

Interactive comment on “Making rainfall (fractal!) features fun: scientific activities for teaching young children” by A. Gires et al.

R. Hut (Referee)

r.w.hut@tudelft.nl

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The authors describe their effort to develop educational activities for children, both a “do an experiment” activity for kids aged 5-6 and a “write a book together with a scientist for kids aged 8-9. Whether the goals set out with activities are met is not evaluated, the paper merely describes the activities themselves. However, the design of the activities is based in a very extensive and commendable literature review. I would go as far as to say that this paper constitutes a very important review of the literature on effective science lessons in (primary) education, illustrated with the case study of developing a rainfall-education package. Given how many (geo)scientist develop, or consult in the development of, educational packaged at some point of their career, I judge this paper to be highly important for the (geo)scientific readership.

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Having said that, I do have a few remarks:

- Can the authors explain why they did not include a quantitative evaluation in the first place? (page 17, line 10). Although, as explained above, the article stands on it's own as a literature review plus case study, but would have gained in value from a quantitative analyses that tests wether the goals set out in the design are indeed achieved. This is my main concern / comment on this paper. Further comments are minor.
- The first activity is done with a group of children aged 5-6 and the second with a group aged 8-9. In the introduction, the authors mention that the interest in school declines significantly at ages 11-14 (page 3, line 21). I'd like to ask the authors to elaborate how the choice of age groups that they made relates to this. Are the age groups chosen the most effective, if the goal is to interest more kids in (geo)science?
- I would strongly advice against (over)using Chinese proverbs (or other cultural “true-isms”). (page 4, line 1). My reading of the work cited at the top of page 4 is that offering different teaching modes is better for retention, not that any specific teaching mode (“involve me”) is better than an other (“tell me”), merely that a mix of modes works best. Note that I do not advice to use “learning styles”, but that what I take home from the articles cited is that offering a varied collection of experiences is best for retention.
- it would be helpful, for me, if the learning goals of the activities were mentioned in a central place, maybe in a table. Now they are scattered throughout the article (page 7 line 22 till page 8 line 4, page 7 line 15, page 9 line 1-5, etc.). I also believe that the authors mainly focus on knowledge transfer as a learning goal: the pupils should know about stuff at the end. However, I also believe that the actual skill involved in doing a measurement is worth mentioning as a

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learning goal: the empowering notion that you can know something by measuring it yourself, in stead of trusting the knowledge passed on to you be others.

- The mathematical explanation of the cascade model is very detailed, for a paper that does not focus on the mathematics, but on education. Maybe the details of the model can be better mentioned in an appendix. Furthermore, I suggest to state that although the original model used “alive” and “dead” labels, in the case of this research, “wet” and “dry” will be used.
- in our review paper on “geoscience on tv”, we included a paragraph on narrative structure. Maybe some of the references in that paragraph can be included on page 15. (The review paper is currently under review in HESSD: www.hydrol-earth-syst-sci-discuss.net/hess-2015-518/)
- on page 16, lines 8-12, please indicate the qualitative nature of test to see if everything was understood.
- at some points, I noticed some mistakes in english, for example page 5, line 2 (the second “of” should go) and page 15, line 19 (the “the” should go). Since I am not a native English speaker, I may have missed additional mistakes in English and I advice to have the article proofread by a native speaker who wasn't involved in the article until now.

and some more personal notes:

- thanks for the reference to Maltese and Tai (2010), your lines 24-26 on page 3 helped me understand my own motivation to go into science. I also had one of these “specific memorable activities” in my primary education.
- the work of Som et al 2012, on 2.7 billion years old drop size distributions, is new to me and very cool!

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Rolf Hut

disclaimer 1: the authors received funding in the RainGain project. In the group that I work in, we also received funding from RainGain. Personally I have never worked with (nor have I met, to my knowledge) any of the authors of this paper.

disclaimer 2: my own area of research is mainly sensor design in the hydrosphere. Although I have practical experience in science communication and teaching, I do not consider the “science of effective education” to be my specialty. I can therefore only gauge the hydrological part, and the general scientific soundness, of this paper as an expert. I will, for example, not be able to judge if the authors missed a key publication in the field of education that is essential to this paper.

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