Reviewer’s report

Title: Comparison of the effectiveness of lectures based on problems and traditional lectures in physiology teaching in Sudan

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Reviewer: Maria Weurlander

Reviewer’s report:

The authors have compared the effectiveness of two types of lectures in physiology: one type that is based on problems and one type that is traditional. The topic of the paper is of relevance since lectures are still common in higher education around the world. I have a few concerns and suggestions for clarifications, which would help to improve the paper.

Although the introduction describes relevant literature regarding lectures in medical education, I lack some definitions and contextualization of the topic. For instance, the authors do not offer a definition of "effectiveness" with regards to the different types of lecture investigated. What is effective teaching? And what is effective learning? Neither do they elaborate on the use of lectures as one of several teaching and learning activities in medical education and the fact that students' own learning process or strategies influence their learning significantly. That said, I still think the paper offers interesting results. But they could be discussed in a wider perspective.

The authors describe the methodology adequately. However, I wonder about the quizzes used in the LBP setting (as described in step 7, page 8). There are several differences between LBP and TL. What is actually contributing to the higher scores and satisfaction among students in the LBP setting? Could the use of quizzes be a kind of test-enhanced learning (see for example Larsen et al, 2008, Test-enhanced learning in medical education. Medical Education, 42: 959-966)? Or is it the problems that students discuss during the lectures that influence their learning and attitude? I would appreciate more discussions on these aspects in the paper.

I also suggest that the authors clarify what kind of knowledge the quizzes used in both settings focus on. Factual knowledge or comprehension or application? Is there a difference between the groups regarding kinds of knowledge? This could help clarify the results and explain more than just stating that the scores in the LBP setting were significantly higher.

The study was approved by an ethical committee (good!), but the authors do not describe any ethical aspects of the study. I think this should always be clarified in educational research. What relation do the authors have to the students? If the authors also were teachers, this should be clearly stated and also how issues of power and informed consent was managed in the study.

The results are described clearly and thoroughly. I appreciate that the results presented both in text and in tables. It makes it easy for the reader to get an overview of the results. However, I am not sure about the third column in table 1 (In both equally). What does that mean? Mean value? I am not sure what this information adds. Please explain or remove. I also think that the figures
(1-3) are not necessary since the same information is in table 1. These can be removed. The same can be said about figure 4 and 5 and table 2. Use the table or the figures. Both are not necessary.

The findings are discussed in relation to the literature in the introduction. But, as I mentioned above, I think more can be discussed based on this study. The character of the knowledge assessed in the quizzes, and what could be contributing to the enhanced effect - the problems discussed or the testing. Or both.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

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