

Interactive comment on “Introducing Electronic Circuits and Hydrological Models to Postsecondary Physical Geography and Environmental Science Students: Systems Science, Circuit Theory, Construction and Calibration” by Nicholas J. Kinar

Anonymous Referee #1

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General Comments Overall, this is a very interesting paper that explains the planning and execution of a circuit building and calibration activity in an advanced undergraduate hydrology class. I think the information that is presented will be of interest to other educators teaching hydrology and climatology classes. The author does a good job of providing details on all aspects of the activity and how the activity was received by the students. I think the paper would benefit from clearly identifying what the questions and/or objectives of the study are and restructuring the methods and results to

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separate out conceptual and technical information, as well as ensuring that results are not presented in the Methods section. For example, the information on different types of systems in section 2.1 Background could be integrated into the Introduction section to provide a rationale for the study. A lot of this information seems out of place in the Materials and Methods section. As well, throughout the paper, very short paragraphs (2-3 sentences) are used (e.g. L248-57). While I can see the benefit of this in some places, I think the overall flow of the paper is hampered with this approach. For example, in section 2.3, the focus of the paragraphs jump around quite a bit (technical information about the calibrations, student feedback). Overall, I recommend the author try to integrate some of these shorter paragraphs together under common themes. In the results and discussion section, the author should try to make clear links back to the research questions/objectives, i.e., try to make the different sections of the paper mirror each other.

Specific Comments L53: I recommend changing ‘will eventually’ to ‘may’. L67: Unclear what ‘threshold concepts’ is referring to in this sentence. L76-83: I recommend trying to tighten up this paragraph a bit as there is some repetition. For example, ‘Before circuits are constructed...’ and ‘Prior to circuit construction...’. L110-3: The mention of HRUs, CRHM and SWAT seem unnecessary here. They do not further the explanation of systems in hydrology in any way. I recommend removing these or rewording to make it clear why this information is useful for understanding hydrological systems. L210-4: This paragraph seems out of place here since below the actual details of the activity are explained. L225: I recommend presenting the methods sequentially. This paragraph describes what happened before the activity started, so present it first. L231-2: Was this based on written feedback? Or just the verbal feedback? L258-266 and L280-4: This seems like information that should be in the Results and/or Discussion section. L297-305: Section 2.4 is really a result of the study. I recommend moving it into section 3. L308-24: Section 2.5 seems more suitable for a Discussion section. L412-414: Instead of using the trends plot, I recommend providing quotes from the students. Otherwise the reader is left to guess the context for each of these words. L425-35: I’m

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not sure that the overall course survey feedback is relevant here as it's really the circuit building/calibrating activity that is being discussed. L456-7: While good to hear, I don't think that feedback on the instructor for a single course is relevant here. I recommend that the author just focus on student feedback related to the circuit activities. L562: I'm not sure that the inclusion of information on the 3D watersheds is helpful in this paper since the focus is really on the circuit building. L574-620: I recommend trying to shorten the Conclusions. There is information in here that could be placed back in the Discussion (e.g., recommendations for future classes). Figure 3: I suggest choosing just one of these photos.

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