Author’s response to reviews

Title: A Comparison of Online versus On-site Training in Health Research
Methodology: A Randomized Study

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Author’s response to reviews: see over
To

The Editor
BMC Medical Education
Biomed Central Limited
Floor 6, 236 Gray's Inn Road
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Dear Editors,

Thanks for your comments on our manuscript entitled "Distance Learning to Build International Health Research Capacity: A Randomized Study of Online versus On-site Training", for consideration of publication in BMC Medical Education.

My coauthors and I have revised our manuscript in the light of the comments from three reviewers. We are uploading here three files, as follows:

a. Revised manuscript
b. Responses to reviewers' comments
c. Revised manuscript with changes tracked (compared to the original submission).

We hope that you will find the revised manuscript acceptable for publication. If you have any questions, please do feel free to contact me.

Sincerely,
Rakesh Aggarwal
Reviewers’ comments and authors’ responses to these

The reviewer comments are reproduced below in Roman font, and authors’ responses to these have been added in italics.

Reviewer 1 (Dr. Steven Lillis)

1. The prose under the heading 'Knowledge gains' seems to be at odds with the data contained in Table 2. For example, the prose states that tested biostatistics scores improved significantly immediately after the course and gives a p value of 0.001 for on-site and 0.009 for on-line and refers the reader to Table 2. None of this information is contained in Table 2 as the table is a comparison of the two teaching methods, not a comparison of each method against baseline. I would suggest that a new Table be inserted that does allow the reader to understand the significance levels of improvement taking each teaching modality separately.

   We agree with the reviewer. These p values were not shown in Table 2. The data for each group, format and time point were included in the Table, but p values for before-after comparisons were not. These have now been as a footnote to this table. There was no need for an additional data since the data were already in the table.

2. The assessment undertaken by the students needs more comment. It is implied but not stated that the assessment was the same for both arms and this needs clarification. There is no detail of the reliability of the assessment. Were standard psychometric measurements of the test undertaken such as Cronbach's alpha that would be reassuring to the reader that the test was reliable? What were the steps taken to ensure the test was valid?

   The assessments were the same in both arms. A sentence to indicate this was already in the manuscript (now highlighted in the revised manuscript).

   Formal pre-testing was done for the research ethics knowledge assessment but not the biostatics assessment. Items for the research ethics knowledge assessment were pilot tested with 50 students participating in short courses on topics other than research ethics. The close-ended questions (multiple choice, true/false) were coded automatically and open-ended questions were coded by the study team. Item discrimination (ID) was calculated for each item and poorly performing items were refined or eliminated. Based on these results, two comparable instruments were created and used as the pre and post course assessments. ID was calculated along with the Cronbach’s Alpha for each test. The three-month post evaluation included the best performing set of items from each assessment. The final version had a Cronbach’s alpha of 0.837. A manuscript detailing complete process of research ethics knowledge assessment is under preparation and is likely to be submitted for publication soon.

   The biostatistics knowledge assessment was not subject to formal pre-testing for this study. However, these tests were designed by faculty members who are very familiar
with teaching and evaluating the subject for the last several years. Further, the assessment used items that were based on questions that have been pre-tested and used by one of the authors (JM) for assessments in biostatistics courses he has taught for several years.

It is important to note that the above difference between the research ethics and biostatistics assessment tools would not be expected to make a difference since the assessments compared knowledge gains across formats of training within each domain, rather than between domains.

3. The methods are very well described and are appropriate. The methods are what makes this study both unusual and valuable in that objective measures of learning were used in the comparison. The authors may wish to consider adding a paragraph on Kirkpatrick's criteria of educational outcome and where this study sits with regard to it as this would provide a wider framework for the reader.

A paragraph on this has been added to the discussion section.

4. The words in the title "Distance Learning to Build International Health Research Capacity" are peripheral to the study. The authors could review the title of the paper to something like "A comparison of on-line with on-site learning – a randomised study".

We agree with the reviewer. The title has been changed in the revised manuscript.

5. The authors may wish to consider presenting some data on the financial implications of the two different methods of education delivery. In building capacity of services, the cost implications become a crucial component of feasibility. Indeed, the cost differentials in delivery mechanisms are the whole purpose of moving to on-line teaching.

Actual cost data are not available. A paragraph on this has been added in the limitations part of the 'Discussion' section of the manuscript. The reasons for lack of such data are detailed there.

Reviewer 2 (Dr. Clifford Packer)

1. In Tables 3 and 4, it is not necessary to include the raw data for the Leikert scale questions. I would recommend giving only the mean and standard deviation for each question for both arms of the study, and the p-values. This would make the information much more readable and easier to compare.

We agree with the reviewer that these two tables are quite large. However, mean and SD are not appropriate measures to summarize these data which are on an ordinal scale and quite skewed. We also tried to summarize these data using median (range); however, the data on the last few questions cannot be summarized even with that
measure since the optimum response was the middle one, and not towards one end. We thus believe that these tables should be retained as it is. Further, these tables form an important aspect of the paper since these provide comparative data on 'student satisfaction' with online and on-site course formats – an important outcome. If the journal finds these tables to be too large, it may consider moving these to ‘Online only’ section.

2. It is not clear to me from the text how the interactive sessions were done in the on-line courses. There were 8 interactive sessions in the biostatistics course and 5 in the ethics course, so this was a substantial part of both courses. Did students log in at pre-specified times? Did they meet together in groups to do the sessions, or was all work done on the students’ individual computers? How did they ask questions and get responses? How many of the on-line students actually participated in these sessions? How labor-intensive were these sessions for the preceptors? Presumably, this might be a less scalable teaching mode than simple on-line lectures because it might require more preceptors to answer questions live on-line with a large number of students. Please clarify in the Methods section and give some additional comment in the Discussion.

Details on these sessions have been added to the manuscript. The sessions were nearly as intensive for the moderator as a classroom class.

3. I'd like to see some data on the actual cost per student for the on-line versus on-site training. Cost advantages are given as one of the main reasons to pursue distance-learning, and the actual dollar figures for this study (if available) would lend more credibility to the claim. If there was no cost advantage with distance learning in this study because of the small number of participants, could the authors estimate the potential savings with larger numbers of students? Cost data would be of great interest to anyone actually planning to implement a distance-learning program.

Actual cost data are not available. A paragraph on this has been added in the limitations part of the ‘Discussion’ section of the manuscript. The reasons for lack of such data are detailed there.

Reviewer 3 (Vernon Curran)

1. I found this manuscript to be well written. The Methods are clearly discussed, however the authors should specify the study design, it seems to me to have been pre-post test study design. The authors provide a good description of the courses. More detail is needed on the tests which were used, specifically the # and type of items used on the tests. Results are clearly described.

The study design was a comparison of two groups to which study participants were allocated in a randomized manner. The two groups were compared for gain in knowledge (post-course score minus pre-course score).
Details about these tests have been added to the manuscript.

2. The main weakness in this manuscript is the superficial coverage of pertinent literature in the Introduction. The review of literature related to e-learning and CME/CPD needs to be enhanced considerably. The authors do cite 1 meta-analysis study of e-CME, however a more expansive review of the literature must be added. The integration of the findings from this study with the literature and knowledge in this field must also be expanded in the Discussion section. This is a well designed study, however I was left wondering what is the importance and significance of the study findings with respect to what we already know?

We have not included much literature review to keep the manuscript short. We have now added more such material to the manuscript.