A Study of a Secondary School Netbook Program – Strategies, Success Factors and Futures

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Abstract

This paper explores the implementation of a 1:1 Netbook Program over two consecutive years by the same cohort of students. The purpose of the study was to investigate how the Netbooks were used in the classroom and to evaluate the program after the first year of operation and the continuation of the program in the following year. The experiences of students and parents were obtained through questionnaires and teacher's reflections were obtained through interviews. The data was triangulated to determine how Netbooks were utilised in the classroom, and if there were any concerns about the use of each device. The findings are presented in a thematic style exploring the usage of Netbooks in learning and teaching, the academic value of Netbooks and the technical issues faced by students particularly in the second year of operation. In the second year of the 1:1 Program, there was a significant reduction of Netbook usage due to staff priorities and the absence of a dedicated curriculum program that required integration of the technology.

Keywords

netbooks, 1:1 programs; mobile technologies

INTRODUCTION

In 2007, the Australian Government dedicated funding to improve computer to student ratios in secondary schools. According to Rudd, Smith and Conroy (2007) "Australian students need greater access to, and more sophisticated use of, information and communications technology. They need a digital education that prepares them for the jobs of tomorrow." The purpose of the funding was to enable schools to have one computer for each student in Years 9-12 in Australia.

One approach adopted by schools was through 1:1 programs. Simply stated, a 1:1 program is where there is one device for each student. Mobile devices were embraced by schools for 1:1 programs due to their capabilities, affordability and ease of Internet connectivity and have the ability to deliver information to students whenever and wherever they want (Johnston, Adams, & Haywood, 2011; Pohio & Falloon, 2010).

There are many variants in any 1:1 program such as how the devices are used in the classroom, school expectations, leadership and planning, professional development, hardware and software specifications, infrastructure, technical support, and funding (Bebell & O'Dwyer, 2010; Shapley, Sheehan, Maloney, & Caranikas-Walker, 2010). Whilst much research has documented the advantages and successes of 1:1

programs, not all programs have been positive (Holcomb, 2009) and in some schools, programs have been terminated (Hu, 2007).

Bebell & O'Dwyer (2010) argued that teachers played a fundamental role in the effective implementation of 1:1 programs, and consequently, the onus is on them in terms of how the devices are used on a day-to-day basis. Bebell & Kay (2010) stated that it is "impossible to overstate the power of the individual teachers in the success or failure of 1:1 computing" (p. 48). This is because "students' school experiences with technology are largely dictated by their teachers" (Shapley, et al., 2010, p. 24).

This research reports on the implementation of a 1:1 program that introduced Netbooks as a core component of a Year 9 program, with a continuation of the program into Year 10. The study utilises surveys and interviews with students, parents and teachers over two consecutive years to examine the utility and value of the Netbooks in supporting teaching and learning. The study provides insights into the motivations and strategies employed by the school, the success factors of the program, and comments on the future of the program in the selected school. This contributes to the understanding of the success factors for 1:1 programs in schools and will assist teachers, school leaders and future researchers in implementing and evaluating future 1:1 programs.

RESEARCH METHOD

This study follows a previous research, which focused on the implementation of a Year 9 Netbook Program in 2011 (Keane, Lang & Pilgrim, 2012). This study compared Netbook usage by Year 9 students in 2011 and then by the same group of students in Year 10 in 2012. The aim of the research was to obtain perspectives from students, parents and teachers as well as to evaluate how the Netbook was deployed in the first year of operation and the continuation of the program in the following year.

A mixed methodology was employed comprising qualitative interview data and questionnaires to provide quantitative responses. This enabled an exploration of the effect of the Netbook on student engagement as reported by teachers, parents and the students themselves, as well as the exploration of a range of related issues, such as the value students and parents place on the role of information technology for teaching and learning as well as issues about the implementation of the new programs. Two questionnaires were administered online using Opinio. The first questionnaire was directed at students in Year 9 in 2011 and the second questionnaire was for students in Year 10 in 2012. Ethics approval was achieved for this study.

"School N" is a coeducational school in the Catholic Education system located in Melbourne, Australia. The school was selected as it implemented a 1:1 Netbook Program across its entire Year 9 level for the first time in 2011. The school continued the program in 2012 by allowing the students to use the same Netbooks when the students progressed into Year 10. In 2011, data was collected from three sources - parents, teachers and students - to get a holistic view of the 1:1 implementation. In 2012, data was collected from two sources – teachers and students in Year 10. All students from Year 9 in 2011 and Year 10 in 2012 were invited to participate in the study. Letters were sent home to parents outlining the nature of the study and seeking parental permission to participate. Students were given access to an on-line survey once permission was received. The Principal and selected teaching staff were interviewed and these were digitally recorded to allow for data validation and sharing between researchers. The interviews in this study were semi-structured (Wellington, 2000). This ensured that issues raised during the interviews could be explored (Patton 2002).

The data pool for 2011 consisted of:

- 8 interviews with teachers and members of the school leadership teams (4 female, 4 male)
- 30 completed questionnaires from students (13 female, 17 male)
- 30 completed questionnaires from parents (19 female, 11 male)

The data pool for 2012 consisted of:

- 5 interviews with teachers and members of the school leadership teams (4 female, 1 male)
- 23 completed questionnaires from students (6 female, 17 male)

The questionnaire that was given to students in 2011 included multiple scales, each comprising several statements to which participants registered levels of agreement on a 5-point Likert scale from strongly disagree (1) to strongly agree (5). The scales addressed interest and attitude towards using Netbooks and the 1:1 Program. Participants were given an option to provide further comments. In 2012, the questionnaire was shortened and required participants to agree or disagree and they were able to provide further comments. Entries to survey tick data were compiled to provide quantitative data. Free text entries and interview responses were read repeatedly to enable the coding and categorisation of responses, then counted to enable quantitative comparisons. This qualitative data analysis method was informed by the work of Boyatzis (1998), and Bogdan and Biklen (2003).

MOTIVATIONS AND STRATEGIES

In 2011, School N commenced a 1:1 Netbook Program for their Year 9 students. The School was able to fund this initiative through the Australian Government's Digital Education Revolution (DER) – National Secondary School Computer Fund, whose stated aim was to achieve a ratio of one computer to one student by the end of 2011 (DEEWR, 2008).

Historically, School N had relied on computer labs for information technology provision. Typically, the computers were kept in operation for 5 years. The DER funding was eagerly embraced for the possibilities it presented. Year 9 students were targeted because they were embarking on a new educational program in 2011 with Netbooks selected due to their size, weight and affordability. In 2010, the Principal, Assistant Principal (Teaching & Learning), E-Learning Coordinator and Network Manager met frequently to plan the implementation. The College did not formulate a master implementation strategy for other year levels but more of a wish-list, which would be reliant on available funds. Year 9 students in 2011 were able to retain the Netbooks and continued to use them in 2012 in Year 10.

In the first year of the 1:1 Program, the Year 9 teachers received significant professional development to assist with the implementation of new pedagogies into their curriculum and take full advantage of the Netbooks. The Year 9 teachers attributed the perceived success of the 1:1 Program in 2011 to the development of a cohesive team approach to the implementation, with strong year-level leadership coordinating the program. However, in the second year, the professional development offered to the Year 10 teachers was not as effective. The Year 10 teachers reported that the lack of specifically organised group meetings meant that they could not work and function as a team, unlike in the previous year, and there was no dedicated coordination across the Year 10 curriculum in support of usage of the Netbooks. Several Year 9 teachers noted that the Netbook program resulted in a greater level of collaboration and team-teaching for those teachers in the Year 9 Program (Keane, Lang, & Pilgrim, 2012). Unfortunately, this experience of collaboration and team-teaching was not present for the Year 10 teachers.

SUCCESS FACTORS
Usage of Netbooks

Figure 1 presents a comparison of the weekday usage of Netbooks by the same group of students in Year 9 in 2011 and Year 10 in 2012. It was clear that student use of Netbooks declined in the second year of the program and that the Netbooks were not being used across subjects in Year 10. One student in Year 10 commented that the Netbooks were "barely used this year and are a waste of time. They were more beneficial in Year 9." The E-learning Coordinator believed that the reduction in use of the devices from 2011 to 2012 could be attributed in part to a communication from the Principal regarding the continuation of the Netbook Program into Year 10 which indicated that, while use was encouraged, they were "not integral to the program". Interestingly, students continued to use the Netbook consistently on weekends as they had in the previous year. In 2012, 91% of the students reported that they used their Netbooks on weekends between 1-5 hours compared with 85% in 2011.
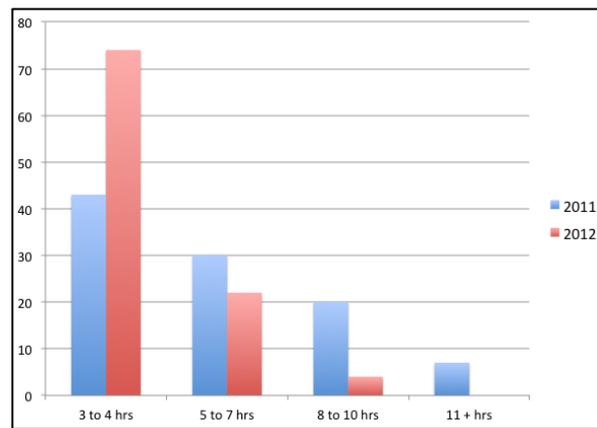

Figure 1: Weekday use of Netbooks (% respondents)

Students were asked to report their perceived usage of Netbooks in each key subject area. Figure 2 presents the percentage usage of Netbooks in subject areas in 2011 and 2012. In 2011 the Netbook was used predominately in Science, Geography, English, History, and Mathematics, whilst in 2012 the Netbooks had significant use in English, with high use in Economics, Religious Education and Technology subjects.
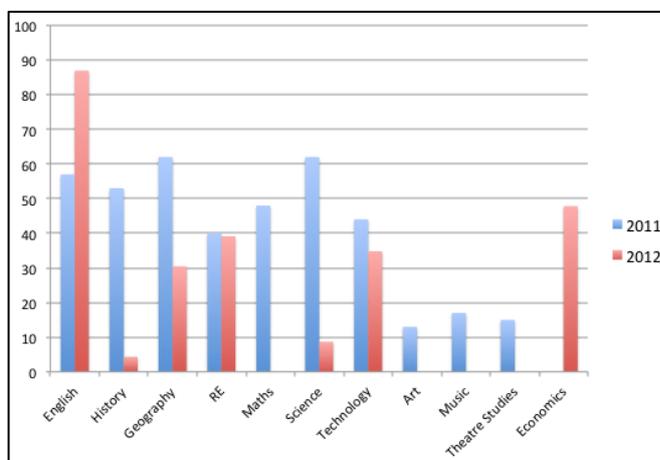

Figure 2: Use of Netbook in subject areas (% respondents)

The factors that drove these usage patterns appear to be linked to subject leadership and opportunity. In 2011, the Year 9 students reported that they used the Netbook in Mathematics for approximately 50% of the time, while in Year 10, the

subject that least used a Netbook was Mathematics. This may be attributed to subject leadership. In 2011 the Head of Maths made the decision to use an electronic textbook along with online support for Year 9. With a change in Maths leadership for 2012 there was resistance to using the Netbooks from the Year 10 Maths teachers who preferred to work with a hardcopy textbook and no online support. This decision was based on a perception that the electronic text used in Year 9 did not provide adequate preparation for Year 10, particularly in relation to the inability for students to record their working of problem solving on paper when using a Netbook. The strong influence of Maths teachers was duly noted in the Year 10 students responses from "we work from a text book and all tests are written tests to show workings out" or "because it is not at all necessary" or "there is simply no need to use a computer in a Maths class, we already have calculators and textbooks, and the format for writing is not easy to do on a computer" or finally, put simply "we use pen and paper for Maths."

The continued high usage of Netbooks in Religious Education classes was attributed to leadership and coordination, with the Head of Religious Education at School N mandating compulsory use of the Netbooks across all Year 10 classes.

In some subjects, opportunity rather than leadership appeared to be the dominant factor in Netbook usage. In English, there was no clear direction from the Faculty Head, however English teachers could decide for themselves as to their usage. Even though Netbooks were not mandated in the Religious Education subject, the usage of Netbooks in English was remarkably high in 2012. However, English teachers reported some concerns that students needed to develop and exercise different cognitive processes in writing essays using pen and paper. In Economics, the frequent use of the Netbook was due to the online textbook and online assessments and a Stock Market simulation competition that required students to have access to a computer.

Figure 3 shows the reported use of Netbooks for a range of different learning and assessment activities in 2011 and 2012.
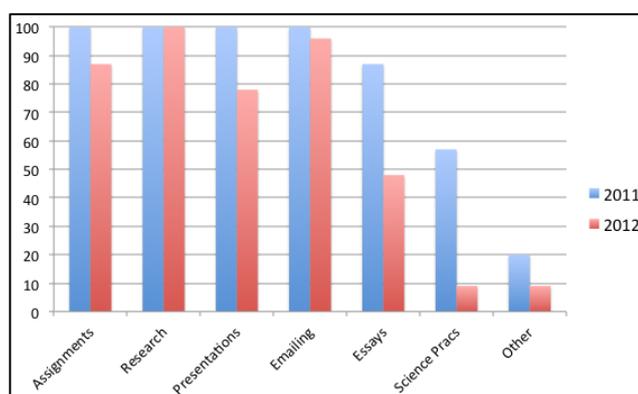

Figure 3: Use of Netbook for learning activities (% respondents)

In the first year of the 1:1 Program, students used the Netbooks predominately for assignments, researching, presentations and emailing, whereas in the second year, there were fewer presentations and assignments completed using the Netbook.

Students in Year 10 used the Netbooks for research purposes, typing notes, sending emails to their teachers, presentations and reading e-books. For the other subjects, Netbook use was restricted to emails, receiving assignment task sheets, accessing the learning management system and playing games. Many of the teachers agreed that the constant access to research materials was a significant advantage for students and this has changed how they teach.

Academic Value of Netbooks

Towards the end of the first year, the Principal made a decision to continue and expand the 1:1 Program so that students were able to keep their Netbook and take them into their next year of schooling. Towards the end of the first year of operations, when students were asked whether Netbooks were needed in Year 10, 63% thought they were. Many students in Year 9 believed the Netbooks were necessary and their learning had improved, "I think we really need the Netbooks in Year 10, they have improved our learning so much and I'm not sure how I am going to revert back into exercise books." Other students commented that, "I feel that I have grown somewhat dependent on the Netbook" or how it assisted them, "I love the Netbooks they allow me to do things that would not otherwise be possible." However not every student in Year 9 thought Netbooks were needed, "I feel as if they are a distraction to many students and are extremely cumbersome. I believe strongly that we should discontinue use of Netbooks in Years 10 and 11."

Over half of the students who responded to the Year 10 questionnaire (56%), believed that the Netbooks were important to their studies and were used for educational purposes. Students emphasised how the Netbooks facilitated their ability to conduct research. One student extensively explored the importance of the Netbook:

> It has enabled us to explore different ways of research and presentation formats. It has also allowed us to become more aware of Internet and online predators. It has also been beneficial in the way that we have some textbooks on it so they are all in the one place and at less cost to our parents and less painful for us to carry in our already loaded schoolbags. It has allowed for a quicker way to take notes. (For slow writers like me- as many teachers let you choose whether you write or type). The Netbooks are also great research tools at our fingertips, which means teachers don't have to bother booking the computer lab or laptop trolley and assignments and assessments can be easier completed at school, rather than having to do everything at home. Overall there are many reasons why I believe the Netbooks are beneficial to my classes but also my home studies.

Technical Issues

In the first year of operation, some students reported technical problems including losing information due to freezing and shutting down unexpectedly. Others believed that the small screen size impacted on their eyesight. Some students found working on small screens to be "frustrating and difficult" whilst others acknowledged the issue, they found ways to overcome the problem: "I would like to suggest bigger laptop screens as the screens do tend to hurt your eyes if you use them all day. If not, I would suggest to the students to consider connecting their Netbook to a desktop screen at home, whether it be from their home computer or a new one, as I have done."

In the second year of the life cycle of the Netbooks, the technical problems experienced by students were magnified and included: insufficient RAM, inadequate processor, slowness, computer shutting down frequently, the Netbook freezing frequently, and the battery not lasting for the whole school day.

Despite criticizing the Netbook for its technical flaws, 57% of Year 10 students thought that the Netbook was powerful enough for the subjects they studied.

FUTURES

Students were asked their opinion about the third year of operation, 61% of students didn't think that the Netbooks would see them through to Year 11 with a number of respondents expressing doubts relating to the reliability of the devices "It will be even slower and will shut down more." The unreliability of the Netbooks in the

second year of operation has cast doubts in the student's minds about their reliability.

As students approach their final years of schooling, the hand written format of the final examinations seems to affect their view of the usefulness of technology. This was seen in statements such as, "you can't use a Netbook in an exam" or "I believe that for VCE [Victorian Certificate of Education - final 2 years of study in Victoria, Australia] we should be writing everything out by hand, as all of our exams are done like that" as well as "I prefer textbooks compared to this un-powerful Netbook." Another student praised the Program, but also didn't believe they were necessary at senior levels of their schooling "these Netbooks were really good for last year, when our whole program was based around them. But for Year 10, with a lot of VCE teachers, Netbooks are not considered essential for classwork."

Although Netbooks were the devices chosen as School N's 1:1 program in 2011, the school has now made a decision to change to iPads in 2013 for students in Year 9. Those students who received a Netbook in 2011 and 2012 will continue using their Netbook. The school leadership indicated that the decision to discontinue the Netbook program was due to a number of related factors, including:

- the difference between the price of an iPad compared with a Netbook;
- parental and community perceptions that the school was keeping up with the technology due to the use of iPads in neighboring schools 1:1 programs;
- the significant increase in the range of educational applications for iPads that encourage greater usage in the classroom for teaching and learning purposes:
- the uncertainty about additional funding from the Government's DER fund beyond 2013. The costs of any future program would have to shift to parents.

Year 10 students in this study were asked about their preference for technology in the classroom and many stated, independently of the College's decision, that they would prefer an iPad, because the devices were faster, lighter in weight and could be used as a textbook. Some students preferred a laptop, due to a larger screen and better specifications. Not many students were prepared to have a Netbook: "I am perfectly happy with my Netbook, although if I had to choose a second device it would be an iPad." Only one student preferred to use a computer lab rather than be issued with a device.

6. CONCLUSION

This study reported on the implementation of a 1:1 Netbook Program over two consecutive years. An analysis of questionnaire results and interviews provided insights into the perceptions of students, parents, teachers and school leaders regarding the functionality and operational value of the Netbook in a 1:1 Program. As 1:1 Programs are unique in each school, the findings are pertinent to School N's experience.

In the second year of the 1:1 Program, it was reported that there was a significant reduction of Netbook usage. This was attributed to the fact that a specific and structured Year 10 Program, unlike Year 9, did not exist and that there was not a dedicated team of Year 10 teachers. The factors that drove the usage patterns of Netbooks, especially in the second year of operation appeared to be directly related to subject leadership and opportunity presented by the teacher. Leadership from Faculty Heads requiring compulsory use of the Netbooks across all classes of a particular subject or, in other subjects taking opportunities that presented themselves, appeared to be the prevailing factor in Netbook usage.

Students acknowledged that Netbooks were important to their studies and were useful for educational purposes. Both teachers and students agreed that the constant access to research materials was a significant advantage for students and teachers have changed how they teach. Students were particularly appreciative that the Netbooks facilitated their ability to conduct research. However, technical issues

plagued the use of Netbooks, especially in the second year of operation and this was another inhibiting factor that suppressed Netbook use in Year 10.

Even though the school purchased high-end devices at the commencement of the Program, by the second year, the specifications had been become rapidly superseded. Many students simply did not like the Netbooks. This attitude has been compounded by the deployment of intuitive tablet devices such as iPads, which have become the must have devices.

The key success factor for any 1:1 Program is how the device is used by teachers and the expectations of use by senior staff in key leadership positions in the school.

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Biographies

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