Author’s response to reviews

Title: Transition to active learning in rural Nepal: an adaptable and scalable curriculum development model

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Re: Reviewer response letter for re-submission to BMC Medical Education

Dear Dr. Choi-Lundberg,

Thank you very much for this detailed feedback. Below we addressed the helpful reviewer and editor comments, point-by-point:

Richard Stark (Reviewer 1):

The manuscript now addresses all relevant concerns

Stephanie Dowling (Reviewer 2):

First of all well done on this body of work which is important to publish and is relevant to other countries.
-> We greatly appreciate this positive feedback on our work.
In the abstract first sentence you state "Traditional medical education has emphasized passive learning" Does this apply to Nepal? I was unclear regarding this.

-> Thank you for bringing up this ambiguity. Based on prior feedback, we were intentionally attempting to not single out Nepal, as passive learning was historically the cornerstone of education in the Western world as well. We have rephrased the statement, in the first sentence of the abstract, in hopes of clarifying: “Traditional medical education in much of the world has historically relied on passive learning.”

In the methods section you talk about "Mid Level providers" and after reading your manuscript several times I am unclear what they do. You provide a description in the introduction regarding qualification but please can you explain to the reader what does a mid level provider do in a hospital which will then be relevant for their educational requirements. What is their role and what education do they need to provide this role. Do they care of patients, prescribe, what do they do?

-> Thank you for this comment. It is easy for us to overlook the fact that mid-level providers have different roles and scopes in different settings. We have added the following sentences to the ‘Methods’ section, sub-section ‘Study setting’, 2nd paragraph: “Mid-level providers are tasked with diagnosing and treating a range of common medical conditions. Mid-level providers provide direct patient care in outpatient clinics, emergency departments, and inpatient wards. In addition, they perform minor procedures, and have prescribing privileges. At BH, mid-level providers receive direct supervision from staff physicians via daily rounds in the inpatient and emergency departments. In the outpatient clinics, mid-level providers act more independently, with physician consultation upon request only.”

In the methods section you use the word traditional didactics, please can you clarify what is meant by this?

-> Thank you. We have added a sentence to the ‘Methods’ section, sub-section ‘Problem identification and needs assessment’, 1st paragraph, to be more explicit in our use of the term ‘traditional didactics’ as it applied to our setting: “Lectures were delivered as traditional didactics, meaning a staff physician would deliver information compiled on a slide set, with minimal participation or discussion by learners.”

I would also remove the work understandability, and use another word, what does this word mean in this context?

-> Thank you for pointing out this weakness and ambiguity of the uncommonly used term ‘understandability.’ It was related to a lecture evaluation question, which asked participants to rate on a 4-point scale whether: “The lecture was easy for me to understand” (Additional file 5). We have removed the word ‘understandability’ from the ‘Methods’ section, sub-section ‘Evaluation and feedback’, 3rd paragraph, replacing it with the following sentence: “Two questions focused on whether the lecture was easy to understand, and whether it was relevant to their work. These questions utilized a 4-point Likert scale.” In the Abstract, ‘Methods’ section and in Table 1, the word understandability was changed to the term: “ease of understanding”.

In the methods you talk about mid level providers, again what do they do?

-> Thank you. We hope this was sufficiently addressed above (‘Methods’ section, sub-section ‘Study setting’, 2nd paragraph).
Please can you expand on lecture audits in the methods and results section. I did not understand how exactly audits were carried out after reading the manuscript, did both SM and LW time these audits and what was the level of agreement between them?

-> Thank you for pointing out the weaknesses in our description of the lecture audits. In order to address multiple reviewer comments here and below, we have elaborated significantly in the ‘Methods’ section, sub-section ‘Evaluation and feedback’, paragraph 4: “Additionally, lecture audits were performed in real-time using convenience sampling of lectures by one of two clinicians (SM and LW). Auditors observed lectures in real-time, using a stopwatch to record the total lecture time, as well as the learner talk-time. Audits were performed discreetly, and participants were not aware which lectures were being audited. Definitions for talk-time were agreed upon by auditors in advance. Learner talk-time was measured as the proportion of time in which learners were speaking (asking a question, responding to a question, or participating in discussion), or in which the presenter awaited a response to a question.”

In the methods section, under educational strategies, the last sentence is unclear how you came to this conclusion, can you expand on how individuals were asked to prepare and deliver the lectures. Were they given a guide regarding how to do this or educational resources to do this?

-> Thank you and we appreciate this important question. The following sentences, in the ‘Methods’ section, sub-section ‘Educational strategies’, paragraph 1, summarize the resources provided to presenters: “We created detailed and structured PowerPoint templates according to evidence on lecture effectiveness and cognitive load theory [29-31], to focus on clarity, visibility, relevance, simplicity, and audience engagement. Templates guided presenters to focus on common diagnoses and problems, and towards use of educational objectives, clinical cases, discussion questions, visual learning aids, repetition, and key learning points.” Additional files 2 and 3 show examples of these templates, both generically, and for a specific lecture.

Under evaluation and feedback 307 Exam results were stratified by level of training and system blocks, to allow for internal evaluation. Please can you explain this? I don't understand this

-> Thank you for noting this unclear statement. We have removed the term ‘system blocks’, as it is not relevant to the paper. We have elaborated on the purpose of stratifying exam results in the ‘Methods’ section, sub-section ‘Evaluation and feedback’, paragraph 2: “Exam results were stratified by level of training, to allow for internal program evaluation. In this way we could assess the extent to which exam scores changed for physicians versus mid-level providers, to determine whether we were achieving our goal of targeting the curriculum to mid-level providers.”

Please explain how lecture audits were performed using real time by two clinicians, I was unsure how you did this after reading the paper

-> Thank you and we hope this was sufficiently addressed above (‘Methods’ section, sub-section ‘Evaluation and feedback’, paragraph 4).
In the discussion section Immediate feedback came through lecture audit results, lecture evaluation and verbal discussion, please explain did this occur in front of the class or was this one to one feedback.

-> Thank you for pointing out this important distinction. The above sentence, in ‘Discussion’ section, sub-section ‘Lessons learned’, paragraph 1, was changed to the following: “Teachers received same-day, one on one feedback through lecture audit results, lecture evaluation results, and verbal discussion.”

In the discussion section under limitations you talk about learner talk time is a crude marker, please expand on what constituted talk time and did the class participants know this was an evaluation that was being carried out by SM or LW, was the teacher or the participants blinded?

-> Thank you again for this. We hope this was sufficiently addressed above (‘Methods’ section, sub-section ‘Evaluation and feedback’, paragraph 4).

Christopher R. Stephenson, MD (Reviewer 3):

Thank you for the manuscript. A few thoughts primarily on the methods. You mention the increase in test scores from pre to post curricular. Please clarify if you used the same pre-test as the post-test and note this as a limitation if so. Also, if I'm understanding your methodology, the pre-test and post-tests were given before intervention and after the intervention. If that's the case, then the increase in test scores might have been from your learners simply going through a curriculum in general, not because of your intervention. It's then challenging to interpret if it's really your intervention that created the score lift. Did you assess pre-test/post-test on the previous curriculum? This could have served as a control for your intervention.

-> Thank you for bringing up these important limitations in our evaluation. In order to more fully acknowledge these limitations in the manuscript, we have added the following statements to the ‘Discussion’ section, ‘Limitations’ sub-section, paragraph 2: “The pre- and post-curriculum exams were administered 6 months apart, but were identical, which may have affected the score improvements noted. Additionally, we did not have a control arm to determine how the new curriculum might have compared with an alternate curriculum. Furthermore, it is not possible to infer which components of the curriculum were effective based on exam results.”
Also, You mention that "Nepali and U.S. physicians developed the multiple choice questions to ensure relevance, validity and readability." How did you do this? Did you pilot test to ensure readability? How did you derive the content? Why 33 questions? What framework for "validity" are you referring to?

-> Thank you for these thoughtful questions. It is clear we did not describe our exam development in sufficient detail. The following statements have been added to the ‘Methods’ section, ‘Evaluation and feedback’ subsection, paragraph 2: “We developed an English-language multiple-choice knowledge assessment exam. Nepali medical leadership and U.S. physicians developed 1-2 multiple-choice questions from each lecture. Questions were based on key points and learning objectives from lectures. All questions were pooled, reviewed and edited by medical team leadership via an online project management system, to ensure best practices were used [33]. From the total pool of questions, 33 were selected for the exam, to ensure participants would have time to complete the exam during a standard 45-minute CME session. Questions were intentionally drawn from all blocks of the curriculum. The exam was administered to mid-level providers and physicians only, prior to and following the first curricular cycle.”

Lastly, although you state that you included response rate on your surveys, I'm still struggling to find where this is in your results. Perhaps label this clearly in the results section as, "total survey response rate was n."

-> This is an excellent point. We added the following statement to the ‘Results’ section, paragraph 2, to clarify why result rates could not be calculated: “There was a slight drop in evaluations received over time, with an average of 26.2 evaluations per lecture for months 1-2, compared to 22.1 evaluations per lecture for months 5-6. We are not able to calculate the more meaningful evaluation response rates, as we do not have reliable denominator data for the total number of staff in attendance at each lecture. This number depended on leave time and other variables.” Additionally, the term ‘response rate’ in the 1st paragraph of the ‘Discussion’ section, ‘Limitations’ sub-section was used in error. We have modified this statement to remove the erroneous term: “The decreased number of evaluations received per lecture over time also suggest survey fatigue may have contributed. Though we cannot be certain of this conclusion without evaluation response rates.”

Editor Comments:

Please address all comments from Reviewers 2 and 3 in your revision. In particular, Reviewer 3 raises a methodological concern relating to pre- and post-test occurring with the novel curriculum, but not for the previous curriculum; please address this in the limitations section of the discussion. Reviewer 3 also asked about response rates to surveys; I note you provide number of responses at lines 349-350, if you could provide a denominator for these (from the staffing data at lines 186 to 189 I suspect about n=60) and calculate percentage response rates, that would be informative.

-> Thank you for this important point. The denominator was left out as we did not have reliable data. This importantly limits the usefulness of conclusions which can be drawn from this data set. We hope this has now been sufficiently addressed in ‘Results’ and ‘Limitations’ sections of our manuscript. Please see our response to Reviewer 3’s last comment.
Please also fix references (this may have to be done manually if the BMC Med Educ referencing style is not cooperating): journal abbreviations #5 SEAJME maybe should be South East Asian J Med Educ; #6 Acad Psychiatry; #11, 16, 19, 24, 28 Med Teach; #12 JEE perhaps should be J Electr Eng; #13, 35 Proc Natl Acad Sci U S A; #15 IETI probably Innov Educ Teach; #26 Glob Ment Health; #37 Educ Leadersh.

-> We apologize for these reference errors. All references mentioned above have been corrected.

Once again, thank you for your support and please do not hesitate to reach out with any questions or concerns.