

Interactive comment on “Engaging children in geosciences through storytelling and creative dance” by Ana Matias et al.

Ana Matias et al.

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gc-2019-21 Reply to RC2 comments on “Engaging children in geosciences through storytelling and creative dance” by Ana Matias, A. Rita Carrasco, Ana A. Ramos, Rita Borges

“Reviewer comments” and authors’ reply.

“While I admire the approach to activity development I find it problematic to separate the learning activity from the communication of the science as stated in text beginning on lines 55 and 395. If the goal is to raise science capital rather than geoscience literacy, more evidence would need to be presented regarding the positive linking of the physical activity to the understanding, familiarity, and comfort with the science, or

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any science, being communicated. Without this, the evidence is only convincing in demonstrating an increase in social capital, at best cultural capital.” REPLY: In line 55 we state: “here (...) engagement is a loosely term referring to behaviours that demonstrate interest in, or interaction with science-related activity or experience”. In line 395 we state: “Regarding the activity impacts, inquiry results showed that all children enjoyed themselves. Nevertheless, the improvement of geoscience literacy was not measured.” Our point is that the physical activity contributed to the familiarity and comfort with science. We are not sure if we understand entirely the reviewer’s point; nevertheless, we can add after line 395, that we have qualitative evidence of increased familiarity and comfort with geosciences (e.g., use of scientific terminology by students towards the end of the activity), which is the result of both the brief explanation in the beginning of the section, reinforced by the physical exercises. In future works, effects should be evaluated separately.

“The manuscript would be greatly improved with some simple changes to the evaluation including, 1) Pre-activity data on knowledge of coastal morphodynamics – this need not have detracted from the activity as could have been included interactively in the introductory section by asking for experiences of waves/shorelines. 2) Pre-activity data on how pupils prefer to learn science: this would have greatly strengthened assertions that the activity was a preferred method rather than relying on feedback post event collected by those delivering, which has a strong likelihood to create audience bias through wanting to please the activity deliverers. 3) Follow up data on the pupils’ understanding and retention of the principles being communicated at 14 days or other time period as deemed suitable post event. 4) Pre and post data on science capital of the teachers and pupils. 5) Evaluation of any impact on the researchers and creative partners. 6) Follow up with teachers on the impact of the activity on team building, etc, would be a useful metric as well. I do however appreciate there are difficulties in collecting some of this data. It might have helped to have more teacher involvement in developing the activity to support follow up evaluation.” REPLY: The reviewer suggestion is pertinent and we acknowledge the concern. We were not sure, at the beginning,

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about the feasibility and receptivity of students and teachers to this activity. The activity implementation, rendered in this manuscript, demonstrated that coastal geosciences are suitable for this type of Science & Art approach and age group; and this was our main drive for trying to disseminate it within the science communication community. On the discussion and conclusion sections of the manuscript, we will reinforce that evaluation is a shortcoming of the work that needs to be acknowledged in future studies and that the step forward to scientifically demonstrate impacts (at least on the short-to medium-term) is to implement an evaluation plan, which can follow the phases proposed by the reviewer and include a methodology to evaluate separately the impact of the introductory phase from the physical activity. We gratefully thank the reviewer's generosity in taking the effort to propose a plan.

"I also appreciate and fully agree with the authors' insight into the limitations of this study (text starting line 315, and 369) and believe that careful evaluation planning integrated into the delivery would have in fact provided the data required to greatly strengthen the manuscript. The data collected could be considered a baseline for further delivery at, for example, European Researchers' Night 2020." REPLY: We are totally in agreement with the reviewer. The proposed plan (reviewer previous comment) will be included on the manuscript, in discussion section as an issue to move this (and similar) activities further.

"Finally, I fully agree with the authors' point, starting line 385, that more analysis on the emotional connection with learning is a factor that should be recognized and measured more in science communication." REPLY: We thank this remark. Furthermore, we will add a note about this analysis on the emotional connection on the evaluation plan proposed by the reviewer (see previous comments and replies) that will be added on the manuscript, at the end of the discussion section (after line 374).

"Line 180: what is 'psychomotricity'? Please define." REPLY: Noted. We will add a brief explanation and examples.

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"Line 215: I would like to see a reference for both Laban's theory of movement and the adaptations from Anne Green Gilbert." REPLY: We will add a brief reference to Laban's theory of movement and referred adaptations.

"Line 248: A reference or link to the EVREST project would be useful." REPLY: Noted. We will add.

"Line 272: typo: 'brief' should be 'briefed'" REPLY: Noted. We will correct.

"Line 321: typo: 'trough' should be 'through'" REPLY: Noted. We will correct.

"Line 322: Please rephrase 'it seems to promote ocean literacy' (perhaps to it 'may have the capacity to promote. . .'), or present evidence that this is the case, qualitative or quantitative from pupils directly or from teachers." REPLY: Noted. We will change as suggested.

"Line 337: please provide your evidence, even if it is observation based, on how you assessed the presence of the 'positive emotions'." REPLY: We will add elements based on our notes, videos and photographs observations.

"Line 339: While the association of pleasant memories to science seems probable, I can't see the evidence presented that this is the case. Please make it clear if this is evidence based or a supposition." REPLY: We will change to clarify that it is a supposition.

"Line 356: While social benefits again seem probable, I can't see the evidence presented that this is the case. Please make it clear if this is evidence based or a supposition." REPLY: We will change to clarify that it is a supposition.

"Line: 367: word omission: please place 'of' between 'identification' and 'whether'." REPLY: Noted. We will correct.

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