

Pre-service teachers' reflections on their participation in 1:1 laptop programs

Rebecca Maria Walker

Curtin University
Australia

Susan Ellen Blackley

Curtin University
Australia

A number of government and non-government schools have implemented a one-laptop-per-student (1:1) policy. Whilst there was initial interest in the implementation of these programs, little has been done to track the uptake of digital learning technologies afforded by access to the laptops. This study examined tertiary students' reflections on their experiences with 1:1 laptop programs after graduating from secondary school and at the commencement of their Bachelor of Education course. It is an extension of a previous study conducted by the researchers (authors, 2015) that presented findings about teachers' use of laptops in 1:1 laptop program schools. The objectives of this second-phase research were to:

- Capture recollections of the students' experience of 1:1 laptop programs
- Categorise these recollections into positive and negative experiences
- Investigate the impact of 1:1 laptop programs on students' perceptions of teaching with ICTs and their personal learning at University.

Keywords: ICTs, laptops, pre-service teachers

Background

One-to-one laptop initiatives in schools have been expanding significantly over the last decade. This is due to a number of factors: less expensive hardware, improved Internet connectivity, and promotion by governments and education authorities. Inspired by the Digital Education Revolution Policy document released in 2007 (Rudd, Smith, & Conroy, 2007) many secondary schools throughout Australia opted to participate in the revolution with the intention of equipping every student in Years 9 to 12 access to "world class information and communications technology" (p.1). Some schools made the decision to implement a 1:1 laptop policy throughout the year levels 8 – 12, and many independent schools placed the onus on the provision of these laptops squarely on the shoulders of the parents, mandating that students bring these for every class.

There is a body of research around the uptake by *teachers* of digital technologies in secondary schools (e.g., Handal, Campbell, Cavanagh, Petocz, & Kelly, 2013; Hsu, Wu, & Hwang, 2007; Kopcha, 2012; Mumtaz, 2006; Sang, Valcke, Van Braak, & Tondeur, 2009), and a growing body of research specifically designed to investigate the use of laptops (e.g., Inan & Lowther, 2010; Penuel, 2006; Rosen & Beck-Hill, 2012; Weston & Bain, 2010). The use of laptops by students at the direction of teachers has mostly involved note taking, assessment writing, homework, organisation, drill practices, communication and searching the internet (Authors, 2015; Keengwe, Schnellert, & Mills, 2012; Penuel, 2006). Whilst research has been conducted on *teacher* uptake of 1:1 laptop programs and, to a lesser degree, some measure of student outcomes whilst at secondary school, little investigation has been conducted in regards to an examination of the *ongoing* impact of the school experience on students entering pre-service teacher higher education. This is a key consideration as teacher beliefs based on past experiences is reported as a major challenge to technology effective integration (Mouza, 2008). The research presented in this paper contributes to the body of research as it focused upon the experiences of 1:1 laptop programs in secondary education from a *student perspective* in their first post-secondary school year of education. It was envisaged that the data collected would be flavoured by the participants' involvement in pre-service teacher education programs; perhaps influencing the reflective lens of each participant as they being to develop their professional identity.

Research method

The research undertaken was a qualitative approach within the parameters of a case study of first-

year Bachelor of Education students. The research questions were:

1. What was the nature of laptop use of students in 1:1 laptop program schools?
2. How has the 1:1 laptop program impacted students' learning at University?
3. How has the 1:1 laptop program impacted students' perceptions of teaching with ICTs?

Participants

First year Bachelor of Education students in a common first year unit (undertaken by primary, early childhood education, and secondary students) were invited to participate in the anonymous, online survey, and also a series of semi-structured focus group interviews. Due to the nature of the research, only students who had undergone a minimum of one year in a 1:1 laptop program in their secondary schooling were eligible to participate. The data set presented in this paper was sourced from two iterations of surveys and interviews: 2014 (N = 20) and 2015 (N = 10): 27 female students and three male students.

Data collection methods

Data were collected using two methods: an anonymous, online survey and semi-structured focus group interviews. The Qualtrics survey of 50 statements used two 5-point Likert scale arrangements from *Very often* to *Never* and *Strongly disagree* to *Strongly agree* to obtain students' reflections, and five semi-structured focus group interviews that were 45 – 60 minutes in length; audio-recorded; transcribed verbatim; and cross-checked by the researchers. To ensure consistency, the same researcher conducted the interviews.

The anonymous, online survey comprised both demographic and reflective components. The demographics targeted aged, gender, and number of years since leaving secondary schooling. The reflective components used the stem "At my secondary school, I used my laptop to ..." and were aligned to four different categories: *productivity activities*, *education-specific activities*, *communication activities*, and *creation activities*. These categories and statements were similar to those used by Handal et al. (2013) in their study, and were adapted to reflect the capabilities of the Apple Mac environment within a context of a 1:1 laptop program.

Data analyses

Data analyses were conducted on the survey responses and interview transcripts. The survey responses were grouped in two positive responses (*strongly agree* and *agree*; *very often* and *often*), a mid-way response (*sometimes* or *neutral*), and two negative responses (*strongly disagree* and *disagree*; *seldom* and *never*). The data were analysed in single-fields and a selection of multiple-fields (cross-tabulations) in order to gain insights into trends and relationships. The interview recordings were transcribed by one researcher, and cross-checked by the other researcher. Both researchers coded the transcripts, and then collaborated to reach consensus on the final coding. The transcripts were then analysed independently, and further collaboration resulted in a consensus.

Findings

Productivity activities usage

The productivity activities that participants rated as using most often were *word processing* and *creation of presentations using PowerPoint*: both scoring 90% "very often + often". Interestingly 100% of the interviewees confided that although the laptop was "handy for typing up assignments" there was a prevailing practice of doubling up of work: "We would still handwrite our work and then transfer it onto the laptop in Word" (Participant 2d1). The use of PowerPoint presentations was predictable: "We did a lot of PowerPoints at school for assignments" (Participant 2d2). The two lowest rated productivity activities were *draw diagrams* (scoring 60% *seldom* or *never*: "Trying to draw diagrams on the laptop was too hard so you'd always need your file with paper." Participant 2d2) and *create desktop publications* (scoring 80% *seldom* or *never*).

Education-specific activities

The highest rated activity in this category was *gain information from websites* scoring 90% *very often* or *often*.

(Participant 2d2) Actually the only thing we really used it for in class was research on the Internet.

(Participant 2a2) It was useful to be able to do searches on the Internet anytime.

(Participant 2c1) We would use it a lot for research. For example in Art, we would start a new topic,

like the Renaissance, and the teacher would tell us to research it.

Two other reasonably high-scoring activities were do my homework (80% very often or often) and investigate simulations, access videos & movies and complete assessment tasks (both at 60% very often or often).

Communication activities

The two highest-scoring activities for communication were *access the school intranet* (90% very often or often) and *access emails* (80% very often or often).

Creation activities

The three creation activities listed in the survey (Create videos/movies; create animations; create pod/vodcasts) scored highly negative: respectively, 53% *seldom or never*, 63% *seldom or never*, and 73% *seldom or never*.

Participant reflections on the school 1:1 laptop program

This group of statements used the stem “The 1:1 laptop program at my secondary school...” and Table 1 summarises the participants’ responses.

Table 1: Summary of participant reflections on the personal impact of the 1:1 laptop program

Statement	Scoring
advanced my productivity ICT skills	80% strongly agree or agree
advanced my creativity ICT skills	70% strongly agree or agree
made it easier for me to achieve to the best of my ability	60% strongly agree or agree
assisted me to be organised	60% strongly agree or agree
advanced my communication ICT skills	60% strongly agree or agree
is something I would recommend to other schools	60% strongly agree or agree
provided me with a platform to take responsibility for my learning & supported my preferred learning style	50% strongly agree or agree
motivated me to engage with my classes	40% agree (no strongly agree)
allowed me to choose the time and place for engagement with the curriculum	60% neutral

Cross-tabulation: number of years attended a 1-1 laptop school + something I would recommend to other schools

Interestingly the results of this cross-tabulation indicate that the longer the participants were involved in their school 1:1 laptop program, the less likely they would be to recommend the program to another school (0 – 1 year involvement scored 30% agreement; whilst 4+ - 5 years involvement scored 30% *neutral or disagree*).

Discussion

Three key issues were identified from the interview data: school policy versus teachers’ beliefs, student misuse of the technology, and teacher *and* student preference for pen-and-paper use. The following quotes provide an indication of why these were issues.

1. School policy versus teachers’ beliefs

2d2: [the teachers] would tell us we wouldn’t be using it in their lessons but we still have to bring them to class because they said it was school policy.

2d1: we would have the laptop open and pens and paper out. We would have the laptop at the top of the desk open because we wouldn’t be using it, but we had to have it open, so that would be the best place to get it out of the way so we could write.

2. Student misuse of the technology

2c2: There wasn’t any block on the Internet so we would be on Facebook and MySpace all the time. We didn’t do much work that year. We would take photos of teachers and edit these and show them

around.

2c1: You weren't meant to be able to get onto Facebook and Gmail but we found a way around that. The teacher was up the front and we were watching a movie on the projector and kids would be gaming on their laptops instead of word processing notes. Someone would take turns in taking the notes and then send the others those notes.

2d1: it is also really easy to have your finger on the escape key and get out of something you shouldn't be in when the teacher comes close ... only some teachers walked around while we were working.

3. Teacher and student preference for pen and paper

2c1: In English the teacher made us hand write everything. Most of our work was still pen and paper, I preferred that.

These conveyed sentiments from participants align with research reporting pre-service teachers' 1:1 laptop integration within their practicums involves directing students to utilize them for note-taking, assessment writing, communication, and internet searching (Mouza & Karchmer-Klein, 2013). These findings begin to demonstrate the cyclical nature of past learning experiences impacting future teaching practices. The interviewees recommended four key actions for teachers to undertake to make 1:1 laptop programs more effective: (1) laptop use needs to be monitored well; (2) they need to integrate them properly into lessons; (3) they should not block so many websites ("if you are going to give kids the technology then don't take it away because you don't trust them"); and (4) it is important that teachers know how to use the technology.

Finally, the interviewees reflected on how they would use the affordances of 1:1 laptop programs in their future teaching. These included allocating set times in the school day to use the laptops, using videos to demonstrate real life applications of concepts, prioritising handwriting over laptop use, not building the lesson around the laptop, infrequent use, and student-directed individual use. In addition, participants expressed their uncertainty on how to utilise the laptop within their teaching practices and very narrow views on how they would use it, for example Internet curation tools such as Scoop It and a discussion board.

These reflections demonstrate the necessity of more explicit attention to integrating technology within student learning experiences (Hughes, 2013). Furthermore, the importance of pre-service teachers being given opportunities to analyse and critically reflect on integrating technology into students learning experiences in a meaningful way (Mouza & Karchmer-Klein, 2013) rather than negatively past schooling experiences impacting their teaching practice (Cullen & Greene, 2011).

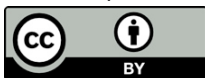
References

- Cullen, T. & Green, B. (2011). Pre-service teachers' beliefs, attitudes, and motivation about technology integration. *Journal of Educational Computing Research*, 45(1), 29-47. Retrieved from <http://jec.sagepub.com/content/45/1/29.refs?patientinform-links=yes&legid=spjec;45/1/29>
- Handal, B., Campbell, C., Cavanagh, M., Petocz, P., & Kelly, N. (2013). Technological pedagogical content knowledge of secondary mathematics teachers. *Contemporary Issues in Technology and Teacher Education*, 13(1), 22-40. Retrieved from www.citejournal.org/articles/v13i1mathematics1.pdf
- Hsu, T-S., Wu, H-K., & Hwang, F-K. (2007). Factors influencing junior high school teachers' computer-based instructional practices regarding their instructional evolution stages. *Educational Technology & Society*, 10(94), 118-130. Retrieved from www.ifets.info/journals/10_4/12.pdf
- Hughes, J. (2013). Descriptive indicators of future teachers' technology integration in the PK-12 classroom: Trends from a laptop-infused teacher education program. *Journal of Educational Computing Research*, 48(4), 491-516. Retrieved from <http://jec.sagepub.com/content/48/4/491.refs>
- Inan, F. A. & Lowther, D. L. (2010). Laptops in the K-12 classrooms: Exploring factors impacting instructional use. *Computers & Education*, 55, 937-944. Retrieved from [http://sttechnology.pbworks.com/f/Inan_\(2010\)_Laptops%20in%20the%20K-12%20classrooms.pdf](http://sttechnology.pbworks.com/f/Inan_(2010)_Laptops%20in%20the%20K-12%20classrooms.pdf)
- Keengwe, J., Schnellert, G., & Mills, C. (2012). Laptop initiative: Impact on instructional technology integration and student learning. *Education and Information Technologies*, 17(2), 137-146. Retrieved

- from http://www.researchgate.net/publication/227245942_Laptop_initiative_Impact_on_instructional_technology_integration_and_student_learning
- Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education*, 59, 1109-1121. Retrieved from <http://marianrosenberg.wiki.westga.edu/file/view/KopchaTTeachersPerceptions.pdf>
- Mouza, C. (2008). Learning with laptops: Implementation and outcomes in an urban, under-privileged school. *Journal of Research on Technology in Education*, 40(4), 447-472. Retrieved from <http://files.eric.ed.gov/fulltext/EJ826086.pdf>
- Mouza, C. & Karchmer-Klein, R. (2013). Promoting and assessing pre-service teachers' technological, pedagogical content knowledge (TPACK) in the context of case development. *Journal of Educational Computing Research*, 48(2), 127-152. Retrieved from <http://jec.sagepub.com/content/48/2/127.refs>
- Mumtaz, S. (2013). Factors affecting teachers' use of information and communication technology: A review of the literature. *Journal of Information technology for Teacher Education*, 9(3), 319-342, DOI: 10.1080/14759390000200096.
- Penuel, W. R. (2006). Implementation and effects of one-to-one computing initiatives: A research synthesis. *Journal of Research on technology in Education*, 38(3), 329-348. Retrieved from www.editlib.org/p/99387/
- Rosen, Y. & Beck-Hill, D. (2012). Intertwining digital content and a one-to-one laptop environment in teaching and learning: Lessons from the Time to Know Program. *Journal of Research on Technology in Education*, 44(3), 225-241. Retrieved from www.editlib.org/p/54959/
- Rudd, K., Smith, S., & Conroy, S. (2007). A Digital Revolution. Retrieved from http://www.pixel.com.au/documentation//products/netsupport/netsupport_school/labors_digital_education_revolution_campaign_launch.pdf.
- Sang, G., Valcke, M., Van Braak, J., & Tondeur, J. (2009). Factors support or prevent teachers from integrating ICT into classroom teaching: A Chinese perspective. In S.C. Kong et al. (Eds.), *Proceedings of the 17th International Conference on Computers in Education* (pp. 808-815). Hong Kong: Asia-Pacific Society for Computers in Education.
- Authors (2015). One-one laptop programs: Transformation or stagnation? *Issues in Educational Research*, 25(2), 99-117. Retrieved from <http://www.iier.org.au/iier25/XXX.html>
- Weston, M. E. & Bain, A. (2010). The end of techno-critique: The naked truth about 1-1 laptop initiatives and educational change. *The Journal of Technology, Learning, and Assessment*, 9(6), 6-25. Retrieved from <http://www.jtla.org>.

Walker, R.M. & Blackley, S.E. (2015). Pre-service teachers' reflections on their participation in 1:1 laptop programs. In T. Reiners, B.R. von Kinsky, D. Gibson, V. Chang, L. Irving, & K. Clarke (Eds.), *Globally connected, digitally enabled*. Proceedings ascilite 2015 in Perth (pp. 577-581). <https://doi.org/10.14742/apubs.2015.914>

Note: All published papers are refereed, having undergone a double-blind peer-review process.



The author(s) assign a Creative Commons by attribution licence enabling others to distribute, remix, tweak, and build upon their work, even commercially, as long as credit is given to the author(s) for the original creation.