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How finger tracing of temperature graphs on an iPad can support primary school students' learning

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Abstract

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How Finger Tracing of Temperature Graphs on an iPad can Support Primary School Students' Learning

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The past decade has seen the increased use of information and communication technologies (ICTs) in the classroom (Johnson, Adams Becker, Estrada, & Freeman, 2014). Australian Primary schools have enthusiastically adopted tablet-based technologies (e.g. iPads) to engage students and support their learning. One of the affordances of tablet technology is the use of gestural input through finger touching and swiping. This research, based on the theoretical frameworks of cognitive load theory and embodied cognition (Paas & Sweller, 2012), investigated the impact of gestural input to support learning of temperature line graphs. Sixty-one Australian primary school children (8-11 years) studied worked examples using an iPad app specifically designed for this study. Participants were randomly allocated to a Trace condition, in which they learned about solving temperature graphs by tracing the graphs with their index finger and a Non-Trace condition, in which the same problems were provided without requiring tracing. Results confirmed the main hypothesis that the Trace condition would outperform the Non-Trace condition. Finger tracing, as a form of biologically primary knowledge, seems to support the construction of biologically secondary knowledge needed to understand temperature line graphs. This research builds on recent work by Hu, Ginns, and Bobis (2014) that found that tracing on paper-based worked examples led to higher performance than a non-tracing condition. The implications of our study and directions for future research will be presented.

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