

Review of: "Teaching the seasons of the year to kindergarten students using desktop virtual reality. A comparative study"

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Potential competing interests: No potential competing interests to declare.

The authors present a study about a desktop VR app that is used to teach the yearly seasons to Kindergarten kids. The app is compared to "traditional" teaching.

The paper is well-written and easy to follow. The idea is interesting and might also be relevant for practice. However, there are several issues that hinder publication. Authors need to work on those issues.

The most crucial issue I see is the reproducibility of the results. The evaluation is questionnaire-driven; however, the authors do not present the questions. Without them, it is impossible to verify the results and the claims. Especially the questions about the system characteristics (see hyp. 2) are important; e.g., I cannot imagine how to measure „ease of use“ for traditional teaching. Additionally, I am not sure if kids in this age group always know how to answer the questions. Further, I miss a description of the 10-point scale and its meaning.

In general, I see an issue in the design of the study. The authors mix the use of the dVR app with traditional teaching for different seasons. I would prefer a design in which you have two groups, one using the dVR app, and one with traditional teaching. Of course, this is difficult to change, but it should be discussed.

Further, I think there are several factors related to using the two versions that might impact the results and should be at least discussed. First, the authors claim that „the content used in the two conditions was not identical“ (page 6). Second, the question is if the evaluation shows, in general, that dVR is superior or if the design of their app has an important influence. Third, does the familiarization with the app influence the results? Fourth, does the individual approach for the app versus the group-based teaching influence the results?

Analyses of the collected data using ANCOVA assume that the dependent variables are linearly dependent on the independent variables, similar to linear regression. Is this really given? How can authors guarantee or at least justify this assumption?

Minor:

- Related work is exhaustive, but the authors should clearly summarize at the end the gap for the app, not only its

potential. Therefore, I would also expect a market analysis.

- It would be great if you also published the code of the app and the collected data.
- I feel it strange to call them „Kindergarten students“. I think „kids“ would be more common.
- Partly, the discussion looks more like a related work section. The authors should draw more clearly the relation to the results of their study.

Summary: In general, a good paper, but missing the questionnaires for data collection and, hence, it is difficult to analyze the comprehensibility of the results. Further, there are different issues in the design of the study that should be discussed in more detail.