Review of: "Augmented Reality (AR) Technology on Student Engagement: An Experimental Research Study"

Jarosław Andrzejczak[1]

1 Technical University of Lodz

Potential competing interests: No potential competing interests to declare.

Article constructed quite logically, although literature analysis and proper State of the Art are missing.

Hypothesis formulated correctly. However, the research method chosen probably not quite right for the stated purpose. The author wants to study user engagement, which is then verified by a self-assessment of engagement. Also problematic is the very definition of "engagement," which is not openly stated and different survey participants may have understood it differently. Similarly, many of the questions on the form did not provide an opportunity for evaluation, because they contained yes-no answers instead of a Likert scale. In addition, participants were asked to rate "improvement in understanding" while the experiment was structured so that each group saw only one solution (with or without AR). Therefore, they were not given the opportunity to rate the improvement in understanding. For example: "Do you think that the use of AR technology improved your understanding of the subject matter?".

In the results section, there is no indication of how the "score" is calculated (Tables 1-4).

The formatting is not the best - each table is given separately, while they should be combined and include summary data, which, for reasons that are not understood, are given in continuous text later in the article (making analysis significantly more difficult).

The article does not indicate what content was presented in the AR, and does not include an illustration showing the content presented - without this, it is difficult to assess the overall quality of the AR used (because with the poor implementation of the AR system used in the study, it is not the idea of AR itself that will make users feel uninvolved, but its implementation).

ANOVA was used to analyze the comparison of two data sets - also for an incomprehensible reason (I guess it is unnecessarily too "heavy" statistical method for this task).

Under "Step 3: Calculate the Sum of Squares (SS) for Each Group: SS is the sum of squared differences between each data point and the group's mean." there is no explanation of what "xi" is in the formula (given only in the text). The text does not overtly state the p-value (significance) score, but only states that it is higher than 0.05, which makes the results, despite a sizable statistical sample, not significant and cannot be used to draw conclusions about the hypothesis.

In summary, although the hypothesis is interesting and the test set of participants statistically correct, the research method and the way the experiment was conducted as well as the analysis seem incorrect.

With all due respect to the author, but this overly mechanical way of providing content and writing looks like it was generated by AI (I can't hide the fact that I felt while reviewing as if I myself was taking part in an experiment that tests whether a human will recognize a study done by AI :)).