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“Conceptualizing Astronomical Scale: Virtual Simulations on Handheld Tablet Computers Reverse Misconceptions”

What is the study about?

This study examined how using two different ways of displaying the solar system—a true-to-scale mode vs. an orrery mode—affected students’ knowledge of astronomical concepts. Solar system displays were presented in a software application on a handheld tablet computer.

In the true-to-scale mode, users navigated a simulated three-dimensional solar system environment using a tablet’s pinch-to-zoom touchscreen interface; this provided an accurate representation of sizes and distances of planetary bodies. The orrery mode, which is the more common way of displaying the solar system, exaggerated the size of planetary bodies relative to their orbits so surface features could be displayed. The study included 152 students from science classes in a high school in eastern Massachusetts.

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What did the study report?

The study authors reported that student gains in learning astronomical concepts, measured as the differences between pretest and posttest scores, were significantly larger when using the true-to-scale mode than when using an orrery mode.

How does the WWC rate this study?

This study was a randomized control trial, but additional information related to the random assignment process and study attrition is needed from the authors to determine whether this study *meets WWC evidence standards without reservations*. A more thorough review (forthcoming) will determine the rating for the study and report more fully on its results.

Citation

Schneps, M. H., Ruel, J., Sonnert, G., Dussault, M., Griffin, M., & Sadler, P. M. (2014). Conceptualizing astronomical scale: Virtual simulations on handheld tablet computers reverse misconceptions. *Computers & Education*, *70*, 269–280.

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