

2015

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

Shirley Agostinho

University of Wollongong, shirleya@uow.edu.au

Sharon K. Tindall-Ford

University of Wollongong, sharontf@uow.edu.au

Paul Ginns

University of Sydney

Steven J. Howard

University of Wollongong, stevenh@uow.edu.au

Wayne Leahy

Macquarie University

See next page for additional authors

Follow this and additional works at: <https://ro.uow.edu.au/sspapers>



Part of the [Education Commons](#), and the [Social and Behavioral Sciences Commons](#)

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

Abstract

Abstract presented at the 8th Cognitive Load Theory Conference, Fort Collins, Colorado, USA, June 15th - 17th, 2015.

Keywords

temperature, graphs, ipad, can, support, primary, school, finger, students, tracing, learning

Disciplines

Education | Social and Behavioral Sciences

Publication Details

Agostinho, S., Tindall-Ford, S., Ginns, P., Howard, S., Leahy, W. & Paas, F. (2015). How finger tracing of temperature graphs on an iPad can support primary school students' learning. 8th Cognitive Load Theory Conference (p. 18).

Authors

Shirley Agostinho, Sharon K. Tindall-Ford, Paul Ginns, Steven J. Howard, Wayne Leahy, and Fred Paas

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

Shirley Agostinho^{a,b}, Sharon Tindall-Ford^b, Paul Ginns^c, Steven Howard^a, Wayne Leahy^d, Fred Paas^{a,e}

^a Early Start Research Institute, University of Wollongong, Australia

^b School of Education, Faculty of Social Sciences, University of Wollongong, Australia

^c Faculty of Education and Social Work, The University of Sydney, Australia

^d School of Education, Faculty of Human Sciences, Macquarie University, Australia

^e Institute of Psychology, Erasmus University Rotterdam, the Netherlands

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.

References

- Hu, F.-T., Ginns, P., & Bobis, J. (2015). Getting the point: Tracing worked examples enhances learning. *Learning and Instruction*
- Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 K-12 Edition*. Austin, Texas: The New Media Consortium
- Paas, F., & Sweller, J. (2012). An evolutionary upgrade of cognitive load theory: Using the human motor system and collaboration to support the learning of complex cognitive tasks. *Educational Psychology Review*, 24, 27-45.