

Interactive comment on “Demonstrating the “Unit Hydrograph” and flow routing processes involving active student participation – A university lecture experiment” by Karsten Schulz et al.

Anonymous Referee #1

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This paper presents a method for interactively teaching students about the unit hydrograph. The approach taken is simple, involving the students passing balls along defined flow pathways so that the result at the "catchment outlet" can be observed. It is a simple, low-cost method of demonstrating a simple case of "unit hydrograph". Given the time needed to run each "experiment", I feel that a hybrid approach would be better, where the idea is introduced using a simple participatory demonstration as described here, but more detailed experiments are done through computer simulation. This is particularly the case when the time needed for a single experiment (including discussion) is between 30 and 90 minutes (page 9, line 4-5). 90 minutes is a considerable break in a 3 hour lecture, and suggests a more efficient method might be needed.

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The real question here is: how many such experiments are needed in order to provide a suitable improvement in student understanding? Can a combination of participatory and computer examples achieve the same effect in less time?

The paper gives a reasonable review of the history of the unit hydrograph. I consider that the authors are incorrect in saying that the effective rainfall is homogeneously distributed over the catchment (page 4, lines 2-3). This is not necessarily the case. What the UH concept considers is that the spatial distribution of effective rainfall doesn't change between events. It can be non-homogeneously distributed. This can be due to spatial variations in rainfall (e.g. due to topographic effects), or due to spatial variations in the fraction of rainfall that is converted into effective rainfall (e.g. due to topography, soils, vegetation). Considering the effective rainfall to be homogeneously distributed across the catchment is a simple case, but not really the requirement of the unit hydrograph concept.

I think papers like this do have a place in HESS - but this paper needs a little more work in order to be of publishable quality.

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