



EGUsphere, referee comment RC3
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Comment on egusphere-2022-967

Anonymous Referee #3

Referee comment on "How you teach changes who you reach: understanding the effect of teaching modality on student engagement, content interest, and learning in undergraduate hydrology" by Christine Georgakakos and James Knighton, EGU sphere, <https://doi.org/10.5194/egusphere-2022-967-RC3>, 2022

This is an interesting study that queries whether changing teaching modality impacts student-instructor interactions (really novel, very cool) and student learning. As an instructor, I really liked the emphasis of this study on interactions/questions – I think this is an interesting way to frame an analysis of this type. My only caveat to my comments is that I am not well versed in statistical analyses applied to educational assessments, so I am not able to comment on this part of the paper.

Major comments:

-I'd recommend revising and restructuring the introduction. The introduction has lots of good content, but felt a little disorganized, jumping around between general information and more specific hydrology information. There were also a few ambiguous statements in the introduction that I think could be sharpened (more in minor comments).

-A minor point, but I consider it major, given the focus of the study – the term 'student led learning' is introduced in the introduction, but not defined or explained. I think it's worth adding a few sentences to more clearly define this term and point to key references. This would broaden the introduction of this idea beyond only the 'flipped classroom' approach.

-I'd strongly recommend moving Table S3 to the main text – otherwise it isn't clear from the methods what questions are being used for assessment.

-While very interesting, my main concern is that this is only one year and one class of data. Thus, findings could be specific to those circumstances, and it is hard to say if this outcome would occur in another class and another year. However, I don't think that means this study should not be published. Instead, I'd encourage a thorough discussion of the limitations of this study in the discussion section.

Minor comments:

Lines 39 – 40: "A recent series of interviews with water resources professionals indicated that graduates lacked critical workforce skills" – Could you add a little more information here? As written, I think this statement could lead to some confusion.

Lines 49-50 aren't well integrated with the rest of the paragraph, which is about student-led learning – should these ideas come up later? Or could they be better connected to the rest of the paragraph? (Maybe move down to line 71?)

Line 59: What is meant by 'more relevant material'? Could you be more specific here? Relevant to what and in what context?

Line 83: Another challenge in what respect?

Line 100: 3000-level is institution specific – (my institution uses 300 level, for instance) – could you use another way to contextualize the course level that translates across institutions? Maybe just refer to this as 'upper level'?

Line 125: 'on campus' might be too colloquial – maybe 'local'?

Line 243: worth looking at interquartile ranges? Did you bring the lower grades up with the shift in teaching modality?

Line 293: should this be 'reported'?

Line 294 – 296: I like this conclusion

Line 298: have other studies done this? Is this an approach that is used in the educational literature?

Line 310: Yes – I think this is possible. I've seen students doing group work divide and conquer on assignments, meaning that they may miss out on learning because they have self-selected to do a portion of the assignment that doesn't involve "x" activity.

Line 325: References got a little messed up here!

Figure 2: Could you update the legend to have spaces and be written text, not abbreviations?

Figure 3: Is it possible that interest in a career in hydrology merely increased through time, and not as a result of a particular approach to teaching? I don't think your study design allows you to separate temporal effects (if my assumption that the delivery timeline was lecture -> modeling -> design project), so it may be worth pointing this out (but my assumption may be incorrect).

Figure 4: I love a good figure, but I struggled to see what the authors wanted me to see in this figure. Would there be some way to highlight a key message, or include a number or a few numbers with each graph, or even a summary of the key takeaway message in the caption?

Figure 7: Could be moved to supporting information – I found this the least interesting! It was challenging to see anything in this figure. I also think this figure could be redesigned if you wanted to include it in the paper. For instance, add the question text above each section (so readers aren't flipping back and forth between different parts of the manuscript), and add significance level from the statistical test to each figure.