## Responses to the Reviewer #2 Comments

(Referee comments in black; Responses in blue)

First, we would like to thank the reviewer for his/her fair and very valuable comments. In the following, we have addressed each reviewer comments in detail and have indicated how we might alter and update the manuscript given the comments. We hope that we have addressed all comments sufficiently, and we are looking forward to your feedback and your decision.

**Comments by Referee #2**

1. *This paper presents a creative method of teaching the Unit Hydrograph, a fundamental concept in hydrology, in an interactive and non-lecture format. This would be a good addition to HESS as more and more instructors hope to incorporate nontraditional and active methods of teaching STEM concepts to suit different types of learning styles. While the demonstration may not be feasible in some cases, this paper presents one option of teaching the UH concept and could be the basis of different modifications to suit individual classroom needs.*
   We thank the referee for this statement!

2. *One general concern I had was that the authors cited "strong difficulties in students' perceptions of the UH' as the motivation for using the active demonstration. However, I could not find what specifically the previous concerns were and if they were actually addressed/reflected in the final evaluations after the demonstration. I believe summarizing some of these learning difficulties and how the demonstration overcomes them would help convince other readers to try this method, especially if they are encountering the same issues with their students.*
   One major difficulty we observed in the exams of years before was a general lack of understanding of the UH-principle. Namely, that the unit hydrograph represents a transfer function that describes the "generation" of a hydrograph given a unit of effective precipitation in a catchment. We first included (for the case of a uniform distribution of effective precipitation) an interpretation of the UH as a distribution of travel times (similar to time-area histograms). It seemed not sufficient as still a large number of students were not able to formulate the functioning and interpretation of an UH properly. Our impression is, that with the introduction of our experiment understanding has improved (also many students now use the experiment as an example to explain the UH). However, given the large variation of students' backgrounds and capabilities from year to year, I would not dare to express any direct and sole effect of the experiment quantitatively. → We will add some specification of concrete difficulties as done here, but otherwise I would link to our answer to referee#1's comment 3.

3. *The organization of the paper as well as the figures are of good quality; the only concern regarding the writing pertains to some awkward phrasing and some typographic errors (see technical corrections in supplement).*
   See below.

*Specific Comments*

P2, Line 14 – This section starts at a nice review for the UH; however the Zoch and Clark references here are inserted without much description and are vague. If you want to use them as using 'similar concepts', I would suggest you provide more details.

As the introduction into the UH is already quite long, we prefer to not extend the description, and rather to delete that sentence.

P2, Line 19-21 – You should cite what you say here

Given the infiltration process as one of the processes that control effective precipitation, and given the non-linearity in the soil hydraulic properties, we do think it is obvious that this process is non-linear. We believe that additional explanation are not necessary in the text and also do not think it is necessary to have a citation for this fact. Nevertheless, we are happy to provide a reference, if required by the editor.

P2, Line 25 – Different conditions such as?

We will add them. Examples are: soil moisture, climate.

P2, Line 33 – I believe that the MHM model in the Samaniego paper does *not* explicitly use the UH concept as a routing method as it summarizes different grid cells through the regionalization process, then upscales to larger spatial scales and is not necessarily constrained to the UH assumptions/limitations. Perhaps double check the use of this citation.

The mHM uses a simple triangular UH to convolute runoff that is produced in each cell to represent spatially variable runoff production. The routing between cells in the catchment however is done differently. Therefore we would like to keep this citation of a current mesoscale hydrological model making use of the UH concept. → I suggest we add a sentence to address the use of the UH in the mHM model in a more concrete way.

P3, Line 12-13 – Could you elaborate a bit more here? Understanding how the students struggle here would help the reader understand how the activity improves their understanding

See answer to comment 1

Figure 1 – The figure illustrates the concept fairly well. I would choose colours/patterns that contrast more. Also make sure that the final version does not have blurry text

Will be accordingly changed.

*Technical Corrections*

P1, Line 12 – Unit-hydrograph and unit hydrograph are used interchangeably throughout the text and title. You should pick one and be consistent with it

P1, Line 13 – 'up-to-date' is awkward, perhaps use 'to date' or 'to this day'

P1, Line 15 – topic addressed in most of the (engineering) hydrology…

P1, Line 19 - experiment involving an active student….

P2, Line 10 – A step further has been the first attempt of a spatially distributed…First section is awkwardly phrased.

P2, Line 18 – Check that your references don't have the brackets {} for next submission. They also appear later on.

P2, Line 28 – Principal idea, not principle

P2, Line 30 – In other words,

P2, Line 36 -in any of the academic hydrology courses at the (BSc and MSc); I would say undergraduate and graduate level as they can be different in institutions or countries, e.g. BASc, B.Eng., etc.

P4, Line 1 – We would like to point out here, that the UH…

P4, Line 3 – a spatially explicit

P4, Line 8 - Units for runoff are given normalized by …

P4, Line 14 – 90 min

P5, Line 21 – The sampling of the water packages and along is carried out with…

P7, Line 16 - …by a yellow ball (first event from Figure 1)

P7, Line 20 - many of the recent

P7, Line 29 – (e.g. steep areas close to …. You need to close the parenthesis somewhere

P9, Line 12 – Confucius

Technical Corrections suggested by Ref. #2 will all be considered and implemented.