Reviewer's report

Title: Reinforcing Outpatient Medical Student Learning Using Brief Computer Tutorials: The Patient-Teacher-Tutorial Sequence.

Version: 1 Date: 26 April 2012

Reviewer: Fredric M Wolf

Reviewer's report:

General

This report describes an evaluation of the effects of using tailored computer tutorials in an effort to reinforce medical students’ outpatient content/case-related clinical learning. This should be of great interest to medical educators who are interested in using technology-based resources to reinforce and augment students’ clinical experiences and learning.

Maor Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. As currently presented the authors describe a 2 x 2 ANOVA with 1 covariate (pretest). However, results are presented in Figures 3 and 4 as Tukey Box Plots separately for each content area, oral rehydration solutions (Figure 3) and FWS Topic (Figure 4). This raises the question of whether this should be a 2 x 2 x 2 ANOVA with content/domain area as another independent variable? It may be worth consulting a statistics text that discusses ANOVA simple (main and interaction) effects (e.g., BJ Winer or others). In looking at the supplemental information, the content domains and tutorials are very different, and there may well be significant main effect differences between them, as well as possible significant interaction effects. One tutorial is much longer and statistically oriented; the other is much shorter and more clinically oriented. Exploring possible differences between them in a more systematic way may be informative.

2. Some of the methods are described in the Results section and would logically fit more appropriately earlier in the report in the Methods section, e.g., “For our main outcome, we compared z-scores for all tutorial completions, irrespective of topic, constructing an ANCOVA model . . . being the independent variables and the relevant pre-test score as a covariate.” (p. 14); “For the ORS subscale, we analyzed these data with an ANCOVA where . . . while Pre-test score on the ORS subscale is a covariate.” (p. 15); “In the same way as for the ORS topic, we analyzed performance on the FWS topic . . . compared to doing it ‘out of sequence’ (i.e. without being activated by a case).” (p. 15); “As a planned subgroup analysis, we examined whether the time spent interacting with the tutorial varied based the study condition under which they did the tutorial.” (p. 16) Much of this is not described in the Methods section and is presented for the first
time in the Results section.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. I believe that Table 1: “Relevant Case - -” headings need only one minus sign, right?

2. Table 1: It is more informative to include degrees of freedom in parentheses with the F-statistic, e.g., F (df) = 4.0; p<0.05.

3. Fonts and formatting for the paper’s headings and sub-headings need to be consistent. There are also format inconsistencies among the references (use of capitalization of titles, use of italics, for some but not all references.

4. The last sentence of the “Sample Size” paragraph (p. 12 of 33) is grammatically incorrect and it’s meaning is not clear.

5. In the Results section for Baseline Measures (page 13 of 33), pre-post differences are reported for a sub-set of subjects, which don’t seem to fit under the heading “Baseline Measures”?

Discretionary Revisions (which the author can choose to ignore)

1. In looking at the Flow diagram in Figure 2, I can’t help wondering why the authors did not use a stratified random sampling approach in which smaller subgroups of subjects (say the first 4 subjects, the second 4 subjects, etc.) could have been randomized 1 each in random order to each of the 4 groups (FWS-In; FWS-Out; ORS-In; ORS-Out) so there would have been more equal sample sizes? Perhaps this is something to consider for the next study?

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

'I declare that I have no competing interests’