Understanding parent perceptions of a 1:1 laptop program in Western Australia

Abstract
This paper provides some initial findings from a current longitudinal study that examines the implementation of a student-owned 1:1 laptop program in a school for boys in Perth, Western Australia. This research tracks 196 students, their families and associated teachers for a 3-year period (2010-2012). Underpinning this research is a mixed methods approach investigating how boys use their laptops for learning, teachers’ pedagogy and use of ICT, implementation differences between a junior and middle school, and possible impact of the laptops on learning. One theme that emerged from the first two years of data collection was a decrease in parent satisfaction with the extent to which the educational objectives of the laptop initiative were being met. This paper explores possible reasons for this decline in satisfaction, focusing on parent and student perceptions of (a) the time spent on laptops and (b) the activities that students are seen to be engaging with on their laptops. These perceptions are discussed in the context of parents’ own knowledge of, and skills in, information and communications technologies (ICT) and relate to both school and home-based settings.

INTRODUCTION

Laptop programs have had a relatively long incubation period beginning some 23 years ago in schools in the United States and Australia (Johnstone, 2003). However, with the reduction of unit costs of mobile devices, 1:1 programs are rapidly expanding in schools across the world. Empirical research into the effectiveness of 1:1 laptop initiatives is both timely and potentially valuable to those who are considering how to best harness 1:1 devices. In this paper, the 1:1 laptop program is characterised by a school-supported and student-owned laptop per student. Whilst some laptop programs provide school-owned laptops on a rotational basis, this paper deals with student-owned laptops. It is proposed that the potential for learning might be greater when students use the same machine at school and at home, as this enables greater familiarity and the ability for students to customise the device to their needs. Research suggests that incorporating laptops within an educational program can open up new avenues of teaching, potentially broadening students’ learning experiences (Weston & Bain, 2010). However, there are also legitimate concerns over the effectiveness of 1:1 laptop environments which in many cases are grounded in a generational struggle over what constitutes effective educational use (Lei & Zhao, 2008). Laptop education can be powerful, however, the success of the implementation depends upon the circumstances of individual schools and the implementation model and framework adopted by the teachers and the school (O’Donovan, 2009).

Empirical evidence available about the educational benefits of 1:1 laptop programs has continued to grow in recent years (Penuel, 2006). The implementation of laptop programs in Canada, the United States and Australia report the following results: attainment of 21st century skills, improved writing, increase in the quantity and quality of work, increase in student motivation, improved attendance, increased teacher motivation, positive changes in teaching and learning environments, increased parental and community involvement, and improved home-school communication (Alberta Education, 2006). Not all outcomes are positive though. For example, Alberta also reports that there has been a lack of appropriate professional development, technical support, sustainability, vision, leadership, planning and evaluation. These findings indicate that successful 1:1 laptop programs require careful planning and extensive consultation with school communities. This paper explores parent and student perceptions of a 1:1 laptop program, focusing on their experiences of the early implementation in junior and middle school contexts. Baseline, first and second year data are used to explore parent and student perceptions focusing on two constructs: the time students spend on their laptops and how their laptops are used.

Background
This study follows two cohorts of students, associated teachers and parents in a school for boys in Perth, Western Australia. These cohorts are a Year Five (junior school) group that progresses through to Year Seven over a three-year period, and a Year Seven (middle school) group which progresses through to Year Nine over the same period. For the purposes of this paper, the Year Five group is referred to as Cohort A and the Year Seven group is referred to as Cohort B. The School thus adopted a staged approach, embarking on a new journey, which involved a shift in paradigm, focussing on connecting education at the School with today’s digital world, supported by ICT. Traditionally the School provided an ICT experience for students with access to computer laboratories on a rotational basis, as is the norm in many schools in Australia. Prior to the implementation, staff were required to schedule the use of these resources knowing that other staff would be doing the same. Issues regarding access were another aspect of the arrangements, as the growing demand for ICT was outweighed with what could be provided for each student. With the introduction of the 1:1 program many of these issues were resolved. However, a range of other issues surfaced with increased access and ownership of individual devices. Some of these issues relate to how classroom dynamics have changed due to the introduction of the program; however, an important area of inquiry is the way in which laptops affect family life. The impact of parent involvement on educational outcomes is well documented (Valentine, Marsh, & Pattie, 2005) and therefore understanding and dealing with parent uncertainties and anxieties (Shepherd, Arnold, & Gibbs, 2006) could be critical to the overall success of the program.

Methodology
Students, teachers and parents from junior and middle school settings form the sample of this research. An adapted set of questionnaires from Newhouse (2002) were used for data collection. The questionnaires were given to all students (56 students from Cohort A and 136 students from Cohort B), teachers (60 across the School settings) and parents (196 families from the two cohorts). Completion of questionnaires at the inception (after the first month) of the study provided useful baseline data from which future comparisons could be drawn. After 9 months (the end of the first school year) and 21 months (the end of the second school year), student and parent questionnaires were again administered. Response rates for the questionnaires at inception and for the first two years are provided as Table 1.
Data collection also included interviews and observations from the first two years of the study. A smaller sample of 10 Cohort A and 20 Cohort B students was selected based upon representation from one of three categories pertaining to academic achievement: low, medium and high. Parents of the students were invited to provide feedback through focus groups.

Data from the range of sources (i.e. student and parent questionnaires, interviews, focus groups and observations) were collected to inform five research questions: (1) How do boys utilise their personal laptops? (2) How are teachers engaging laptop technology for educational purposes? (3) What educational impact, if any, do laptops have on student learning outcomes? (4) What differences can be identified between junior and middle school implementation experiences in regard to research questions 1, 2 and 3? and (5) What implications do these factors have for the future inclusion of 1:1 mobile device programs in schools?

The research is set in a pragmatic paradigm and uses a mixed methods approach in order to provide authentic and trustworthy responses to the study’s research questions. The focus of this paper is on research questions 1 and 3, specifically targeting parent and student perceptions of the 1:1 experience.

RESULTS

Perceptions of how much laptops were used

Parents are, to some degree, unaware of how laptops are used in classes for learning. However, many indicated that their sons used the laptop for a range of activities at home mostly involving social media, gaming and music. Most parents and educators believe the use of ICT to improve student engagement and learning (Selwyn & Hasen, 2010). A consistently reported message was:

I am concerned that, although boys are getting used to using a laptop and all they offer, it is at the expense of handwriting, and specifically, the speed of writing and when they eventually get to Year 12 exams. (Parent Cohort B, First Year)

Table 2 illustrates parent views of the time that their child spent on using laptops whilst at school. The proportion of parents from Cohort B who perceived that their child was using the laptop too much almost tripled between inception and the end of the second year. This compares to the perceptions of parents from Cohort A, who actually recorded a decrease of 3.2% over the same period. At the end of the second year of data collection 80% of Cohort A parents believed that the laptops were being used for the correct amount of time. These sentiments compare with 55.6% of parents from Cohort B.

Table 2: Parent views of time spent using laptops at school

<table>
<thead>
<tr>
<th></th>
<th>Incidence</th>
<th>First Year</th>
<th>Second Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
<td>Cohort A</td>
<td>Cohort B</td>
<td>Cohort A</td>
</tr>
<tr>
<td></td>
<td>(n=59)</td>
<td>(n=72)</td>
<td>(n=105)</td>
</tr>
<tr>
<td></td>
<td>62.5%</td>
<td>52.9%</td>
<td>87.5%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
<td>96.4%</td>
</tr>
<tr>
<td>Student</td>
<td>Cohort A</td>
<td>Cohort B</td>
<td>Cohort A</td>
</tr>
<tr>
<td></td>
<td>(n=35)</td>
<td>(n=6)</td>
<td>(n=45)</td>
</tr>
<tr>
<td></td>
<td>62.9%</td>
<td>91.7%</td>
<td>92.3%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 3: Student views on time spent using laptops at school

In the first year of the study 14.9% of Cohort B students indicated that they used their laptop for less than 30 minutes. It should be noted that in the first year the School decided to have a laptop free day each Friday purely for logistical reasons to minimise the flow on effects of storage and safety due to the curriculum requiring each student to participate in interschool sport. This was altered in the second year and Cohort B students were able to use their laptops each Friday. Subsequently only 3.1% of all Cohort B students indicated that they used their laptop for less than 30 minutes in the second year of the study. In most cases for both cohorts, there was a higher concentration of students using their laptop between 1 and 3 hours. 66.2% of Cohort A students and 67.6% of Cohort B students were in this range in the second year of the study.

Perceptions of how laptops were used

Parents who perceived that their son spent too much time on the computer were often critical of the types of activities that their child was engaging in. For example:

My son is obsessed with using his computer purely for non learning activities, Facebook, games, and communication. He always hides behind his laptop. He must learn or do some work but instead plays and communicates hours on end if he could. (Parent Cohort B, Inception)

The lack of handwriting skills was a common sentiment:

I am concerned that my son’s ability to handwrite has slowed down to a detrimental level. He found himself unable to complete his NAPLAN English writing assessment. It concerns me that he may not be practising handwriting enough. Whilst exams are still to be hand written the boys need to practice this skill as well. (Parent Cohort A, First Year)
Gaming in particular was an ever-present concern across the two cohorts:

Need to make sure boys have no access to gaming. They are clever, not just in particular, their friends are clever too or big brothers. They seek ways of getting onto gaming sites where parents do not know if it is a gaming site. (Parent Cohort A, Second Year).

I feel that there is too much distraction created by the laptops in class. I am continually told by my son about boys playing games, and mucking around on their laptops instead of listening and working. (Parent Cohort B, Second Year)

This concern is consistent with research from Kerawalla & Crook (2002) who found that computer gaming took priority over students writing, drawing and completion of homework.

Parents were also aware that the laptops were used to research and present information but were concerned about the depth of research. For example:

Students should spend less time worrying about the appearance as opposed to the content. Teach kids how to research ethically and move away from cutting and pasting large volumes to complete set tasks. (Parent Cohort A, First Year)

Since the introduction of the laptop program, teaching and learning dynamics in the classroom have changed. Teachers need to deal with issues that arise from an increased temptation for students to be off-task. Interviews and classroom observations that took place in the first two years indicated that there was an element of off-task behaviour that was not only being noticed by parents, but also by students:

I think the laptop program is great and I think it enhances our learning each day. At times we do take short cuts and it creates stoppiness in our work when we want to play games and do things like Facebook instead of doing my homework. (Student Cohort B, Second Year)

Parent feedback also focused on the disconnect with the digital medium:

I see far less of what he is doing in respect to homework and assignments. Much of the work is supposedly done at school. It is more difficult to monitor his progress with homework and progress on assignments. (Parent Cohort B, First Year)

This view may indicate that some parents feel a sense of detachment or alienation with their son in using the laptop including the extent to which it impinges on their home life. This is consistent with the results of a recent study of 400 Australian parents (Green, Brady, Olafsson, Hartley, & Lumby, 2011) which found that 55% of parents felt that they needed to do more in relation to their child's Internet use.

At the conclusion of the second year of the study, parents and students were asked to rate the level of change they had seen or experienced through the laptop program. For students, a Likert scale of low to high for both cohorts was used to rate the level of change in learning since the laptop implementation. Parents were provided with a slightly different scale which included three categories: negative impact, no impact and positive impact. Results are shown in Table 4 for the students and Table 5 for parents.

<table>
<thead>
<tr>
<th>Level of change</th>
<th>Cohort A (n=52)</th>
<th>Cohort B (n=111)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Low</td>
<td>1.9%</td>
<td>2.7%</td>
</tr>
<tr>
<td>2</td>
<td>0.0%</td>
<td>2.7%</td>
</tr>
<tr>
<td>3</td>
<td>28.8%</td>
<td>24.3%</td>
</tr>
<tr>
<td>4</td>
<td>38.5%</td>
<td>55.0%</td>
</tr>
<tr>
<td>5 - High</td>
<td>30.8%</td>
<td>15.3%</td>
</tr>
</tbody>
</table>

Table 4: Student views on the level of change in learning since the laptop implementation

Cohort A parents perceived minimal negative impact, collectively totalling 4.4%. In contrast, 21.9% of Cohort B parents indicated a negative impact and a further 8.3% perceived no impact in the change in learning. Students from cohorts A and B indicated that there was a higher level of change in their learning than their parents did.

Some parents struggled to keep up with children in the use of ICT, for example:

I would like to see regular (maybe 1 or 2 times a year) information sessions regarding the laptops and how they are being used for lesson work – I feel that I don’t have the same ‘hands on’ knowledge about what my son is doing now that it’s all done on a laptop . . . I feel rather ‘distant’ to his learning in this regard though. (Parent Cohort B, First Year)

Discussion

Three themes have emerged from this paper. Firstly, parent perceptions of excessive and frivolous time that their children spend on the laptop were more prevalent in Cohort B than the Cohort A. If these perceptions are accurate, then this appears somewhat at odds with the proposition that children become better learners as they grow older (Maldonado-Carreno & Votruba-Drzal, 2011). The situation is clearly more complex as students move into teenage years where they become increasingly faced with dilemmas over which objectives to pursue. For example, cognitive and academic goals may compete with tendencies to seek belonging, build self-esteem and gain the respect of others (Schweinle, Turner, & Meyer, 2009). Mastery of digital technologies (particularly gaming) could be seen as a passport to popularity. Other contextual factors also come into play as students enter middle school. For the first time, they have subject-specialist teachers and are expected to move between learning spaces responding to different teaching and classroom management approaches. When this new environment is contrasted with the stability of a primary school setting which is typically characterized by strong and respectful student-teacher relationships, it is understandable that less independent students are seduced by trivial uses of ICT. The first year of middle school may be a particularly challenging time to implement a 1:1 laptop program and special support may be required. This could be a fruitful avenue for further research.

The second theme noted was the sense of detachment or alienation that some parents felt from their child’s learning as a result of the implementation of the 1:1 program, particularly prevalent in Cohort B. If parent support for their child’s learning is a critical factor in successful learning, then minimizing this sense of alienation could be built into the planning of 1:1 laptop programs. Strategies could
include screen sharing both at school and at home and also regular parent information and/or skills sessions using laptops. Ortiz, Green, & HeeJeong (2011) suggest there may be a link in the way parents view technology and the influence that has on their own son’s learning. It was noted that if the parent held a favourable perception about the laptop as a tool, then there was the possibility that their son would have a similar view. This is an intriguing area, which calls for further inquiry.

The third theme to emerge is the difference between student and parent perceptions of changes in learning since the introduction of the laptop program. Students from both cohorts perceived greater shifts in their learning than their parents. It is possible that the first two themes (parent perceptions of frivolous and excessive use of the laptops and parent detachment or alienation) may have negatively influenced their impressions of the overall learning taking place. However, more data and interpretation is required to fully understand this phenomenon, particularly in relation to the types of changes that students perceive (e.g. skill-based versus high order cognitive shifts; process versus content; formal versus informal).

**Conclusion**

1:1 laptop programs can be a doubled-edged sword. On the one hand, they can provide enhanced opportunities for student-centred learning where access to electronic resources along with communication and creative tools are ubiquitous. On the other hand, they can be antagonistic to the learning process seducing certain types of students to spend time on wasteful and even anti-social activities. Mature learners possessing a strong work ethic and well developed organizational skills are more likely to be self-directed and educationally responsible with 1:1 devices. If these students are provided with relevant and challenging curricula, then positive educational outcomes might be expected to emerge from a 1:1 laptop program (Weston & Bain, 2010). A successful 1:1 laptop implementation, therefore, is a partnership between educator and learner, both taking responsibility for the development and maintenance of effective educational learning spaces. Asking students and parents how much and how their laptops are used, provides some much needed insights in helping to describe the nature of this partnership.


**Authors Note**

Dr Frank Bate (Senior Lecturer)

Frank is a Senior Lecturer in the School of Education and the School of Medicine at the university of Notre Dame. His goals as an academic are to be an exemplary and innovative teacher, and to adopt rigorous empirically-based research practices that generate solid evidence and inform decision-making. He is a firm believer in establishing a nexus between research and teaching, and is particularly active in exploring the potential of educational technologies in teaching and learning in K-12 and adult learning contexts.

Associate Professor Jean MacNish

Dip Teach (Curtin), BEd Secondary (Curtin), MEd (Deakin), PhD (Curtin)

Associate Professor Jean MacNish is the ICT Co-ordinator in the School of Education at the University of Notre Dame, Fremantle. Jean’s goal is to adopt sound research practices that provide solid evidence to inform decision-making and best practice. Her particular interest and experience lies in educational technology and assessment practices. Jean believes in using sound ICT integration principles combined with up-to-date educational research to design and develop contemporary educational settings. Dr. MacNish has extensive experience in education, both as a teacher and in senior management roles. Her research and teaching interests are now focused on ICT integration in education where she seeks to generate and apply new knowledge in how to best leverage ICTs in teaching and learning.

Steven Males

Steven has worked in a range of schools across Australia and has a real interest in education and the use of ICT in K-12 environments. He is currently a primary school principal in Western Australia and is completing his PhD at the University of Notre Dame.

**References**


