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Parent and student perceptions of the initial implementation of a 1:1 laptop program in Western Australia

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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 (primary) and middle (secondary) school, and possible impact of the laptops on learning. One theme that emerged from the first year of data collection was a decrease in parent satisfaction with the extent to which the educational objectives of the laptop initiative are 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.

Keywords: 1:1, ICT, perceptions, digital divide, laptop use, parents.

1. Introduction

1:1 laptop programs began some 30 years ago in schools (Johnstone, 2003). However, as information technology has become more affordable and accessible in today's society, 1:1 laptop programs are increasingly emerging in schools across the world. 1:1 laptop programs are defined in this paper as a school-supported and student-owned laptop per student. With the potential for the same machine to be used at school as at home, a student-owned laptop enables students to become familiar with the device and customise it to their needs. Incorporating a laptop within an educational program opens up new avenues of teaching and potentially broadens students' learning experiences. 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).

Research-based evidence available about the educational benefits of 1:1 laptop teaching and learning 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, 2006). Not all outcomes are positive though. For example, Alberta (2006) 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 in Western Australia, focusing on their experiences of the early implementation in junior and middle school contexts. Baseline and one year out 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.

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2. Background

This study is based on two cohorts of students, associated teachers and parents in one school for boys in Perth, Western Australia. These cohorts are a Year 5 (primary) group that progresses through to Year 7 over a three year period; and a Year 7 (secondary) group which progresses through to Year 9 over the same period. Parents from both cohorts were invited to be a part of the pre-implementation process prior the commencement of the program. This process provided the school community with meetings and workshops prior to the commencement of the program. For its part, the school embarked on a new journey, which involved a shift in paradigm, focussing on connecting education at the School with today's technological 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 arose from these 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 but often overlooked 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.

3. Methodology

Students, teachers and parents from junior and middle school settings form the sample of this research. Teachers from both areas of the school were selected on the basis of their teaching loads across the core learning areas (e.g. Mathematics, English and Science). An adapted set of questionnaires from Newhouse (2002) were used for data collection. The questionnaires were given to all students (56 Year 5 students and 136 Year 7 students), teachers (60 across the school settings) and parents (196 families from the two year levels). Completion of questionnaires at the inception of the study provided useful baseline data from which future comparisons could be drawn. After one year, student and parent questionnaires were again administered. Response rates for the questionnaires at inception and after one year are provided as Table 1.

Table 1. Response rates for parent and student questionnaire at inception and after the first year of the study

	Inception		**After one year**	
	Year 5	Year 7	Year 5	Year 7
Parent	62.5% (n=35)	52.9% (n=72)	87.5% (n=49)	77.2% (n=105)
Student	100% (n=56)	100% (n=136)	96.4% (n=54)	83.8% (n=114)

Data collection also included interviews and observations from all three years of the study. A smaller sample of 10 Year 5 and 20 Year 7 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 and teachers who taught six or more periods a week were selected for an interview. Data from the range of sources (i.e. teacher, 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 is there 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 laptop programs in schools?

The research is set in a pragmatic paradigm and uses a mix of methods 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.

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4. Results - Initial implementation findings

4.1. 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 are keen to make good educational use of ICT to improve student engagement and learning (Selwyn & Husen, 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 Year 7a)

Initially as indicated in the results in Table 2, parents in Year 7 had an underlying concern about how much time was spent using the laptop at school. When comparing baseline data to the data collected at the end of the first year of the study, Year 7 parents indicated a 13.7% increase in their perceptions that laptops were used too much. This compares to the perceptions of parents from Year 5 who actually recorded a decrease of 2.1%.

Table 2. Parent views on time spent using laptops at school

Baseline	Year 5 *n*=35	Year 7 *n*=72	1st Comparison	Year 5 *n*=49	Year 7 *n*=105
Not enough	0%	4.2%	Not enough	0%	2.9%
Very little	0%	9.7%	Very little	4.1%	8.5%
Correct amount	85.7%	75.0%	Correct amount	83.7%	63.8%
Too much	14.3%	11.1%	Too much	12.2%	24.8%

Judgments pertaining to the amount of time students spend on learning tasks that involve ICT are subjective. What is "too much" for one parent may be "not enough" for another. However, it is interesting that parents who perceived their children as spending too much time on their laptops from both cohorts generally self-assessed themselves as having lower than average ICT knowledge and skills. Parents from the two cohorts were asked to rate their knowledge and use of computers as either novice, intermediate or experienced. An overall mean score was calculated where 1 = novice, 2 = intermediate, 3 = experienced. The overall mean for the total number of respondents was 2.2. Further to this, 72.9% of Year 5 parents and 64.1% of Year 7 parents were in the intermediate and novice range. 29.4% of the novice respondents believed their son's used their laptop too much.

4.2. 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. Always hides behind. He must learn or do some work but instead plays and communicates hours on end if he could. (Parent Year 7b)

Reliance on the use of spell checker, gaming, the amount of time students spend on enhancing the look of their work, lack of handwriting skills, listening to music, and concerns about students not spending enough time outdoors were common sentiments.

> 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 handwritten the boys need to practice this skill as well. (Parent Year 5a)

Gaming in particular was an ever-present concern across the two cohorts. This 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:

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> 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 Year 5b)

Since the introduction of the laptop program, teaching and learning dynamics in the classroom have changed. For the first time, teachers need to deal with issues that arise with the temptation for students to be off-task, these being the use of applications that are not relative to learning. Interviews that took place in the first year indicated that there was an element of off-task behaviour that was not only being noticed by parents, but also by students.

> At times it's hard to concentrate, as there are too many games, especially when the person next to you is playing Call Of Duty 4. (Student Year 7a)

Parent feedback focused on issues of effective monitoring:

> 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 Year 7c)

This may indicate that many parents feel a sense of trepidation of their son using the laptop including the extent to which it impinges on their home life. At the end of the first year of the study, parents and students were asked to rate the level of change they had seen or experienced through the laptop program. A Likert scale of low to high, for each cohort, students and parents, was used to rate the level of change. Results are shown in Table 3.

Table 3. Student and parent views on the level of change in learning since the laptop implementation (annual data)

	Year 5		Year 7	
	Student	Parent	Student	Parent
Annual	*n*=54	*n*=49	*n*=114	*n*=105
1 – Low	9.3%	2.1%	4.4%	7.8%
2	13.0%	14.6%	8.8%	16.7%
3	20.3%	31.2%	23.6%	43.2%
4	35.2%	45.8%	43.0%	23.5%
5 – High	22.2%	6.3%	20.2%	8.8%

Students from both Year 5 and Year 7 rated themselves higher than that of the corresponding parent groups. 22.2% of Year 5 students rated the change in learning high, compared to that of 6.3% by their parents. 20.2% of Year 7 students also rated the change in learning high, whereas only 8.8% of parents indicated that the change in learning had been high. Many parents struggle 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) an information session 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'm fortunate that my son is open to showing me all that he does, I feel rather 'distant' to his learning in this regard though. (Parent Year 7d)

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.

5. 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 the Year 7 cohort than the Year 5 cohort. If these perceptions are accurate, then this appears somewhat at odds with the proposition that children become better learners as they grow older. The situation is clearly more complex as students move into teenage years where they become increasingly faced with moment-by-moment 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. Mastery of digital technologies (particularly gaming) could be seen by many as a passport to popularity. Other contextual factors also come into play as students enter middle

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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 area for further research.

The second theme noted is the strong association between the lack of parent knowledge and skills in ICT and the tendency for students to be perceived as spending too much time on their laptops. If parent support for their child's learning is a critical success factor, then bridging this digital divide (Clark, Demont-Heinrich, & Webber, 2005) could be built into the planning of 1:1 laptop programs. This might include regular parent information and/or skills sessions using laptops.

The third theme to emerge through an initial analysis of the data 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. 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 learning etc).

6. Conclusion

1:1 laptop programs can be a doubled-edged sword. On 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 mobile 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. A successful 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 information in helping to describe the nature of this partnership.

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