2. Additionally, the intervention in a pastoralist community is highlighted as a major contribution, but the authors later state the intervention in schools may not be representative of pastoralist communities. This representation should be reworked so the implications are not misleading to readers.

3. The authors should pay careful attention to grammar throughout. For example:

Line 28: past tense (the sentence should either be rewritten as suggested below or made present tense)

Line 95: "[SHINE clubs]… were tasked with…. Host school wide community events." Change to "hosting"

Check punctuation in all of your quotations and be consistent. Sometimes the citation of the speaker is inside the punctuation, sometimes it comes after the period.

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Line 33: for consistency, follow up should be changed to follow-up

Line 37: remove comma after water

* I will use the line numbers included by the authors in the manuscript body
Background

Line 16: Use the more conventional name "Sustainable Development Goals" since this is how they are branded by the UN in the ref you provide.

Line 17: Consider adding the title for Goal 6, Clean Water and Sanitation.

Line 28-9: Contextualize this statement with more specific information about what was included in the Joshi article.

Line 32: What is the "black box"?

Line 73-4: the first objective seems very broad. Consider stating this objective more concisely. In addition, you may want to describe the second part of this objective in more detail elsewhere. You mention increasing "interest and motivation for science give the focus in the project on developing innovative strategies such as through frugal science." This is not intuitive on its own and needs to be unpacked. Or consider deleting "such as through frugal science" from the first objective.

Line 91: delete "and" between scientific and sanitation

Line 102: delete "related"

Line 103-5: revise sentence.

Methods

How did you develop the survey questions? Were these questions used elsewhere in KAP studies related to WASH? Since this was a participatory approach, what was the role of the local community in developing the survey?

Who administered the surveys?

Who did the coding? Were the transcripts double coded and discussed by the team? Did you develop a codebook? More description is needed of methods.

You describe log books in your methods and describe workshops. Perhaps this section should be retitled to reflect lessons generally. Then you can discuss materials provided to teachers, general processes of the lessons, and the use of log books to track lessons.

Community consultation: when chronologically did this happen? If the community consultation was involved in the development of the tools, this should come earlier in the methods.
Line 114-5: Do you mean questions related to sanitation and hygiene knowledge, attitudes, and practices? Or are the knowledge and attitudes more general, and only practices sanitation and hygiene specific? If the latter revise the sentence to include what types of knowledge or attitudes you generally were assessing.

Line 122: Consider removing "fact" and change to "Due to the sensitivity of some of the topics and to reduce ...."

Table 1: you do not describe the calculation of Cronbach's alpha anywhere in the text.

Line 152-5: This is a concise description of inductive coding and a grounded theory approach. Include references to methodology.

Line 161: For consistency, make logbook two words.

Line 168: remove comma after stakeholders

Results

Table 2: Check for consistency with punctuation and capitalization in this table. For example, sometimes you write Individual Interviews, and other times it is not capitalized. Remove period in SHINE School Lessons cell. Hyphenate extracurricular. If you are using WASH as an acronym, make sure it is in all caps.

Line 198: Add comma after ongoing.

Line 199: Should support be singular?

Line 231: Since this is a quote, avoid using e.g. Replace with a word that would have been used in this quote.

Line 246: What is the "it" in "... remarked that it was an important..."? Workshops? Lessons? Please be specific.

Line 263: In the preceding section, you shared three quotes about how the intervention worked with school curriculum. Then, you present evidence exactly to the contrary here. I suggest changing how this is presented. Maybe it is better to synthesize these thoughts. For example, while some teachers thought SHINE activities were relevant with existing duties, others found that it was a challenge to devote time to these activities.
Discussion:

Overall, this section needs more grounding in the literature. Are there parallel findings in other studies? Do the methodological and One Health approaches have similar or different findings?

Line 425: Why were lessons on Saturday? Did this impact attendance?

Line 428-430: Please describe more specifically how successes in train the trainer models were reported in the literature. This is a sweeping statement.

Line 440: Describe what you mean by "social desirability bias." Are there examples in the literature where respondents over report their KAP? Cite these here.

Line 459: Use double quotation marks here and give reference to the speaker. Also, this belongs in your results.

Line 468-471: Cite literature about One Health approach.

Line 504-6: You state several times that this is the only KAP study in a pastoralist community, and here you mention that the intervention sites were not representative of other pastoralist communities. This seems to be a major problem. If this is the case, you should describe ways the intervention activities were relevant to pastoralist communities, and ways in which the school environment specifically was different than typical pastoralist communities.

Line 514-5: remove comma after "SHINE" and "approach"

Line 517: It is important to note that CLTS has been very affective in behavior change. You should cite its success, while also discussing the ethical implications of the approach (Line 517-9)

Line 527: Delete "in contrast." I think this is in contrast to CLTS, but NOT the other more positive approaches cited above.
Figures

Figure 1: the arrows in the outcomes section are messy and this portion should be revised. Rather than having three individual arrow per short/medium term box, it may work better to have a large bracket for all four boxes on the short/medium side, with just three arrows pointing from the bracket to the long-term boxes.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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