

IPADS IN A 1:1 PROGRAM: THE DILEMMA OF CHALLENGE

ACEC2014-Dr Therese Keane

ACEC2014- Swinburne University of Technology, Faculty of Science, Engineering and Technology,
Hawthorn, Australia

Abstract

This paper explores the implementation of iPads into the curriculum at Years 7 & 9 at one school. Each student in Years 7 & 9 was provided with an iPad, as part of the 1:1 Program it commenced in 2011. This study follows previous research at the same school, which focused on their inaugural launch of a 1:1 Program using Netbooks in 2011. The school continued to implement Netbooks in 2012, however in 2013, replaced the Netbooks with iPads citing cost to be a major factor in this decision. This paper will examine how iPads were used in each subject studied and whether it enhanced teaching and learning. Parental perspectives were obtained regarding the 1:1 Program and its place in their child's education. Some parents were highly critical of the provision of the devices to their children, especially with respect to time management and the questioning of necessity, whilst others praised the program. The research findings are presented in a thematic style, and provide an insight into how the iPad is used in a variety of subjects at school and at home. The paper concludes with some recommendations to inform school leaders about the challenges of implementing an iPad Initiative.

Introduction

Attempts to infuse technology into education over the past 30 years have resulted in mixed success. Schools have chosen to implement computing in the curriculum through a variety of methods, highly dependent on the type of technology available at any given time. Initially, schools initially deployed computers in special purpose rooms which quickly became computer laboratories. Later on some schools opted for highly regulated 1:1 Programs. More recently, as technology has increasingly become mobile and affordable, schools are offering variations on traditional 1:1 Programs to accommodate the changing landscape of technology usage.

Traditional 1:1 Programs were typically highly regulated with top down structures in place, incorporating specified device and model, procurement, software, warranty, insurance and a help desk on site. All students involved in traditional 1:1 Programs were expected to work within the parameters the school had outlined as part of their program. In recent years, other types of 1:1 Programs evolved to accommodate the changing landscape of both affordable technology and budgetary constraints imposed on schools. Some schools have chosen to implement BYOD (Bring Your Own Device) Programs where students bring a mobile device of their choice. BYOD Programs foster a 1:1 student to computer ratio with limited regulation and cost to the school.

In between the highly regulated 1:1 Program and the deregulated BYOD Program, other permutations and mutations of 1:1 initiatives have arisen with varying degrees of intervention, regulation and cost. Depending on the school's implementation and their interpretation of a 1:1 initiative, other considerations are taken into account such as how the technology is going to be 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 initiatives, not all programs have been positive (Holcomb, 2009) and in some schools, particularly in the United States, the programs have been terminated (Hu, 2007; Sheppard & Brown, 2011).

In Australia, the uptake of 1:1 Initiatives has been steadily increasing since Federal Government

funding was made available to improve computer to student ratios across all secondary schools. The vision of the Government's Digital Education Revolution (DER) was that "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" (Rudd, Smith, & Conroy, 2007). The funding provided by the DER meant that secondary schools have found it easier to provide computers to students.

Access to computers has been understood as one of the key barriers in the use of technology in education (Keane, 2012; Kennedy, 1991; Means, Olsen, & Singh, 1995). This has largely been addressed by schools through the provision of 1:1 initiatives. Despite the infiltration of technology in schools, both teachers and students consider the technology as a device that is additional to the paper-based operational mode of a school rather than the using the technology normally and seamlessly so that there is no emphasis on the technology itself. According to Lee (2013), this usage is described as "digital normalisation", where technology usage in the classroom is just an extension of its usage in the home and in society.

The research reported in this paper investigated the implementation of iPads in one school to determine their level of acceptance by students, teachers and parents. The next section presents a justification for the mixed methodology used as well as data analysis techniques. The findings are presented thematically and the final discussion focuses on the use of the device at both Year 7 and 9, determined from each of the stakeholder groups.

Research Method

This study follows previous research, which focused on the implementation of a Year 9 Netbook Program in 2011 (Keane, Lang, & Pilgrim, 2012) and the extension of the program into Year 10 in 2012 (Keane & Pilgrim, 2013) at the same educational institution. The previous studies compared Netbook usage by Year 9 students in 2011 and then by the same group of students in Year 10 in 2012. As the school changed the mobile device for their 1:1 Program in 2013 from Netbooks to iPads in Year 9 and added Year 7 students into the program, the study also changed focus and explored the use of iPads in Years 7 & 9. The aim of the research was to obtain perspectives from students, parents and teachers as well as to evaluate how the iPads were deployed in the third year of their 1:1 Program.

A mixed methodology was employed comprising qualitative interview data and questionnaires to provide quantitative responses. This enabled an exploration of the effect of the iPad 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 program. Three questionnaires were administered online using Opinio; two for students in Years 7 & Year 9 and one for parents of students in either or both of these year levels. Teachers including the school's Principal were interviewed to get a holistic view of the 1:1 implementation. The interviews in this study were semi-structured (Wellington, 2000). This ensured that issues raised during the interviews could be further explored (Patton, 2002). Ethics approval was achieved for this study.

The data pool consisted of:

- 4 interviews with teachers and members of the school leadership teams (1 female, 3 male)
- 33 completed questionnaires from students in Year 7 (18 female, 15 male)
- 28 completed questionnaires from students in Year 9 (7 female, 21 male)
- 47 completed questionnaires from parents (35 female, 12 male)

The questionnaire that was given to students in 2013 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 iPads and

the 1:1 Program. Participants were given an option 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).

Background of School E

In 2010, School E initiated a plan to commence a 1:1 Netbook program in 2011 for their Year 9 cohort of 210 students. The School was able to fund this initiative through the Australian Government's Digital Education Revolution (DER) – National Secondary School Computer Fund, whose purpose was to achieve a ratio of one computer to one student by the end of 2011 (DEEWR, 2008). Historically, School E had relied on the provision of computer labs to fulfil the Information Technology needs of the students. Often the computers were kept in operation for 5 years and the school did not have a strategic Information Technology goal. The DER funding was eagerly embraced to replace aging hardware as well as to provide notebooks on trolleys in various configurations.

Year 9 students were targeted because they were embarking on a new educational program in 2011 on a new external campus. The College promoted the new Program as being innovative and unique as students received a mobile device. New core subjects were specifically developed for this program *Creating Solutions* and *Mind and Body*, which specifically required the use of technology. The school was keen to adhere to the DER guidelines, of approximately \$1000 per computer. Netbooks were 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 this initiative. As there was uncertainty whether this initiative would continue through to other year levels in the future, the College did not formulate a master implementation strategy for other year levels but rather a 'wish-list', which would be reliant on available funds. In 2012, the College continued their commitment to the Year 9 Program, and provided students with a Netbook, and allowed the Year 10 students to retain their Netbook from the previous year to continue using them in 2012.

In 2013, the College retained its 1:1 Program in selected year levels, however with a change of device at Year 9. The College decided to utilise iPads in Years 9 and 7, and continued to use Netbooks in Years 10 and 11. The College believed that they were not restricted to maintaining one type of device to achieve a 1:1 Program, given the large investment in their Wi-Fi network, meaning they were agile enough to change mobile devices as they deemed necessary. 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 technological trends due to the use of iPads in neighboring schools 1:1 Programs;
- the significant increase in the range of educational applications for iPads that encouraged greater usage in the classroom for teaching and learning purposes;
- uncertainty about additional funding from the DER beyond 2013 meant the costs of any future program would have to shift to parents;
- concerns about the longevity of Netbooks in a 3 year life-cycle.

Given the school implemented a 1:1 Program as a direct result of the DER funding, the school Leadership decided that that they would continue with the 1:1 initiative, however pass the costs onto the parents. Nevertheless, serious consideration was given to keeping costs low, which in effect determined the type of device used at the school.

The iPad initiative

As part of the final installation of the DER Government funding, students in Year 9 were given their iPad at no cost to the parents, whereas students in Year 7 purchased their device. DER funding targeted students in Years 9 -12. The total cost of the device (\$500) included \$70 of “Apps”, a protective cover and some labour involved in configuring the device. For students in Year 7, costs were contained by providing the option of purchasing the previous generation of iPads. The option to purchase a current generation iPad, was available, however parents had to source the device, and pay the additional expense for the provision of *Apps*.

To support the implementation of the iPad program, teaching staff were provided with six professional development sessions. These sessions were held at the end of the previous school year, just prior to the commencement of the iPad Program. These sessions were conducted by the College’s Director of E-Learning and were attended by the vast majority of teachers who taught Year 7 and Year 9. The professional development sessions included a variety of both functional and operational demonstrations of the device as well as a walk through of the entire set of *Apps* that were preloaded on the iPads. Even though some teachers were part of the previous Netbook program and knew how to incorporate technology into their teaching and learning, they were challenged to extend their ideas on how to use these devices innovatively in their classroom.

Findings

General Use of the Device

Although the Year 9 devices were funded from the DER there were no additional restrictions or conditions imposed on them compared to those on the Year 7 devices. Similarly, the Year 9 students and the Year 7 students used their iPads at school for their scheduled classes and were encouraged to continue working on them at home. At home, most students had access to both a network and the Internet with varying degrees of restrictions imposed by parents. Year 9 students tended to use their iPads between 1- 4 hours on a school day compared to Year 7 students who used theirs on average 5-7 hours a day. Upon further examination, it was apparent that Year 7 students used their iPads in many of their subjects, unlike Year 9 students who did not use the iPad consistently. Interestingly though, Year 9 students spent on average 5-7 hours on weekends using their iPads, whereas Year 7’s used it between 1-4 hours.

Some parents expressed concern about the use of the Internet on the iPad at home and restricted their child’s usage because they wanted their children to have face-to-face interaction with other people. Parents were generally concerned that their children were electronically socialising too much and were not engaging in human-to-human interaction. One parent stated, “I feel they need to interact with the family, sharing dinners together and time to chat together as a family.” Whereas others were apprehensive that they were being “set up to fail” as the “iPad become a source of conflict, fights and arguments at home” or that they had to “police” its use.

Technical Issues

Geographically, students in Year 9 were situated on their own campus while the Year 7 students were situated on the main campus. This meant that both campuses had different levels of Information Technology support, resources and professional development opportunities.

At the commencement of the school year, there were many technical issues, which arose particularly affecting Year 9 students. A dedicated Apple server was installed for Year 7 students, but not for Year 9 students as it was envisaged that these students could connect via the VPN to the server situated on the main campus. However, this became cumbersome and unworkable as it put a strain on the Year 9 campus’ Internet bandwidth. The vendors who sold the solution did not work closely with the school’s

Information Technology Team. This ‘disconnect’ resulted in a number of largely unresolved technical issues.

Another major issue that took the College by surprise was the loss of student’s work. After much investigation the cause was found to be students sharing Apple IDs. It emerged that students were entering other students’ Apple ID’s so that they could access particular Apps and songs they did not have, and thus confusing the device resulting in loss of Apps and work. This caused several issues, including the loss of data and the inability to backup the device. Many of the students and parents commented on the loss of data and criticised the College for not having measures in place to educate their children on how to use the technology without realising that some of this was because students ignored the technology guidelines that was put in place by the College.

Use of iPads

The College stipulated that a number of *Apps* were compulsory and the iPads were preloaded with general purpose applications (*Apps*) such as Keynote, iMovie, Numbers, GarageBand, Pages, Creative Book Builder, Explain Everything, Good Reader and Elocker. However not all of these *Apps* were used extensively or consistently across many of the subjects or year levels. 21% of Year 9 students were satisfied with the preinstalled *Apps* on their iPads compared to 84% of students in Year 7. The *Apps* that were used frequently by Year 9 and Year 7 students were Pages, Keynote and iMovie. Students at both levels reported using the iPad mainly for assignments, research (internet), presentations and emailing.

Use of iPad at Year 9 in Subjects

Table 1 shows the use of the iPad as reported by students for the core subjects in Year 9. The use of the iPad in all core subjects was not as widespread as anticipated. At best, most of the core subjects would use two of the preloaded *Apps*. The most popular *App* was *Pages*, which allowed students to take notes. It was used in all the core subjects with the exception of Mathematics.

Table 1: The use of the iPad as reported by for the students for the core subjects in Year 9

	iMovie	Keynote	Numbers	Garage Band	Pages	Creative Book Builder	Explain Everything	Good Reader	Elocker
Creating Solutions					✓				
English	✓				✓				
History/Geography		✓			✓				
Mathematics			✓						
Mind & Body	✓				✓				
Religious Education		✓			✓				
Science					✓	✓			

Students were asked to report their perceived usage of iPads in each key subject area. Figure 1 presents the percentage of iPad usage in core subjects. The iPad was used predominately in History/Geography, Science and English. This could be attributed to the nature of these subjects, their ability to lend themselves to use technology in a normalised way, and the motivation and enthusiasm of the particular teachers involved in the teaching of these subjects. According to the students, 37% of

their teachers used a variety of activities in class using the iPad while only 29% let them find facts for themselves using the iPad.

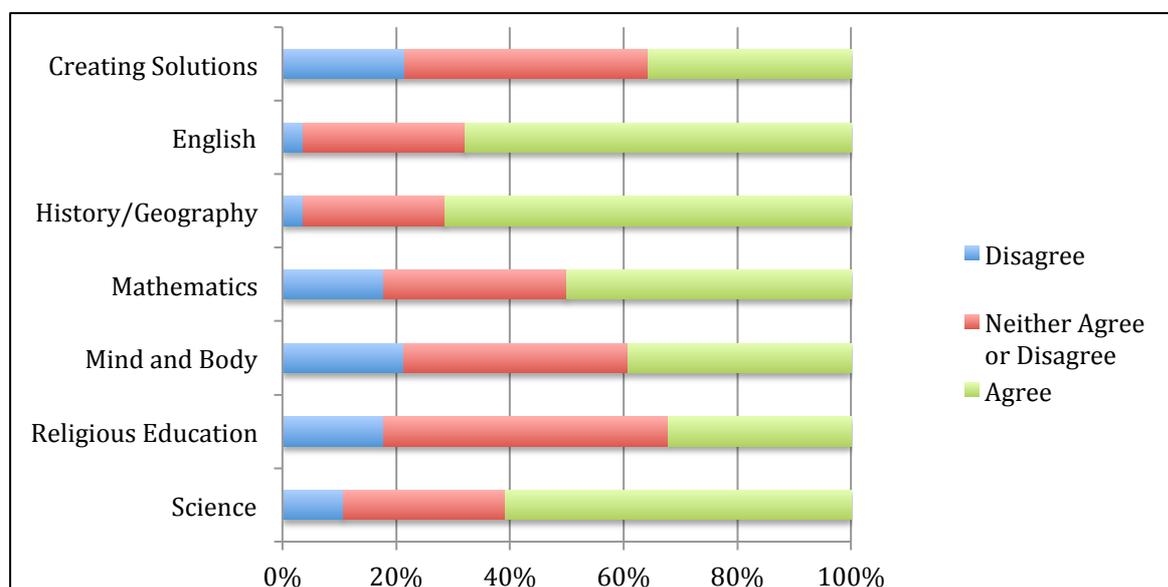


Figure 1: Indicates how beneficial Year 7 students rated the use of the iPad in each of their subjects.

Open-ended questions in the questionnaire gave the students the opportunity to elaborate on their responses. Typical responses from students included, “In English my iPad is used for assignments and sometimes note taking” another student stated that the iPad was used in Science “to look up information regarding my studies. I use Pages and Keynote in Science, plus I have my Science textbook on the iPad.” Other students noted that in History/Geography they used their iPad “as a research tool and for assignments.” The use of iPads by Year 9 students was not innovative, nor did they use their iPad for as much time as the Year 7 students on any given day. This could be attributed to the technical problems experienced by both students and teachers at the Year 9 Campus and the consequent lack of confidence in the devices, which made them seem unreliable.

Use of iPad at Year 7 in Subjects

Table 2: The use of the iPad as reported by students for the key subjects studied in Year 7.

	iMovie	Keynote	Numbers	Garage Band	Pages	Creative Book Builder	Explain Everything	Good Reader	Elocker
Drama					✓				
English		✓			✓				
Geography					✓				
German or Italian		✓			✓				
Health & Physical Ed	✓	✓			✓				
History					✓				
Indonesian		✓			✓				
Mathematics			✓		✓		✓		
Music	✓			✓	✓				
Religious Ed	✓	✓			✓				
Science					✓		✓		
Technology					✓				
Visual Art		✓			✓				

In contrast to Year 9, Year 7 students used their iPad widely in their studies. This can be attributed in part to having a reliable technical setup on the main campus of the College, and teacher accessibility to professional development and support from the Director of E-Learning. The iPad was extensively used in History, Geography, Science, English, Music, Religious Education and German/Italian. With the exception of Music, subjects that were particularly practical focused tended to use their iPad sporadically as can be seen in Figure 2. Students cited a few reasons why they did not use the iPad in practical subjects such as Drama, Health & Physical Education, Technology and Visual Art. One student commented, “we pretty much paint or do something artistic” or “we use school computers in Technology.”

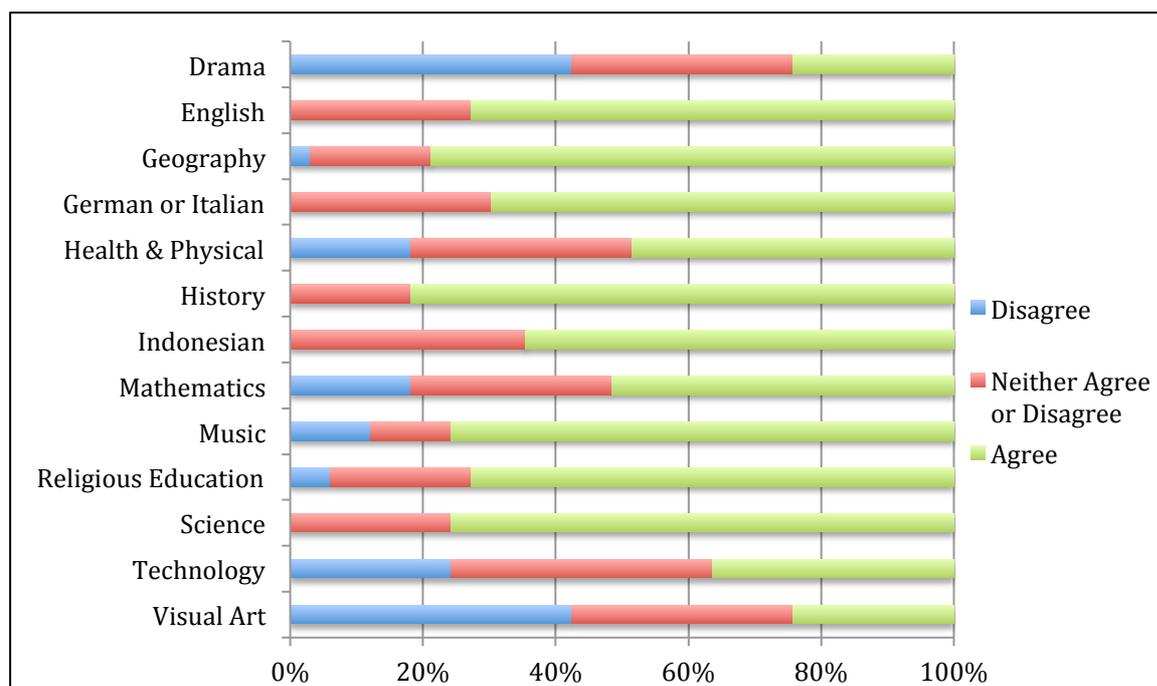


Figure 2: Indicates how beneficial Year 7 students rated the use of the iPad in each of their subjects.

According to the Year 7 students, 74% of their teachers used a variety of activities using the iPad and 85% commented that their teachers let them find facts for themselves using the iPad. Even though students in Year 7 experienced some technical issues due to identity swapping, their overall experience with the Year 7 initiative was positive with one student testifying “they are a good learning tool.”

Parental Perspective

When parents were asked about what they thought their children did in the classroom, many were at a loss to answer how the iPad was used. Others suggested that they were used as a “textbook” or for “researching”. One parent noted that their child used the iPad to “frequently take photos of what a teacher has written on the board.” Despite being able to broadly specify what students used the iPad for – many could not specifically provide examples. A few parents were concerned that the iPad was used “for entertainment rather than education” and they identified game playing and excessive socialising as major sources of concern. Whilst some acknowledged it was a beneficial tool for their children’s learning, others were unsure, “I am torn between the idea of it being the way of learning in the future versus the amount of time my child uses it for game playing at home.” Other parents were concerned about their child’s handwriting deteriorating and future eye problems due to constant screen exposure.

Conclusion

This study reported on the implementation of iPads for learning at Years 7 & 9 at one school. An analysis of the questionnaire results and interviews provided insights into the perceptions of students, parents, teachers and school leaders regarding the value of having an iPad program at Years 7 & 9. Given 1:1 Programs are unique in each school, the findings are pertinent to School E’s experiences.

Even though a 1:1 Program was in its third year at the School, the change of device was considered *new*. Many of the educators in Years 7 & 9 had prior experience in teaching with technology, and were given access to professional development to supplement their skill base. Moreover, Year 9 teachers were part of a specific and structured Program, with technology an integral component of it. Notwithstanding, only four subjects used the iPad constantly and the devices were not used as much during the school day. Whilst acknowledging some technical issues plagued the Year 9 Program, teachers were not proactive in seeking other solutions and were reconciled to using the devices as functional, rather than innovative tools.

Unlike the Year 9 Program, Year 7's experienced success. There was high student satisfaction with the 1:1 Initiative. Educators played a significant and pivotal role in the how these devices were used and deployed in the classroom. The teachers' ability to confidently incorporate the iPad into the curriculum, supported by a stable and reliable technical infrastructure ensured that the Year 7's embraced the use of the iPad.

Parental comfort with the iPads was diverse. Many of the parents could not articulate how the devices were used in their child's education. Each subject area needed to clearly communicate to parents as to how the device was being used, so that parents can have an informed opinion about them, rather than unsubstantiated comments that the devices are destructive and intrusive. It is clear that teachers and parents have yet to acknowledge the normalisation of the iPad and the device is still considered *new*.

In conclusion, the key success factors for any 1:1 Program is to ensure that:

- Parents are constantly communicated with about how the device is used to support learning & teaching
- Professional Development is constantly delivered to support teachers in learning & teaching
- Students need support and guidance on how to manage their devices
- The technical infrastructure needs to be stable and reliable.

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