Reviewer's report

**Title:** Does Students' Preference of Test Format (Computer-based vs. Paper-based) have an Influence on Performance?

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**Reviewer:** Robert Brown

**Reviewer's report:**

In their article, “Does Students' Preference of Test Format (Computer-based vs. Paper-based) have an Influence on Performance?”, the authors have demonstrated that a computer-based examination (CBE) of medical students in genetics, when taken voluntarily, yielded equal results to a paper-based examination (PBE). The paper provides post-test opinions of the two groups about the format. These findings are important and offer the first step toward moving to CBEs.

**Major Compulsory Revisions**

1. As the paper is written, there is a perception of a bias on the part of the authors to find CBE equal to, or superior to, PBE for all exam takers. The criticisms of the PBE group need be dealt with by a subsequent study that isn’t voluntary to answer questions raised, or unanswered, by their data. I would favor sticking to the findings of equivalent test scores and greater grading efficiency, but admitting to some residual preference for PBE in that group.

2. The Abstract should be re-written with #1 above in mind. For example, its Results state, “The students with the CBE judged their examination to be more clear and understandable”, but the data to support this conclusion is not provided.

3. Also, the Abstract Conclusion states, “Students concerns of getting poorer results in a CBE could not be objectified” and the paper’s Conclusion states, “By providing reliable information and a proper preparation of the students for the exam via an introduction to the software, a CBE is a good method to conduct written examinations efficiently and fairly.” Neither conclusion is totally supported by their data due to the limitations the authors have recognized.

4. Whether the test examination was specially written to adapt to both a CBE and a PBE as compared to the “usual genetics exam” that would be given otherwise should be specified.

**Minor Essential Revisions**

1. In Abstract Results, “Reasons for the students' objections against CBE include additional noise from the keyboard or missing habits normally present in a paper based exam.” This statement denotes the least frequent of the objections and
gives a skewed perspective of the PBE group objections.

2. In Abstracts, I think that the group preference for PBE should be included.

3. In Abstracts, the statement, “Both groups did not differ concerning sex, computer-experience, their expected and achieved examination results of the test, and their satisfaction with the chosen format” is not totally correct. Certainly the expected test scores differed, and perhaps, their satisfaction as well.

4. Table 1 should show all 19 items questioned.

5. In Results, I don’t know what “..., both groups had the same level of previous experience with CBE (CBP: 3.7; PBE: 3.5; not statistically significant),” means. What do the numbers denote?

6. In Results, the statement “In the event of a repeat exam, the overwhelming number of the students who took CBE would choose the CBE again (2.8), only a few students (ca. 15%) stated a preference for PBE in future exams.” is not clear to me. What does 2.8 represent? Give the data alluded to.

7. In the Discussion, it is stated, “In this respect, experiences in the performed examination certainly contradict the fact that the CBE was finished earlier than the PBE. This observation coheres with the findings of another study [7], which was also able to demonstrate a smaller amount of time necessary to complete computer-based examinations.” These statements aren’t clear; data should be provided to clarify the points being made.

8. In the Discussion, where it is stated, “…there was a tendency of more students to fail the examination in the PBE-group (8 vs. 2 in the CBE-group)”, the percentages, 12.9% vs. 5.6%, respectively, ought to be listed to give a more complete picture of the unequal group sizes.

Discretionary Revisions

1. In Abstract, “(CBE) ensure higher efficiency with respect to feasibility”. I don’t think feasibility is the correct word here.

2. In Abstract, would add “voluntary” to the sentence “...(2) to examine the voluntary acceptance and satisfaction with the CBE”.

3. In Abstracts Results, “Out of 98 students, 36 voluntary chose”, should read “voluntarily”.

4. In Abstract Conclusions and in the Conclusions where it is stated, “Voluntary computer-based assessment leads to equal results”, “examinations” should be substituted for “assessment” and “test scores” for “results”.

5. In the Discussion, “The main advantage of the computer-based examination is an increase in efficacy and objectivity”; rather than efficacy, I assume the authors may mean efficiency of grading the CBE, and perhaps, even taking a CBE.
an increase in objectivity, how so?

6. In Table 2, it would be best to add n = 26 of 36 for the CBE and n = 55 of 62 for the PBE group.

7. It might be helpful to specify that they are medical students in the title.

**Level of interest:** An article whose findings are important to those with closely related research interests

**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.