Author’s response to reviews

Title: Experiences and Perceptions of Online Continuing Professional Development among Clinicians in Sub-Saharan Africa

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Please include a point-by-point response within the 'Response to Reviewers' box in the submission system and highlight (with 'tracked changes'/coloured/underlines/highlighted text) all changes made when revising the manuscript. Please ensure you describe additional experiments that were carried out and include a detailed rebuttal of any criticisms or requested revisions that you disagreed with. Please also ensure that your revised manuscript conforms to the journal style, which can be found in the Submission Guidelines on the journal homepage.

On behalf of the authors, I would like to thank you for the favorable review. We have addressed all the issues raised by the reviewers by indicating the changes using track-changes in the manuscript. Below is the point-by-point response to the issues.

We hope that this revised manuscript is now suitable for publication in your journal, and look forward to hearing from you.

Reviewer #1:

1. This is a paper on electronic learning and continuous professional development (CPD), which is represented by a large body of literature including systematic reviews (see: Davis DA. JAMA. 1995; Cook DA. JAMA. 2008). The study topic is very important. However, a potential limitation of this study is that the background section is not contextualized within the medical education literature.
We appreciate this feedback as well as the suggested references which were very helpful. We have augmented our Background (pp. 4-6) to provide greater context on e-learning and online CPD, drawing from some additional, existing literature.

2. Background, first two paragraphs: It is true that an advantage of e-learning in the form of online CPD is an ability to reach non-traditional and distance learners. However, there have been previous studies on this topic (example: Frehywot S. Human Resources for Health. 2013). It would be helpful for the authors to cite these studies and provide further argumentation regarding how their study addresses an important gap.

We have included mention of this review (which we agree is important to note) in our Background discussion (lines 106-109), and provided further discussion on how our findings can contribute to this arena by noting previous gaps in the literature (pp. 5-6).

3. Background, last paragraph: The authors state that much of the CPD literature involves knowledge acquisition as opposed to learner preferences. However, this may not be entirely true. A MEDLINE search of "continuous medical education (exploded term)" combined "learning preferences (exact words)" yields 18 studies. Perusing these titles reveals relevant articles that could be cited in this paper.

We modified our statement regarding the CPD literature to acknowledge that there are indeed studies that have examined learner preferences in online CPD (lines 118-120). We have included mention of additional studies to enrich our Background and Discussion (lines 340-345) on learner preferences.

4. Methods, first paragraph: Please describe how the "convenience sample" was determined and details regarding its composition of HCW students.

We have provided more detail in the Methods section (lines 149-150) about our sampling. We sent out survey invitations to all students from the sub-Saharan African countries who had participated in our course from 2012-2016, on whom we had an email address and who were identified as medical or nursing professionals. In reviewing our invitation lists, we have corrected the previous denominator of 1,600 to 2,299 who were invited to take the survey.

5. Methods, first paragraph: invitations were e-mailed to 1,600 HCW students from 2012-2016. How many HCW students existed over that timeframe?

There were 2,696 students from sub-Saharan African countries who participated in the course over this timeframe, of whom 85% (2,299 not 1,600) were invited to take the survey. We have included this information in the Results (lines 194-197).
6. Methods, lines 112-120: What was the basis for determining the content of the survey items? Please insert details regarding survey, such as numbers of items and scales, within the text of the methods section.

We adapted our survey from a sample survey created by experts and published by the African Health Professions Regulatory Collaborative and note this in the Methods (lines 163-166). We have also provided more details regarding this survey as requested (166-171), “Our questions were adapted from an example needs assessment survey provided by the African Health Professions Regulatory Collaborative as part of a “Toolkit for Developing a National CPD Framework” in April 2013 {The African Health Professions Regulatory Collaborative, 2013 #459}. Although the survey was not formally validated, it was designed by experts in the CPD field as part of a package of tools to help practitioners and policy makers identify more effective CPD teaching methods and prioritize CPD learning needs of nurses and midwives {McCarthy, 2014 #458}.”

7. Methods, lines 112-120: Is there validity evidence for the survey instrument scores?

We do not have evidence of the validity of this survey, although we believe that it would meet the criteria for content validity due to the development of the example tool by experts in the field. We now note in the limitations this lack of formal validity, “Lastly, the survey employed for this exercise was not formally validated; however, we believe that the questions utilized were informed by experts in the CPD field and, therefore, are useful to help inform the future direction of online CPD.”

8. Results, line 126: The response rate is very low at 29%.

Our response rate with the corrected denominator is 20%. We acknowledge our response rate is low but it is on par with the 12-30% rates we noted in comparable survey-based studies of health professionals. This limitation is noted among other limitations of the study on page 18.

9. Results, line 126: The authors are encouraged to compare demographic and other characteristics - which should be available from the course directors - of survey respondents and non-respondents to possibly mitigate the low response rate.

We agree that it would be interesting to expand the comparison to include additional demographic data. However, responses to our survey were submitted anonymously and could not be linked to our course database to compare respondents versus non-respondents. We also did not collect age or gender consistently across the years. However, the distributions of job types and age or gender (when available) were comparable between respondents and the overall cohort of students from 2012-2016. We have noted this in our Results (p. 8).
10. Results, lines 170-172: It is stated that an open-ended query was administered and that key themes were reported; yet the abstract indicates that the study utilized "simplified grounded theory." Please provide more details regarding the qualitative methodology utilized in study. How were the "key themes" identified and abstracted? How many investigators were involved in the thematic analysis? How were discrepancies resolved?

Thank you for noting this omission. We have added more detail to the Methods section (lines 177-189) regarding our thematic analysis to aid the readers to better understand the methods.

“The responses to the open-ended request for comments were coded in MS Excel using a simplified grounded theory approach [Strauss, 1990 #441; Glaser, 1992 #456], an iterative approach to generate themes from the qualitative data. First, one qualitative researcher created a set of overarching codes from the answer categories illustrated from the data. Then, upon a second review by the same researcher, supplemental themes were added to both complement and provide contradictory insight. Responses were categorized and summary tallies shared with other members of the research team to help ensure neutrality and representativeness of the findings.”

Reviewer #2:

Thank you for sharing this article. Understanding health care workers experiences with online professional development certainly could revolutionize the speed of knowledge translation and continuing education in sub-Saharan Africa. As you note in your limitations, because of the online survey methodology, this study can only be generalized to those who have adequate internet access and internet savvy to complete an online survey. I would be interested to know how much of the health care workforce in sub-Saharan Africa would fit those categories (perhaps extrapolating from age distributions, percentage rural v. urban, % w/ access to smart phones, etc.) I think your methods are sound given the geographic and internet access realities of conducting follow up surveys. I thought the excerpts of survey comments were helpful in providing more in depth participant perspective. In reading the paper, I would like to have a bit more background information about the state of professional development (or whether formal professional development exists) currently in the fields of TB/HIV. Is there any standard curriculum for those working in the field? How is it currently delivered? How does the care most commonly delivered compare with the standard of care in the field? Grammatically, I would suggest replacing most likely in line 217 with especially.

We thank the reviewer for their feedback and for the suggested word change which we have made (p.13). We have expanded the Background discussion of CPD as requested also by the first reviewer – believing that is now provides more background for readers on the state of CPD.

How representative our participants may have been compared with health care workforce in sub-Saharan Africa overall is an important question but challenging to answer in detail given the diversity of countries and cadres. We do note the limitations of extrapolating our findings to all other countries, settings, and cadres would be inadvisable. The WHO has published some general statistics regarding HCW density and rural/urban distribution which suggests that our 2:1 ratio for urban: rural is comparable to what is known (http://www.who.int/hrh/migration/background_paper.pdf) but there are no readily accessible
population-based data regarding the age distribution or mobile/internet access among these workers in these countries.

Sadly, there is no current standardized curriculum for HIV/TB in the field. Therefore, it would be difficult to answer the questions of how CPD is currently delivered or how the care most commonly delivered compares to the standard of care in the field. There is wide variability of practice and lack of resources that catalogue in a comprehensive manner the current state of CPD or clinical care in these countries. Although an additional and expanded comparison of CPD in general across more countries, settings, and cadres would be very informative, we believe addressing these latter questions is beyond the scope of our current study.