AN EVALUATION OF THE IMPACT OF 1:1 LAPTOPS ON STUDENT ATTAINMENT IN SENIOR HIGH SCHOOL SCIENCES

Simon Crook[a], Manjula D. Sharma[a], Rachel Wilson[b]

Presenting Author: Rachel Wilson (rachel.wilson@sydney.edu.au)
Corresponding Author: Simon Crook (simon@simoncrook.com)
[a]School of Physics, University of Sydney, Camperdown NSW 2006, Australia
[b]Faculty of Education & Social Work, University of Sydney, Camperdown NSW 2006, Australia

ABSTRACT

Billions of dollars are being spent across the world on providing schools and students with various technologies, such as 1:1 laptops. However, there is very little research of the impact of such implementations on student attainment, using in-depth, quantitative analyses of large sample sizes and standardized high-stakes examination scores, particularly in the sciences. Our study capitalized on a unique natural experiment rather than a researcher- designed, randomized experiment whereby, thanks to the Australian Government's Digital Education Revolution, half of grade 9 students in 2008 received laptops and half did not. Consequently in late 2011, when these students sat for their grade 12 external examinations based on the same curriculum implemented across the state of New South Wales, half of them had been schooled with 1:1 laptops for over three years, and half without. With school principals and district administrators asking the question "what will these laptops do to our examination results?" this dichotomous scenario presented us with a unique opportunity to find out. The aim of this study was to evaluate if having 1:1 laptops was a predictor of success in the sciences in the external examinations. The science students (N=967) from 12 high schools in Sydney, Australia were studied. Using socio-demographic, school and examination data, multiple regression analyses were performed to measure the impact of the 1:1 laptop provision and other variables on student attainment in biology, chemistry and physics. We found that being schooled with 1:1 laptops had statistically significant, positive correlation coefficients with student attainment, with a medium effect size in physics (0.38), and small effect sizes in biology (0.26) and chemistry (0.23). Upon further investigation, exploring data provided by student and teacher questionnaires, we found that the greater effect size in physics corresponded with greater use of simulations and spreadsheets by students and teachers.

REFERENCES

Crook, S. J., Sharma, M. D., Wilson, R., & Muller, D. A. (2013). Seeing eye-to-eye on ICT: Science student and teacher perceptions of laptop use across 14 Australian schools. *Australasian Journal of Educational Technology. 29*(1), 82-95.

Crook, S. J. & Sharma, M. D. (2013). Bloom-ing Heck! The Activities of Australian Science Teachers and Students Two Years into a 1:1 Laptop Program Across 14 High Schools. *International Journal of Innovation in Science and Mathematics Education, 21*(1), 54-69.

Crook, S. J., Sharma, M. D., & Wilson, R. (in review). An Evaluation of the Impact of 1:1 Laptops on Student Attainment in Senior High School Sciences. *Journal of Research in Science Teaching*