Author’s response to reviews

Title: A simple and short microbiology practical improves undergraduate nursing students' awareness of bacterial traits and ability to avoid spreading infections

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BMC Medical Education,
Dr. Liam Messin, Editor

Dear Dr. Liam Messin,

Thank you for your e-mail of October 3th, 2018 and returning our manuscript “MS: RESN-D-15-00163R1/ Title: MEED-D-17-00780R2 A simple and short microbiology practical improves undergraduate nursing students' awareness of bacterial traits and ability to avoid spreading infections” with a decision. According to the reviewer’s comments and suggestions, we revised our manuscript properly. I attach here our revised manuscript with changes indicated by red hatching with underline, as well as a point-by-point response to the reviewer’s comments.
We believe that the revised manuscript is a suitable response to the comments, and is significantly improved over the initial submission. We trust that it is now suitable for publication in BMC Medical Education. We look forward to hearing from the Journal as to the acceptability of this manuscript. Thank you in advance for your kind consideration of this paper.

Sincerely yours,

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REPLIES TO REVIEWER’S COMMENTS

MEED-D-17-00780R1

A simple and short microbiology practical improves undergraduate nursing students' awareness of bacterial traits and ability to avoid spreading infections

RESPONSE TO REVIEWER 1

Comment 1: pag 5 line 76 "traduce (?of) hospital infections

Response: According to the reviewer’s comment, we modified the sentence in specific as follows (See underline):
Nurses are principally responsible for implementing appropriate measures to reduce hospital infections, especially with multidrug resistant bacteria

Comment 2: the sentence pag 5 lines 79 - 80 should be rephrased.
Response: According to the reviewer’s comment, we modified the sentence in specific as follows (See underline):

Meanwhile, the contents of microbiology courses in nursing classes are generally based on knowledge because the course lacks in practical work such as forming bacterial culture or colony observation.

Comment 3: pag 6 line 98: a theoretical framework ?that? experiential learning consisting...
Response: According to the reviewer’s comment, we modified the sentence in specific as follows (See underline):

Furthermore, it is well accepted that a theoretical framework that can foster experiential learning consisting of a cycle with concrete experience, reflective observation, abstract conceptualization and active experimentation, can generate awareness strongly [15].

Comment 4: pag 12 line 242 " this may explain ?to? need advanced ...
Response: According to the reviewer’s comment, we modified the sentence in specific as follows:

This may explain the necessity of advanced practical for acquiring deeper knowledge about infectious diseases to nursing students.

Comment 5: table 1 Q1 : dirty or dirty? ; same problem in fig 2.
Response: Very sorry. According to the reviewer’s comment, we corrected “dirty”.

RESPONSE TO REVIEWER 2

Comment 1: I still have a problem in understanding the scoring system: were there "correct" answers to be selected by the student? For example, Question 1 has these 8 possible answers:
Bacteria can be either harmful (Salmonella typhii) or beneficial (enteric flora) and the suggested words seem to be more images to be associated to the concept of bacteria than "right" or "wrong" answers.

In Fig. 3 Q1 has an average score of 3.33 +/- 1.58 (by the way: what does Distribution of score 2.533 mean? Range between Min and Max score?).

Maybe you meant that the more words the students selected, the better the test was? Or the more "correct" words they selected, the better? And if so, how many correct choices were there for any question?

So the increase in Q1 was from 3.33 to 3.47 (actually a slight increase...) Am I correct?

Response: Thank you for your comment.

We apologize for the lack of explanation about the analysis and questionnaire responses. The questionnaire items have multiple choice answers. When the participants responded to the questionnaire, the correct answers were not allocated. For convenience, we assigned the correct answers when we estimated Cronbach’s α score. I would like to continue studying this validity in the future. Based on the reviewer’s comment, we have added an explanation about the statistical analysis and Table 1 and Figure 3 legends as follows:

Statistical analysis

Comparison between “rate after the practical” and “rate before the practical” was performed using statistical analysis with two-way ANOVA. Additionally, comparison among DIs was conducted using a Bonferroni/Dunn test. Additionally, diffract score (score distribution) was estimated using a function with VAR(x) installed into Excel. P-value of less than 0.05 was considered significant. Cronbach’s α score of more than 0.8 was considered as having significant validity.

We also modified Table1 and Figure3 as follows:
Table 1: For estimating Cronbach’s $\alpha$ score, “correct answer” that we expected are settled up into each of the Questions. Please see the legend of Fig. 3.

Please see the legend for Figure 3 below

Fig 3. Validity of items in questionnaires on estimating changes in awareness via practical. Upper panel shows psychometric properties including mean score, distribution scores, and Cronbach’s $\alpha$ score. Score distributions show diffract values (See the Methods section). Cronbach’s $\alpha$ score of more than 0.8 was considered as having significant validity. Lower panel shows the comparison of ID (difficulty index) among “Expected DI” (theoretically expected) (White bar), “Observed DI (pre)” (before the practical) (Blue bar), and “Observed DI (after)” (after the practical) (Red bar). The DIs were compared using a Bonferroni/Dunn test, but no significant difference was seen. “Q1-7” shows the items of questionnaires. See Table 1. Additionally, for estimating Cronbach’s $\alpha$ scores, the “correct answers” provided against each of the questions are settled up into each of the Questions as underlined items in Table 1.