Author's response to reviews

Title: Predictors of students' self-reported adoption of a smartphone application for medical education in general practice

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Version: 2 Date: 12 April 2015

Author's response to reviews: see over
Reviewer 1:

The authors present the students’ perspective on a web-based prototype of a general practice textbook. The tool offers web-based (mobile accessible) texts, algorithms and lecture notes as well as self-assessment options. The assessment was conducted in the setting of a general practice course in undergraduate medical education. The study intends to identify predictors of students’ adoption of a smartphone application for medical education. This is highly relevant and generally of broad interest for the medical education community.

Response: Firstly, we would like to express our appreciation of your time and effort to provide feedback to our research. We have carefully considered your remarks and commented on them in the following passages.

Background

1. I suggest an additional literature research to include some more, relevant articles including Davies 2012.

Response:

Thank you for your valuable recommendation. We have carefully reread the background section and included more relevant articles, which we identified in a new literature research based on your proposal. We additionally shortened and simplified some of the previous formulations. Furthermore, we have done some restructuring to highlight the relevance of research on adoption. The newly included articles and sources in the introduction are the following:


Methods

2. The applied methods generally seem sound. A statistician should be consulted since I assume that for a logistic regression the independent variables are required to be independent from each other, which the authors don’t assume.

Response: The reviewer addresses the important aspect of multicollinearity in the context of regression analysis. Multicollinearity refers to the degree of linear interdependence among the independent variables of the regression model. A high degree of multicollinearity may lead to high standard errors of the estimated regression coefficients and to potentially instable results.
A certain degree of correlation between the independent variables is normal in practical research. Furthermore, it should be considered that a multiple regression model with “adjusted” coefficients (adjusted for the influence of the other independent variables) is only necessary if the independent variables are correlated to some extent. If they would be completely uncorrelated, the unadjusted coefficients of respective bivariate regression models and the adjusted coefficients of the multiple regression model would be identically. However, the degree of linear interdependence among the independent variables should not be too high. As recommended in the literature we examined potential multicollinearity in our data by analyzing the correlations between all independent variables previous to the regression analysis, analyzing the correlations between the estimated regression coefficients, and inspecting the standard errors. All those measures revealed no indication with regard to the presence of a multicollinearity problem.


3. In fact, the variables 1 and 3-6 in table 1 are of similar effect. The question arises whether there are strong confounders as mobile device ownership (72% vs. 84% in non-frequent and frequent users). The potential influence of such confounders should be addressed.

Response: We are not sure if we correctly understood this comment, but we would like to refer to our response to comment 2 (see above) and state again that there were no strong or very strong correlations between the mentioned variables. Furthermore, a multivariable statistical method was chosen to take the adjusted influence of different variables into account.

Discussion
The general structure is logical; the available data indeed are scarce.

4. This section needs to be reedited, though, as several subsections are worded in an unnecessarily complex, convoluted style (lines 194ff., 214ff., 219ff.). The authors may consider editing by a native speaker.

Response: We revised the discussion in general and especially the mentioned sections thoroughly to make it more easily to understand. We thank the reviewer for the helpful comment.

5. In lines 209 the authors should insert a new paragraph, as a potential connection of both sentences is confusing.

Response: We have carefully reread the sentences and agree with your comment. We have added a paragraph.

Limitations

6. The screenshot of the tool provided shows the responsive design, but it makes me wonder whether the tool makes full advantage of the potential apps provide or whether the former content of a textbook is merely made web accessible.

Response: As described in the manuscript, the app-content is based on a textbook. However, the functionality (links, search, mock up examination, relational content) go beyond those of a textbook. Since the current version is a prototype, not the full potential of an app can be demonstrated (e.g. due the lack of videos). Respective information was added to clarify this point in the manuscript (section description of the app).

7. A major limitation is that there was no assessment of actual use of the application with a mobile device or with a standard computer. Thus the title (adoption of a smartphone application) triggers high expectation regarding the assessment of the actual mobile use of the app – which the authors are unable to determine with the applied questionnaire. The title needs to be modified accordingly.
Response: The title was changed to address the comment. Additionally we have adjusted the wording throughout the paper and the abstract.

In conclusion: The paper addresses a highly relevant issue and is of broad interest. If the title is reworded and the discussion revised the paper should be suitable for publication.
Level of interest: An article of importance in its field.
Response: Thank you for your encouragement and evaluation of the topic’s relevance. We hope to have considered your comments according to your expectations.
Reviewer 2:
The authors investigated the factors associated with adoption of new communication technologies like smartphones or tablets by medical students during studies in general practice. The theme is interesting with regard to future development of new communication strategies in medical education.

Response: Thank you very much for taking the time to review our manuscript and provide constructive feedback. The theme is indeed interesting. We have carefully addressed your concerns.

1. The age range of the participating students was 21 - 35 years. In Table 1 there are means presented between “App 5 time or less used” and “App more than 5 times used”. These means are not very meaningful. The median would be much more informative. In addition, the authors could present a Figure “age versus use frequency”. It would be nice to see whether there is a negative or positive correlation between age and use frequency.

Response: Thank you for this comment. We added the information regarding the median in the table. We found no significant correlation between age and frequency of use, which is stated in table.

2. Table 5 should be presented as a figure, because the results are not easy to comprehend.

Response: We have carefully considered this comment and agree with you that an illustration as a figure is much easier to comprehend. Thank you very much for this recommendation. Figure 1 has now been inserted into the manuscript.

Minor point: Page 2 line 43: “24.5 years” instead of “24.52 years”

Response: Thank you for pointing out this mistake. We have changed it according to your recommendation.