Author’s response to reviews

Title: Prediction of Academic Achievement based on Learning Strategies and Outcome Expectations among Medical Students

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Dear Editor of BMC Medical Education

Blossom Yen-Ju Lin

On behalf of all authors of the manuscript entitled" Prediction of Academic Achievement based on Learning Strategies and Outcome Expectations among Medical Students" (MEED-D-18-00837), thank you for your attention and reviewers' valuable recommendations. We greatly appreciate your encouraging e-mail and the reviewers’ constructive and positive comments on our manuscript.

We have now revised the manuscript and explained point-by-point responses to each comment. The changes within the revised manuscript are highlighted in red fonts. In addition, here we tried to response to the reviewers' comments/questions here one-by one below of each comment, therefore, we have added some points according to the reviewers' comments on the current manuscript.

On the other hand, based on the reviewer's advice, Samy Azer, the revised manuscript was edited for proper English language, grammar, punctuation, spelling, and overall style by one of the highly qualified subject-expert native English speaking editors (the edited file with track changes and editorial certificate letter have been attached as supplementary file).
We hope you find the corrections satisfactory and have fulfilled the reviewers' expectations.

Yours sincerely,

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Responses to the comments raised by the reviewer

Editor Comments:

BMC Medical Education operates a policy of open peer review, which means that you will be able to see the names of the reviewers who provided the reports via the online peer review system. We encourage you to also view the reports there, via the action links on the left-hand side of the page, to see the names of the reviewers.

Reviewer reports:

Samy Azer, MD, PhD (Reviewer 1): I read with great interest the above titled article, however, there are major problems in the manuscript:

1. Introduction: What do the authors mean by "learning strategies" and "academic performance/progress", these two terms should be defined.

Response: Academic achievement is explained within the first paragraph of the introduction (highlighted). Learning strategies then is described in the first and the third paragraph.

2. Introduction: I cannot see any mention/discussion/explanation about learning strategies in the introduction.

Response: The explanation about learning strategies and the students' types of learning is added within the text in the third paragraph of introduction (highlighted).
3. What is the rationale of the study? What triggered this study? Why do authors think that learning strategy is an important factor? Provide evidence from the literature.

Response: As the learning methods/strategies have been discussed and emphasized in several studies, the more discussion about the rationale of the study, including, the importance and the reason of investigation in the present study among pre-clinical students of medical sciences have been added in the second, 7th and 10th paragraph of introduction, according to the related literature (highlighted). In addition, we discussed about learning strategies' effects on student's academic achievement based on our findings in the discussion section (highlighted).

4. Methods: What do the authors mean by "based on quota allocated to each faculty"? Who do decide? Why?

Response: The sampling method is more explained in detail in the method section (highlighted).

5. It is not clear how sample size was determined.

Response: The sample size calculation method and formula is added in the appropriate section in the method.

6. Methods: what do you mean by "questionnaires were provided to them and completed by self..." Which questionnaires? How did you prepare these questionnaires? Give the reference for the MSLQ questionnaire.

Response: Data collection method was re-organized for more clarification in method section, data collection sub-heading. In addition, more details about the origin of MSLQ and its preparation are highlighted in the study's instrument sub-heading.

7. What are the sources of the SDES and MSLQ questionnaires?

Response: The sources of instruments (SOES and MSLQ) were used in the present study are added in the method section, study's instrument sub-heading.

8. Are the 20 minutes to complete 3 questionnaires? How many questions were in each of these questionnaires?
Response: According to Pintrich et al. (1997) the instrument has been designed to be given in class and takes approximately 20-30 minutes to administer. Our study dominantly was administered in classrooms, in where questionnaire's completion took an average of 20 minutes.

9. What is AMOS?
Response: We added the "software" after the AMOS in the text. It is a visual program for structural equation modeling (SEM) that we needed for test the fourth study's hypothesis, because it performs computations for SEM and draws models graphically by simple tools.

10. You need to measure the validity and reliability of your tools.
Response: The explanations about psychometric properties of both scales have been added within the text in the method section, study's instrument sub-heading.

11. There is a need for a more valid measure other than students' views by completing questionnaires. While the students' responses can be part of the answer, they cannot be the only source. The method should include something measurable in addition to questionnaires such as end-point assessment or any similar measures.
Response: Although the MSLQ is a self-report Likert-type questionnaire it is a standard scale in which students rate statements about their motivational orientation and use of different learning strategies in a college course and has proven to be reliable and useful tool that can be adapted for a number of different purposes for researchers instructors, and students. It has been translated into multiple languages and has been used by hundreds of researchers and instructors throughout the world (McKeachie, W. & Duncan, T.G, 2010). As a faculty member and education researcher, we found MSLQ out very beneficial for our academic objectives and enables us to improve the teaching performance and students' motivational orientation.

12. Results: need to be organized.
Response: The findings were re-organized according to our study's objectives in appropriate subheadings and order.

13. The study has several limitations and they should be stated. The discussion should include discussion of findings in light of other studies in the literature.
Response: the limitations of the study are added at the end of the discussion. In addition, the main findings of the study are compared to the other new studies within discussion (highlighted).

14. The writings should be improved. Several statements have grammatical errors, spelling mistakes or not logical. For example, the conclusion, the first statement, "Knowlede the cognitive and metacognitive strategies in student learning skills on the one hand...". The whole manuscript should be carefully checked.

Response: The revised version of the manuscript was re-submitted to a native editor for proper English language, grammar, punctuation, spelling, and overall style by one of the highly qualified subject-expert native English speaking editors. The editorial certification letter has been attached as supplementary file. I hope that the new revised version meets the reviewer's concerns.

15. References: The authors is submitting their manuscript to BMC Medical Education, but I cannot see references from any of medical education journals such as BMC Medical Education, Academic Medicine, Medical Education, Medical Teacher, Advances in Health Sciences Education. The references are poorly selected.

Response: The new articles have been added into the references (highlighted) within the introduction and discussion from the journals including, The BMC Medical Education, Medical Teacher, Medical Education Online, Education Research International and Educational psychologist in the appropriate sections.

Thank you once more for your attention and merit recommendations.

Gary Beck Dallaghan, Ph.D. (Reviewer 2): This is a review of a manuscript investigating learning methods and motivation as it relates to academic achievement. The following review is intended to help the authors improve their submission.

In general, this was a well done study. You should number pages so the reviews can be more specific. Most of my comments are focused on the Methods section.
Methods:

First paragraph, lines 17-20: Why did you exclude people based on these issues of divorce or death? They certainly impact motivation and can impact learning. Did you think these would be noise in your analysis? You should explain in more detail why you specifically chose to exclude this group.

Response: The authors assumed that those crises could affect the precision of the participants' responses due to their emotional and mental conditions. However, we did not exclude them; instead, these criteria were considered as entering prohibition criteria.

For the instruments you used, you need to better explain their constructs. You reference the subscales in the tables, but have not taken time to explain them at all in the Methods. I don't know for sure how they are scored, what the subscale scores mean, etc. That's important for the reader to have so we know what these values mean.

Response: Details about MSLQ including subscales, scoring and validation has been added in the method section, the study instrument sub-heading.

At what level training were the students you surveyed? Were they in their pre-clinical education? Clinical?

Response: The participants were undergraduate students of years 2, 3 and 4 in one of medical sciences fields (pre-clinical for medical students), It is more explained in the inclusion criteria sub-heading in the first and second paragraph of the method section (highlighted).

Where were the surveys administered? In class? Were they paper surveys or via electronic administration?

Response: The questionnaires were administered in regular classrooms and were as paper form (it is explained in the method section, data collection sub-heading).
Results:

How did you get 100% response rates? That is astounding!

Response: Thank you, it was a very success for us in this study and we did not expect that all questionnaires were fully answered. The details about data collection and how the respondents were convinced to answer questionnaires is added in data collection sub-heading in method section.

Discussion:

The sentence reading: "The reason for this finding can be related...." lacks context. The statement does not fit with the rest of the paragraph and left me perplexed. Where did you identify negative expectations of their field of study?

Response: In Iran like many other developing countries, although students can only enter in medical sciences schools after passing a hard and rival national exam, specifically for medicine major, most of them will disappointed with the job opportunities after graduation. This issue might influence the expectations of the medical students and create hesitation about their own future. Therefore, the meaning of the last sentence was according to our finding in the study that indicates, "Outcome expectations were not a significant component in predicting students’ academic achievement". As we concluded that one reason of such a finding might be attributed to this issue. However, if the reviewer deems it necessary to omit that sentence, it can be deleted.

The two paragraphs that begin with "Ruffing et al. studied the factors affecting...." and "Thiele, however, studied the role..." are unnecessary. They did not add to the discussion.

Responses: Both paragraph were omitted and substituted by another studies related to the previous statement (highlighted within the text in discussion).

Conclusions:

The last sentence is not discernible from what you studied. You can't assume learning strategies equate to educational modalities. If you collected that data, I failed to recognize it in the
manuscript. Students will develop learning strategies regardless of the modality - so whether it's a lecture or a small group - they have a plan. The relationship is not causal in nature and that's what this sentence implies.

Response: The last sentence was substituted by better sentence to reflect the study's conclusions. Actually, the MSLQ is designed, to be used both for instructors/teachers and researchers and students. As the scale's scores may be adapted to the instructor's or researcher's need on how to increase their students' levels of motivation and learning strategies (it is stated at the end of the fourth paragraph of the method section). On the other hand, it provides feedback and suggestions to students on how to manage their learning methods regarding different courses. Furthermore, Duncan & McKeachie (2005) stated that, learning strategies can be learned in the classrooms and brought under the control of the student and learning strategies may vary as well, depending on the nature of the course. Teachers, as well as students, must learn how the use of personalized learning strategies contributes to learning including medical courses.

We thank you for all invaluable recommendations and considerations.

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Declarations

- Ethics approval and consent to participate
- Consent to publish
- Availability of data and materials
- Competing interests
- Funding
- Authors' Contributions
- Acknowledgements

Response: All the above declarations were considered in the manuscript orderly. In addition, the file includes raw data has been attached as supplementary file (highlighted in red).

Once more, the authors would like to thank Editor, Dr. Blossom Yen-Ju Lin, and reviewers, Dr. Samy Azer and Dr. Gary Beck Dallaghan for their helpful comments about this manuscript and hoping the revisions are met their concerns.