EVALUATING A 1-TO-1 IPAD PROJECT: BEYOND ROSE COLOURED GLASSES

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Abstract

Today's digital world calls for contemporary pedagogical practice and curriculum that aligns with the relevance of today's youth. Educators frequently use contemporary digital tools and innovative teaching and learning approaches to engage their students. A regional single sex high school implemented a 1-to-1 iPad program for the Year 8 -10 students with the aim of creating a technology rich learning environment with personalised access which would facilitate innovative teaching and learning opportunities and to promote personal learning with additional outcomes of independence, lifelong and life-wide learning for their students.

In particular, this project investigates the use of the iPad at school and home for academic purposes and also examines the parental perceptions of the use of the device for learning. Survey data indicated that the implementation of the 1-to-1 iPad project had positive outcomes including enhanced learning opportunities and motivation for learning. However, during the initial phase of implementation, both parents and students had concerns regarding possible off–task behaviours of students when using the iPads.

Internationally education systems have invested significant financial and human resources to equip classrooms with computer technologies to enhance productivity and efficiencies, improve learning and teaching, and develop digital skills in students (Bebell & Kay, 2010). Critics of this investment commented that technologies in schools have had less than wide ranging and consistent positive impacts on learning and have been "oversold and underused" (Cuban, 2001). Since the late 1980s schools have been investing in hardware to reduce the student to computer ratio (Bebell & Kay, 2010; Fleischer, 2012). While they have achieved some success in this goal, "student-to-computer ratios have not yet reached a stage at which the technology is ubiquitous" (Bebell & Kay, 2010, p. 5). The concept of ubiquitous computing was first introduced by Weiser (1991) and he commented that "the most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it" (p. 94). Papert (1996) and others have suggested that "the full effects of computers in school cannot be fully realized until the technology is no longer a shared resource" (Bebell & Kay, 2010, p. 6). With the introduction of mobile devices and 1-to-1 projects, schools are trying to resolve the issue of having personal devices rather than shared computing resources while still considering equity of access.

1-1 Computing

As access to computing devices became more widespread, it was "possible for students and teachers in schools to transition from occasional, supplementally use of computers for instruction to more frequent, integral use of technology" (Penuel, 2006, p. 332). Many schools have implemented 1-to-1 projects which enabled 24/7 access to digital devices and the Internet (Fleischer, 2012; Penuel, 2006) at school and home making the access personal rather than shared. "Ubiquitous, 24/7 access to computers makes it possible for students to access a wider array of resources to support their learning, to communicate with peers and their teachers, to become fluent in their use of technology tools of the 21st century workplace" (Penuel, 2006, p. 332).

1-to-1 projects provide "increased access and resources when technology is no longer shared" (Bebell & Kay, 2010, p. 46) and facilitates more time on task for student learning. There are four key features

of 1-to-1 computing: Students are provided with (1) a portable device with software; (2) wireless Internet access; (3) used to complete academic tasks; and (4) the student has 24/7 access to the same device (Fleischer, 2012; Penuel, 2006).

There are a number of positive outcomes reported previously in 1-to-1 computing studies (Bebell & Kay, 2010; Fleischer, 2012; Lowther, Inan, Ross, & Strahl, 2012; Penuel, 2006; Schmidt & Ho, 2013) including:

1. Improved academic achievement;
2. Increased equity of access to digital resources;
3. Increased student-centred learning and enhanced student autonomy;
4. Increased student engagement;
5. Enhanced student motivation;
6. Higher motivation; and
7. Decreased disciplinary problems.

Teachers in Beball and Kay's (2010) study reported "widespread adoption of new and novel approaches across their traditional curriculum, which were then subsequently reported by teachers and administration to increase student motivation and engagement" (p. 16). Teachers use of technology for 'behind the scenes' increased and most teachers found they 'fundamentally changed' their teaching practices. Having said that, teachers also reported that "even after a couple of years we still fell like were just getting accustomed to teaching in a 1-to-1 setting" (Bebell & Kay, 2010, p. 21). In addition to new approaches, the access to 1-to-1 devices also increased the just-in-time teaching and enhanced the responses to teachable moments (Fleischer, 2012). Students were willing and interested to experience a 'radical shift' in their approaches to learning, however, not all teachers changed their pedagogical approach to embed the devices into the teaching and learning opportunities in their classrooms (Bebell & Kay, 2010).

Challenges for 1-to-1 Projects

Research provides little discussion about the problems associated with 1-to-1 projects (Fleischer, 2012). In their study of mass deployment of iPads, Schmidt and Ho (2013) suggested that the success of any technology integration for the improvement of learning and teaching has had a "hit-and-miss track record" and that it is "fraught with challenges"(p. 2).

When discussing mass deployment of digital devices, challenges identified by Schmidt and Ho (2013) were of a management nature and included activities such as the time involved in setting up the devices, installation, configuration, deployment of apps, making backups, and overall care and maintenance of the devices. The identification of suitable applications can be difficult given the large range available. Unlike other computing devices such as desktop and laptop computers where teachers can use monitoring software, "[t]o date, there is an inability to control activities performed on the iPad" (Henderson & Yeow, 2012, p. 81). Monitoring activity makes it possible for teachers to check what students are doing and redirect them to productive learning activities when necessary.

The limited research available reveals varied and frequent off-task behaviours with students on 1-to-1 devices during class time and finding research on off-task behaviour during homework time is even more problematic. A study completed by Donovan et al., (2010) discloses that "[s]tudent disengagement in learning, or off-task behaviour, is less researched and less documented, perhaps because the range of student off-task behaviours is extensive" (p. 426). Examples of off-task activities related to ICT use include cognitive disengagement from the current teaching and learning activities, completing non-related activities, and using the device for "purposes other than intended or specified for the learning activity" (Donovan et al., 2010, p. 426). They go on to indicate that the result of their study of 1-to-1 computing in the middle school does "not support the notion that increased access to technology leads to increased engagement in the K – 12 setting" (p. 437).

Context

This study was set in a regional Catholic community for the education of students from years 5-12. The participants of this study were students and their parents from Years 8 – 10. The school provides each child from Years 8 – 10 with an iPad as a learning tool, and the current Years 11 and 12 students were provided with a laptop. The current Year 10 cohort was part of a laptop 1-to-1 program when in Year 9. The key educational role of the iPad was to provide access to digital information and communication tools any place, anytime.

A number of apps were recommended by the school, e.g. Keynote, iMovie, Pages, PDF Expert, and Explain Everything. Students were expected to set up their own iTunes account and install the apps from the App Store at school or at home. After the first two weeks, the students were only able to download from the App Store at school before and after school.

All teachers were provided with a laptop and an iPad, and each classroom had wireless Internet, a tethered and wireless projection device, and speakers. Teachers had training for the iPad initially looking at how to use the device and then exploring the use of the iPad for learning and teaching purposes. Students and parents were involved in information sessions addressing functionality of the iPad, safety, care, consequences if iPad was misused or lost, and cybersafety.

Methodology

An online survey was made available to all Year 8 – 10 students and their parents. The purpose of the survey was to explore the perspectives of parents and students in terms of the educational use of the iPad and also to gain data for the enhancement and ongoing development of the project. The survey was conducted within the first 15 weeks of initial iPad implementation.

The student survey included 29 closed questions about the student use of the iPad and an open ended question at the end of the survey. The closed questions included items about problems with the technology, length of time using the tool, purpose for using the tool, and Apps used on the tool.

The parent survey included 10 closed questions and a section for additional parent comments. The questions included items about how their child was using the iPad and the impact it had on home and school. The comment section was widely used by the parent participants.

Results and Discussion

The self-reported results from parents and students indicated promising educational outcomes, particularly in terms of the students' use of the iPads as a learning tool and the belief of parents and students in the positive impact it had on student attitudes and motivation. This aligns with Koh et als., (2011) 1-to-1 study that found overwhelming positive reactions from students and Warschauer (2007) established that the students enjoyed the fact that 1-to-1 access allowed them to control their own learning.

In the students' response to the question: Do you use your iPad primarily as an educational tool? Only 2% of students indicated that the iPad was NOT primarily used as an educational tool; 37% answered yes; and 61% indicated mostly. One survey question asked how much of your time on the iPad at home is spent on homework, 3% of the student respondents reported that 100% of the time was for homework tasks, 41% said that 75% of their iPad time was for homework tasks, 39% said 50% of their time on the iPad was spent completing homework or assessment and 17% suggested that 25% of their time on the iPad was for homework purposes. Given this was a self-report survey, it is possible that students provided the answer they believed that their school and parents wanted to hear.

Home use of the iPad was largely to complete homework or assessment related activities. Grimes and Tawchauer (2008) research on 1-to-1 laptops also found that 75% of laptop use at home was to write and revise school assignments. Students reported that the use of the device both at school and at home was largely for educational purposes. However, from a parent perspective, 59% of parents noted

no real change in their child's study habits, 23% perceived their child had an increase in time spent on homework, 14% felt it had decreased and 4% were unsure.

The survey also indicated that because students have an iPad they have engaged in collaborative eLearning and peer teaching with students they would not normally have worked with previously. A number of students made specific comments about enhanced email access. When asked if they used their school email more having an iPad, 70% responded yes, 14% indicated no, and 16% felt they used it the same as before.

The majority of the students felt that they could achieve more with the iPad. Students also responded positively about the use of the iPad to be more organised for school with 79% of the students indicating that the iPad assisted with their organisation, 7% indicated it did not assist and 14% indicated no change to their organisation.

When asked how the students used the iPads, most of the usage was for Internet access and eBook reading, see Figure 1 below. Warschauer (2007) and Oliver and Corn (Oliver & Corn, 2008) also found high use of Internet search and increase in research skills as a result of the implementation of 1-to-1 devices.

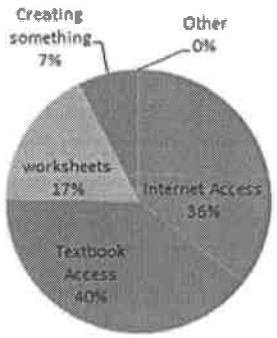

Figure 1: The major use of the iPad at school

When inquiring about which subject the students mostly used the iPad (excluding IT subjects) English had the highest level of use, closely followed by Maths. Figure 2 shows the breakdown of disciplines. Other subject areas did not have high levels of iPad usage. In contrast, Beball and Kay's (2010) study found that students were less likely to use a 1-to-1 device in Math and Science when compared to Social Science and English. They also found that "there was no single subject area or grade level where technology uses were found to be universally more widespread or universally unused" (p. 49). Although, Fleischer (2012) suggested that the use of laptops in curriculum areas varied across disciplines. He also recommended that " it would also be fruitful to investigate the connection between leisure-time based learning and academic interest" (p. 199).

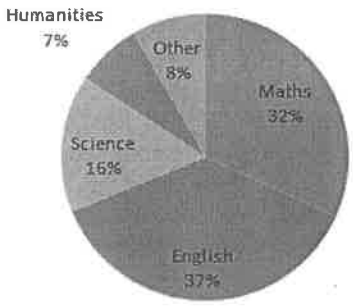

Figure 2: Use of the iPad across disciplines

Within the open ended comment section students had a very positive perception on the use of iPads for learning. This is demonstrated by comments such as: "Lets me do more at home"; and "I believe that it has helped me concentrate in class because it is something I enjoy doing (technology) and I believe I have more of an opportunity of doing stuff". Other comments indicated that the students believed that the iPads were easy to use and the portability was a significant benefit when compared to carrying around heavy text books. This aligns with Lowther, Inan, Ross and Strahl's (2012) 1-to-1 laptop study, which reported "that the use of laptops improved their learning and study skills and made them more interested in learning" (p. 25).

The majority of the parent comments were of a positive nature including the perspective that access to the iPad was responsible for increased positive attitudes towards school. It appeared that parents who set ground rules (e.g. no use at bedtime, use for social/gaming activities after homework); and those that have some IT knowledge appeared to have made more positive comments. The following is a sample of the types of positive responses made by parents: "I think having an iPad has provided more opportunity for my son to learn, especially when completing assessment and some teachers are using it for innovative learning...Overall, though I believe the positives outweigh the negatives"; "It has been a very positive impact and has made homework much more engaging"; and "There is a very noticeable improvement in his attitude towards school work and organisation of work".

Three disadvantages were presented within the student comments. Firstly, the ease with which students could get distracted by games and social activities. Illustrated by comments such as "It is a distraction in class with a very high temptation to play games"; and students "are playing too many games and are getting me distracted and I am not doing as well as I used to be". Secondly, the preference was to use handwriting or a laptop/computer to create text based items when compared to the iPad. Thirdly, they were disappointed that the school had locked the App Store during class time.

Parents, however, were concerned about the teachers directed use of the iPad with one parent commenting, "Some teachers are using the iPad extensively and some not at all". Interestingly, a number of parents were concerned about traditional reading and writing skills, preferring to purchase text books rather than use the iPad as an e-reader.

The parents' key issue centred on the non-educational use of the iPad, especially for social networking and games, which were also identified by the students as a disadvantage of the device. Many parents would have liked control over what occurs on the iPad and to remove games, Facebook, or include filtering or monitoring software. Since the initial survey, the school has found that additional parental education, in the form of tips sent out to parents, reduced this concern for parents.

There is very little research discussing the disadvantages of 1-to-1 devices and student off-task behaviours. The parent and student comments in this study align with the findings of Donovan, Green and Hartley (2010). Off-taskbehaviour during class and homework time is not a recent occurrence, students have often been distracted or disengaged in class in the past. The 1-to-1 devices provide an alternative to passing notes, staring out the window, doodling, and other non-engaged behaviours that students have demonstrated previously. Donovan et al's (2010) study suggests that student off-task behaviour "may be interpreted as being contradictory to existing beliefs on the relationship between computer access and student motivation and engagement" (p. 439).

Like the parents, Banister, Miller and Herman (2010) commented that it would be useful to have the ability to track and manage content and activity on mobile devices. In their research with pre-service teachers, Schmidt and Ho (2013) suggested that the ability to gather analytics to track device usability would assist in identifying if and when students are distracted and using the device for off-task activities. Analytic data on student usage may also enable educators to support their students in a more informed way.

83% of the parents provided rules or guidelines for the iPad use at home use. 64% felt the iPad had a positive effect on their son's education, 8% perceived a negative effect and 29% responded no real

change in their child's educational outcomes. The following quotes are representative of the parents comments: "I realise now I need to set some rules at home"; and "I would have preferred parental control mechanism or an ability to monitor what the iPad is being used for so I could better guide".

Implications

The use of mobile 1-to-1 devices enable learners to interact with content, learning resources, peers and their teachers in different ways than was traditionally available. This paper reports on a 1-to-1 project during phase one of the project implementation. When schools deliberately implement a 1-to-1 project, a number of implications need to be considered:

Firstly, the data indicated from both a student and parent viewpoint that they have positive perceptions about the use of the iPad as an educational device. This aligns with the research of Lowther et al., (2012) who also found positive attitudes and increased motivation with the use of a 1-to-1 device. Bebell and Kay (2010) also reported that the "consensus of the participants was overwhelmingly positive towards these educational opportunities afforded through increased educational technology" (p.47). These outcomes and positivity may be attributed to the training and Internet access provided by the school, affordability, light weight, immediacy of response and the low cost of applications for the device.

Secondly, this project affirmed the importance of parental involvement. Fleischer (2012) also reported on the importance of parents when implementing 1-to-1 projects. In this case there were benefits in having parental training in the use of the device, in exploring ground rules for suitable use of the device at home, and to support parents in their involvement in their son's education. Interestingly, for some families, especially where ground rules were not explored, parents felt they had less control over what the students do with the device.

Thirdly, parents and students both reported concerns about off-task behaviours or the increased opportunity for distraction, particularly in the areas of gaming or social networking. This was of concern both at home and in class. Off-task behaviours at home or in class not new however something to consider is whether the off-task behaviours of students while on iPads may have limited negative impact on the learning of other students when compared to non-iPad off-task behaviours. Henderson and Yeow's (2012) study also found "that distraction is an issue with the iPad" (p. 85) as it is with other technologies used in classrooms. The school in this study and the one in Henderson and Yeow's (2012) study indicated that it is important that "expectations are clearly laid out in terms of behaviour around the iPad and school work" (p. 85) for use at home and at school. In this study many parents recognised that at home they need to implement an acceptable behaviour or acceptable use policy.

Conclusion

This study revealed that the implementation of a 1-to-1 project resulted in a positive experience and enhanced educational opportunities. The size, portability, connectivity, and intuitive nature of the device enhanced the experience for the students. A key learning from this study is that it is necessary to set guidelines both at school and home to reduce the risk of distraction.

A limitation of this study was that the data was limited to one school in one regional centre in Australia. This limits the ability to generalise beyond the initial context. A second limitation is that the data was collected through a single self-report survey. Data collected through self-rating is subjective and may not be reliable with the participants providing the answers they believe the school would like to hear rather than the actual impact of the device. Another disadvantage is that there is no data from the teachers and it may have been useful to gain their perspective on this important matter. Future research may include some observation in classrooms to explore the range of off-task behaviours, in addition to collecting teacher perspectives.

This study indicated positive educational outcomes from the 1-to-1 iPad project. Although there are some obstacles to overcome before it reaches the potential to transform learning and teaching. The

challenge for educators is to meet the educational needs of our digital students in an environment where the tools themselves change quickly and the IT skills of students develop faster than that of the teachers. The 1-to-1 project provide students with access to a personal device for use at home and school rather than access to a shared device.

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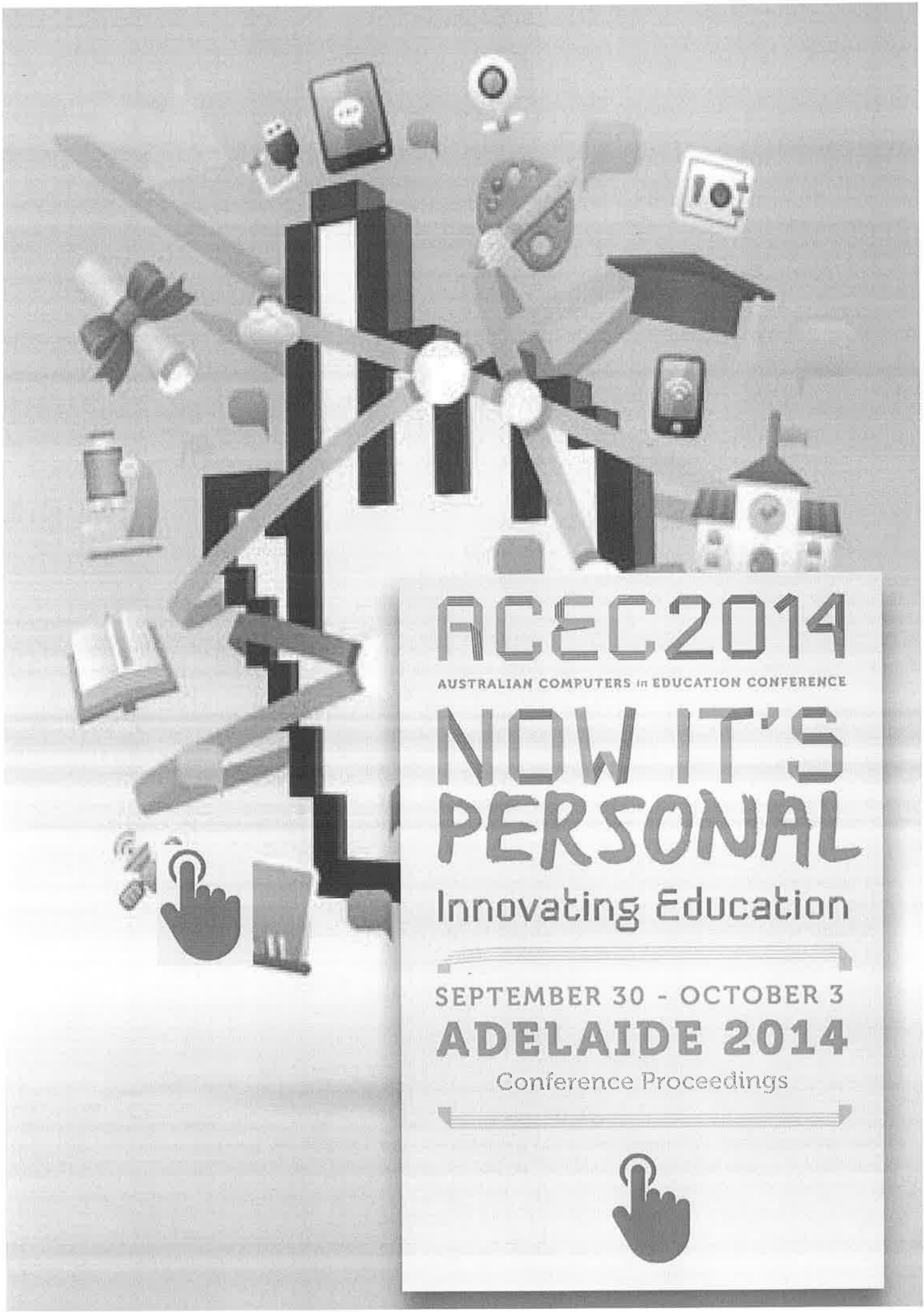

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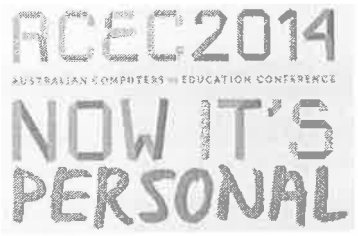

Conference Proceedings of the Australian Computers in Education Conference 2014

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Welcome to the conference proceedings for ACEC2014

The ACEC2014 Now IT's Personal conference explores the three themes of Innovative Learning, Inspiring Leadership, and Redefining Education. The conference has been organised by EdTechSA (formerly CEGSA) for, and on behalf of, Australian Council for Computers in Education (ACCE). The Conference Program Chair Dr. Trudy Sweeney together with Program Executive Sue Urban have edited the proceedings.

The first iteration of the conference proceedings is on USB and available to all delegates on the first day of the conference. After the conference the ACEC2014 website will be available as an "up-to-date" conference proceeding.

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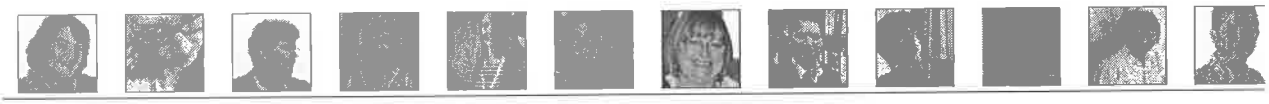

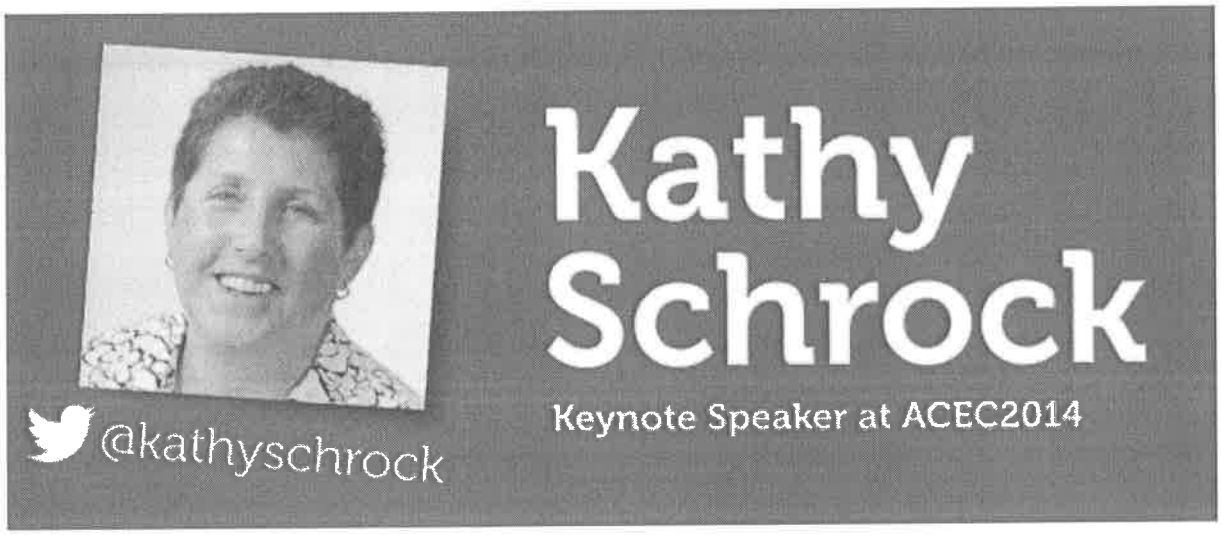

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