Author’s response to reviews

Title: Interactive whiteboard use in clinical reasoning sessions to teach diagnostic test ordering and interpretation to undergraduate medical students

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Author’s response to reviews:

Cover letter with point-by-point responses to the comments: BMC Medical Education - MEED-D-19-00159R1. "Interactive whiteboard use in clinical reasoning sessions to teach diagnostic test ordering and interpretation to undergraduate medical students"

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A/ Technical Comments:

- rename "Introduction" to "Background"

The change has been made in the revised manuscript

B/ Editor Comments:

Dear Authors,

Thank you for a thorough response to our comments. Your revisions have substantially improved the quality of the manuscript. There are still some issues open (mainly regarding readability of
the report) outlined in detail by Reviewer #2. Please find the points listed below and added as comments in the attached pdf file.

There are also a few minor editorial comments:
1. Page 11 line 60 (added in response to Reviewer #1). There must be an error in reporting the p-value (p=0.001) in the test investigating the difference between 70% and 72.5%.
2. Page 10 line 56: Fischer's -> Fisher's
3. Page 24 line 24: Ref [16] was published 2015 (not 2005)
The changes have been made in the revised manuscript.

C/ Reviewer reports:
Denise Connor (Reviewer 2):
Again, I find this paper to include some interesting insights and useful information for those working in the area of clinical reasoning curricula, and I feel that educators will be interested in the techniques and results described. I appreciate the authors' response to feedback and addition of a Limitations section, as well as clarifying details about the study groups throughout (e.g. being more clear about who are truly being compared), and including additional supplementary materials in the manuscript. The language overall has also improved and is easier to follow. However, more work is needed to add additional clarity to the writing in some sections as I still often found myself tripping over the wording and having to re-read certain sections several times to be sure I was clear on the authors' points. I have made comments mainly as sticky notes (and occasional strike-thru's) on the attached manuscript describing my suggestions to improve the clarity of the manuscript further.

Thank you for your comments and expertise in the field. This is really an opportunity to improve our work, and to clarify the manuscript. The language has been reviewed with a US-English speaking research writer. I think your suggestion have improved the manuscript even further.

There are also a number of places where I believe the authors should soften their language/claims to more closely match the data this set of linked studies provides. In particular, in the limitations section, I am struck by the fact that the differential response rate is in fact a real issue, and the additional references which have been added regarding general response rates and differences between responders and non-responders in internet surveys, feel inadequate to explain away the limitation related to the differential response rates in this study. I think it would be preferable to simply acknowledge this limitation, and to suggest that future study is needed, rather than attempting to allay the relevant concerns these differential response rates bring up. That said, in contrast, the data showing the similarity between those who did and did not complete the final assessment (which is now highlighted in the limitations section) is more compelling and useful for readers.

Thank you for your comments that have prompted us to provide additional analyses to improve the comparability of the study groups. Indeed, the response rate is often a vexing issue in research studies that include questionnaires. Thus, many methodological studies have attempted to assess the response bias in different contexts. I simply wanted to provide the reader with a
small window into these works that clearly do not provide a definitive conclusion about the response bias in our study. Therefore, I have changed page 19 in the Discussion section:

“Second, the questionnaire response rate was 67% for the third-year students attending the IWB/CRL sessions and only 22% for other students from the third to sixth year, and this may have affected the validity of our findings. However, the response rates in academic studies are 55.6+/−19.7% [49] and lower than in our IWB/CRL students. Moreover, when non-responders in internet surveys were experimentally forced to answer, the differences between responders and non-responders were small (even when the response rate was <10% [50]).”

To:

“Second, the questionnaire response rate was 67% for the third-year students attending the IWB/CRL sessions and only 22% for other students from the third to sixth year, and this may have affected the validity of our findings. While the response rates in academic studies are 55.6+/−19.7% [49], response bias still remains an issue in research studies including questionnaires [50]).”

Finally, after this read, I am still unclear exactly how the post-assessment worked (the language makes me unsure whether these were one-on-one verbal assessments vs. group assessments), and feel this part of the study would warrant more description/specifics. Depending on how this part of the study was shaped, I am also imagining discussion of additional limitations may be warranted.

Replication is an important issue in research today, and it is indeed important to provide readers with all the elements to reproduce our observation. The assessments were performed in a group, and the students were asked to answer in a written and standardized form.

Thus, I have added page 9 in the “Methods” section the word “group” in the sentence:

“At the beginning and end of their clinical placement, the third-year medical students were invited to attend a 1-hour group assessment session (optional).”

In addition, I have replaced the sentence on page 9:

“the students were asked to suggest hypotheses and then diagnostic tests (specifying the indications, risks, limits and modalities). Each case presentation was thus followed by two or three diagnostic tests, and the students identified and interpreted the tests, specifying positive and negative signs (if possible). The assessment session was supervised by a teacher. The correspondence between the diagnostic tests and the hypotheses, as well as the classic test indications, were reviewed.”

With:

“the students were asked to write their hypotheses and then diagnostic tests (specifying the indications, risks, limits and modalities) in a standardized form. Each case presentation was thus followed by two or three diagnostic tests, and the students had to write their tests interpretation, specifying positive and negative signs (if possible). The 4 cases were the same (in terms of content) in the pre- and post-tests assessments. The assessment session was supervised by a teacher. In the student’s form, the correspondence between the diagnostic tests and the hypotheses, as well as the classic test indications, were reviewed.”
I hope my comments throughout the paper are helpful. While I have pointed out a number of places that need attention, I would additionally suggest finding a reader with expertise in style/grammar to review the paper before resubmission.

The manuscript has been reviewed by an experienced research writer for style and grammar. In addition, N. Kuster, MD, PhD, has expertise in statistics and has specifically reviewed the “Statistical analysis” section.