

## ***Interactive comment on* “Engaging the students of today and preparing the catchment hydrologists of tomorrow: student-centered approaches in hydrology education” by I. Ngambeki et al.**

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This paper attempts to achieve two objectives:

1. Review developments in theory of Education in the context of hydrology education at upper undergraduate and post-graduate levels.
2. Provide some examples where they attempted to apply these in Hydrological education.

The discussion of the paper, particularly in the case of examples, focuses on the field of catchment-hydrology. This does not limit the value of the contribution in the wider field of ‘water studies’.

Generally the paper succeeds in achieving what is stated in objectives. However, what it lacks is hard evidence of scientific form that the example approaches the authors present do work. We have to take authors’ word on the face value in the case of point (2) above. It is indeed difficult to do this in the field of education, where many notions can be hard to quantify (compared to, say, natural science). At least an analysis of the student feedback would have been nice.

The value of this contribution lies in the fact that it provides a good review of developments in education in the context of hydrology. Perhaps this contribution should be treated as a review paper.

They bring forth the ‘flowerpot’ analogy to explain the concept of Pedagogical Content Knowledge (PCK). While analogies are powerful, at the same time they have the potential to mislead the students. An analogy of a similar nature is used by almost all teachers of hydrology. However, a good teacher using such analogies should continuously aware of how the knowledge is constructed in the students’ minds (by means of letting the students express ideas, short-quizzes asking and letting the students to ask questions, etc.). The teacher’s knowledge of content and experience in pedagogy could help alleviate such issues.

My suggestion is that the authors should not refer to the ‘flower pot’ example as ‘an effective PCK’. A teacher with mature PCK can use such analogies (By the way, as authors point out, PCK is not only about analogies!) and other tools effectively to promote effective construction of knowledge. It is possible (unintentionally) misuse such tools by an inexperienced teacher.

My second point is about the use of graduate teaching assistant: “The support of the teaching assistant was critical to the success of the term project: the students

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felt supported in their ability to complete the project tasks, while the professors' time was freed to focus on the higher-level science questions that were explored in the comparative analysis".

I am aware of the widespread practice in North America to do the plenary lectures by the faculty and then delegate the 'messy' and time-consuming part of supporting students to the teaching assistants. I also understand the some of the reasons that make this an attractive option and even those sometimes compel faculty to do this. However, portraying this as good student centered education practice is a misrepresentation of the facts. Arguments can even be made about the reverse: get the students to read material by themselves and then get experienced faculty to address their common questions and misconceptions.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 707, 2012.

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