Author's response to reviews

Title: Assessment of an electronic voting system within the tutorial setting. A randomised controlled trial.

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Author's response to reviews: see over
Dear Editor,

Thank you for the comments from your reviewer on our manuscript entitled ‘Assessment of an electronic voting system within the tutorial setting. A randomised trial.

Our replies are set out below.

**Major Revisions**

The 102 students who enrolled in the study all come from one academic year and represented 93% of the students in that year. The students were randomly allocated into one of six groups and stratified for gender and academic ability (ie previous academic performance in the medical course). The randomisation was carried out by the secretariat in the medical school, who had no connection with the study. All of the students were in the age range 21-23 and had completed three years of medical school. We are confident that the groups did not differ in age, gender distribution or academic ability. We have added this information to the manuscript.

The results for pre-test for the ‘acute abdomen’ section of the study is likely to be a type II error, but as pointed out by the reviewer may be partially attributable to the reliability of the MCQs used.

The internal reliabilities of the three datasets (pre, post and 6 weeks) ranged between 0.40 and 0.53. These are excellent measures of reliability, even though they might be considered below the desirable value of 0.65 for groups. In our manuscript revision we have drawn attention to these results.

Examining the data from an IRT / Rasch point of view results indicates that the MCQs are making measurements of something in common, which acts as confirmation of consistency as well as validity in a sense.

**Minor revisions**

A summary paragraph has been added to the discussion section, which reads as follows

This study evaluated the place of an electronic voting system in the structured learning process of an undergraduate medical curriculum. Results showed that when used with students at the beginning of their clinical experience, this teaching and learning aid fostered enthusiasm for the tutorial and encouraged group participation. Quantifiable benefits were limited to a small improvement in retention of understanding of the topics tested.

An additional paragraph has also been added to the paper addressing the strengths and limitations of this study as follows

This study has a number of strengths. First, we were able to enrol the students from a single year of the clinical course and thus ensured an appropriate spectrum of academic ability. Second, the study was able to determine clear end-points and apply both quantitative and qualitative measurement in a ‘real’ educational environment. A weak point – which was recognised when the study was designed and which was unavoidable – was that it would have to run over an entire academic year over six different groups of students and therefore required smaller groups than would be desirable in an ideal situation. The authors feel this may have reduced the impact of the introduction of the EVS. The risk of different groups of students starting with different baselines, depending on how far along the course they had progressed when they did the study was tested and found not to have any confounding effect on the results. Time constraints imposed on the study by the medical curriculum meant that the number of questions, which could be imposed in the testing phase were not quite optimal.
Minor discretionary revisions (added to the manuscript)

Student interaction was measured by two independent observers. There was close correlation in their observations.

This study was conducted in a small group setting because it was planned to study one complete academic year. These students never met as a large class and therefore the only practical way of running the study was when the students were undertaking their six week surgical attachment and could be studied then in a block – albeit a relatively small one. In addition, there was only a limited amount of EVS equipment available – sufficient for 30 students.

Thank you once again for the consideration of our paper, which we believe is an important step in the measurement of the effects of introducing electronic voting systems into the classroom environment.

Yours sincerely
Edward Palmer, Peter Devitt, David Morris, Neville DeYoung