

Interactive comment on “STAGE 2.0: Sensitivity Transfer Analysis of Greenhouse Emissions” by Peter O. Passenier

Anonymous Referee #2

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This article presents the conceptual and technical background to a simulation tool designed to explore the sensitivity of the Earth climate system to human interference. Communicating and conveying the critical thresholds and feedbacks within the climate systems to non-specialists is a laudable objective, and the aim of the study is to 'describe the realization of an educational simulation tool' ...'which offers students the possibility to explore climate sensitivity'. The set-up therefore is the exploration of a pedagogic tool, based around the concept design of 'learning as experimenting'.

The difficulty is that the educational framework for the study and the pedagogic context that it is applied to are not discussed - the simulation tool is vaguely described as being for 'students in higher education'. There is no discussion of the level of these HE students (introductory vs advanced, general vs specialist), how the tool is expected to be

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used by students and educators, and what level of prior knowledge or understanding of climate science is expected from them. Much of the paper is at a fairly advanced technical level, and it is doubtful that anyone without a reasonable working knowledge of climate models would follow its thread (and I'm fairly sure would be beyond the general science-informed reader). Moreover, there is no discussion of other climate simulation tools that have been used in educational settings, or of educational studies that have pursued this learning as experimenting approach. The abstract mentions common misconceptions but what are these? - they ought to be far more clearly signposted in the text, being implicit in the discussion rather than explicitly highlighted.

Thus, despite being pitched as an educational tool, the educational basis of this study is not developed. To be of use to the educational community, one would expect to see some degree of evaluation of the effectiveness of this simulation tool in improving the understanding of 'students' in climate sensitivity. There does not seem to be any indication that this simulation has actually been trialled and tested on the intended audience.

In summary, the manuscript does a poor job of explaining who it is for, what its objectives are and what its key messages are. As noted above, this is essentially the technical outline of a simulation tool, with much of the substance relating to explaining how sensitivity was defined and operationalised within the software. In that regards, as an exemplar of an innovative numerical simulation, this paper would perhaps be better suited to a technical 'geoscience and computers' journal. But in terms of helping to communicate climate sensitivity to non-specialists, far more attention needs to be given to demonstrating its pedagogic rigor and practical efficacy. To do that would require a fundamental re-focusing and re-organisation of the study, which is too large a task to be major revision, hence my recommendation to reject.

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