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Personal computing device interfaces and their impact on learning in South African secondary school students

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Abstract

Education is an immensely powerful agent of development and innovation and as such, educational outcomes are given high priority in most settings. The advent of highly functional mobile personal computing (PC) devices such as tablet computers and related technologies has helped to generate great interest in and hype surrounding educational technology and its potential to improve educational outcomes, democratize knowledge and skills development and to kick-start development, particularly in socio-economically depressed environments. However, education has made use of technology from its very inception, with the written word itself being a prominent example, making PC device-based educational technology simply a newer entrant into the field, equally worthy of scrutiny along with other existing technologies. The written word plays a fundamental role in learning and is therefore a key vehicle through which to examine the impact of PC device-based educational technology on learning.

This dissertation examines the notion of the analogue (physical) and digital word and uses both existing theoretical considerations and research experiments to better understand differences which may exist between the two and the subsequent impact on learning. Existing empirical evidence and a range of theoretical contributions are used to construct a theoretical framework which argues for the uniqueness of the digital in comparison to its analogue predecessors. A research experiment was conducted with high school-age research participants using tablet PCs and printed paper to complete a reading task or a reading and note-taking task, followed by a test on the text passage read approximately one week later. Results obtained suggest real, but weak effects, with participants using paper performing better for questions which test factual recall in

the reading-only condition and better for questions testing conceptual understanding in the reading and note-taking condition. These findings support the view that the digital word is not necessarily equivalent to its analogue predecessors and point towards further research in this area. It is concluded that further research is required in order to better understand the mechanisms which underpin the digital word and that its primary strength lies in its ability to expand the usefulness of the written word in conjunction with the more traditional analogue word.

Key words: educational technology, reading, handwriting, the digital word, tablet PCs e-learning.