

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

**A. Gires et al.**

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First the authors would like to thank the reviewers for their suggestions that helped improve the manuscript. Hopefully the changes implemented will satisfy their requirements.

“Referee Comment 1

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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

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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.

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 main reason, is that it was initially done as an activity in the class of the eldest son of the first author. It is now mentioned in the introduction. Future implementation will include a quantitative evaluation. Nevertheless some qualitative evaluation was included throughout the text, as also suggested by the other referee.

“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?”

This was also pointed out by the other referee. First the book is designed for children aged 8-12. It was done in a collaborative way with a class of children aged 8-9 so that it can be understandable for the whole age range targeted. With regards to the other activities, it is true that they were initially implemented with children aged 3-5 years. This was a practical choice driven by the fact that the son of one of the first author was in that class, which facilitated the first contact with the teacher ! This point was clarified

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in the introduction. Since then the disdrometer experiment has been implemented in other place.

“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.

The Chinese proverb was removed in the revised version of the paper. The referee is correct, and the paragraph was slightly changed to reflect more precisely this point.

“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 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.”

Authors have the feeling that the learning goals are rather visible at the beginning of each section. However if the referee wants them included in a table, it can easily be done. The “new” learning goal suggested by the referee is now mentioned in the discussion on the disdrometer activity.

“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. “

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Following the referee's suggestion, this portion was moved to an appendix for the interested reader. In the appendix the wording dead or alive was kept for historical reasons but your point mentioned.

"â€” 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/](http://www.hydrol-earth-syst-sci-discuss.net/hess-2015-518/) )"

Thank you for this suggestion of interesting paper. We included a reference to it along with one to Dahlstrom (2014)

"â€” on page 16, lines 8-12, please indicate the qualitative nature of test to see if everything was understood."

A paragraph was added in section 3.2 to indicate precisely what work and what did not work.

"â€” 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."

The article was proofread again.

"and some more personal notes: â€” 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. â€” the work of Som et al 2012, on 2.7 billion years old drop size distributions, is new to me and very cool!"

Thanks !

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