Reviewer's report

Title: Development of a brief learning environment measure for use in healthcare professions education: the Healthcare Education Micro Learning Environment Measure (HEMLEM)

Version: 0 Date: 19 Nov 2019

Reviewer: Marko Zdravkovic

Reviewer's report:

Authors present the development process of a new short and hopefully universal measurement tool for student perception of clinical micro-environments. The manuscript is interesting indeed, yet there are some limitations which need to be addressed before disseminating their findings.

MAJOR:

1. I would strongly discourage the use of acronyms in the title; please rewrite and improve the clarity of the title (bear in mind, that it has to include essential words so search engines will find your paper after publication easily)

2. Please define explicitly in which healthcare students did you pilot the tool and from which fields were the educationalists. Please see under minor comments the two solutions suggested: a figure as a flowchart of the item reduction process from the start till the end and a table with numbers and professional groups

3. I would suggest mentioning in discussion that students themselves can contribute to the educational environment (role of student engagement, importance of closing the loop of communication after collecting the data by your new tool and explaining to students what was changed based on their input). In this way you refer back to your introductory sentence: Finally, the act of asking for students' feedback on the learning environment can in itself contribute to a more positive environment, by showing students that their opinions are valued (8).

By doing so, these are better aligned with student needs and the students are much more likely to report their experiences in future audits. Suggested references (suggested only, feel free to use these or any other related to the point raised here):


This (communicating the changes made based on the prior feedback) is the key principle to keep them engaged with the evaluation tools.

Please note, the suggested references are the ones immediately available to me so your decision on their inclusion or not is not and will not be reflected on my review opinion. They are to serve as an example for the suggestions raised in the review and it is entirely up to the authors to find the appropriate references for the points raised.

MINOR:

1. ABSTRACT

Suggested abstract changes:

Background

The learning environment impacts many aspects of healthcare education, including the student outcomes. Rather than being a single and a fixed phenomenon, it is made up of multiple micro learning environments. The standard clinical learning environment measurement tools do not consider such diversity and fail to capture the micro learning environments. Moreover, the existing tools include over 40 items and may take a prohibitive amount of time to complete properly. This leads to hindered educational improvement strategies. Moreover, we do not have a universal tool which could be utilised across several healthcare student groups and their placement settings.

Aim

To create an evidence-based measurement tool for assessing clinical micro learning environments across several healthcare profession student groups.

Methods
The measurement tool was developed through a step-wise approach: 1) literature review with iterative analysis of existing tools; 2) generation of new items via thematic analysis of student experiences; 3) a Delphi process among healthcare educators; 4) piloting of the prototype; and 5) item reduction.

Results

The literature review and experiential data from healthcare students resulted in 115 and 43 items respectively. These items were refined, leaving 75 items for the Delphi process, which produced a prototype with 57 items. This prototype was then completed by 257 students across the range of healthcare professions, with item reduction resulting in a 12-item tool.

Conclusion

This paper describes a mixed methods approach to developing a brief micro learning environment measurement tool. The generated tool can be used for measuring student perception of clinical environments across several healthcare professions. Further cross-cultural and cross-professional validation studies are needed to support a widespread use, possibly through mobile application.

2. BACKGROUND

is relatively long - consider shortening and making your points clearer/more explicit with less words.

3. METHODS

3a. setting - elaborate on online platforms used for new data collection, how did you control for duplicate responses, ensured anonymity etc..

3b. what is grey literature and ancestral searches / please be clear.

3c. what is HEE? Please think about the number of acronyms used, especially those which occur only a twice or three times.
3d. As they were drawn from a much wider range of professional groups: not clear what is the actual range. I suggest you list all healthcare professional groups found in literature search and those who participated in online survey - use a table as a format of presenting or clearly list them in the methods/results sections.

3e. "new items that overlapped or duplicated existing items were prioritised" this sentence does not make sense and is unclear, please explain better

3f. suggest you replace the ref. 24 (about clinical trials) with this one (as one practical example of the Delphi process - or alternatively find a conceptually similar one as suggested):


3g. "Individuals from variety of /.../education were invited to participate." You will need to be more exact (see the above suggestion for creating a table, you need to let us know who these individuals by background and professional group were

3h. please provide numbers on how many are ALL healthcare students and how was this achieved. Again, no data on their professional groups and frequency within each.

4. RESULTS

4a. never start a sentence with a number - if so write it out.

4b. please make a table with numbers - you have only 69 students and a range of professional groups which makes your generalisations to all of them questionable. How many per professional group would be needed to give opinion for the validity of the tool?
4c. I wonder if you could provide a figure with item handling instead of detailed descriptions in results (a figure is worth a thousand words in this case I think) / similar to CONSORT flow diagram; additionally, as mentioned create a table with professional groups and numbers as mentioned above

4d. in piloting you will have to write the denominator (even though it will be a very low percentage - then you explain in your discussion why you found it sufficient - did you observe saturation for example etc.)

4f. several sections would need a better writing to improve clarity

5. DISCUSSION
5a. the second paragraph reads like a conclusion - you need to discuss first, then at the end go to conclusions

5b. "The response rate (likely to be in the low single figures) means that those who responded may be different to the rest of the student population from which they were drawn." Please be specific, remove likely and provide denominators as mentioned earlier

5c. "if you have a smaller range of …" please cite

5d. add discussion on improving the buy-in in such surveys-tools as suggested under major comments

5e. Please provide a reference as an example of survey tools delivered through mobile applications.

Table 1: Sub-scale 2 - what about improving ones attitudes?
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

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

Unable to assess

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

No

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

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

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