

Do rural and regional students in Queensland experience an ICT 'turn-off' in the early high school years?

ABSTRACT

Students learning in regional, rural and remote locations in Queensland are currently experiencing a 'turn-off' in relation to school-based ICT in the first three years of high school. At the same time, students are experiencing increasing levels of interest and motivation from their use of ICT at home. Given the importance of ICT as an enabling factor in transforming pedagogy and bridging the barriers of distance, it is essential that educators connect with learners' experiences in order to devise strategies to ensure that students have increasing levels of engagement with ICT across the curriculum rather than the diminishing levels of satisfaction that are currently evident. This paper reports preliminary findings from the large study of Year 8, 9 and 10 students and focuses on data from students in regional, rural and remote schools (n = 629), which was extracted from the full dataset of 1,292. This research employed a case study approach using surveys, interviews and focus groups with students and teachers. This paper presents both quantitative and qualitative evidence indicating that home-based ICT usage was considered more interesting and preferred compared with school-based ICT usage. Explanations for why this trend is occurring will be discussed.

INTRODUCTION

The National Council of Australian Governments' (COAG) (2009) Digital Education Revolution (DER) is investing over \$2.2 billion over six years to prepare students to enter the digital world. This considerable investment in Australian schools will provide new Information and Communication Technology (ICT) infrastructure, including connections to broadband, online curriculum resources and teacher professional development. The aim is to make ICT a central feature of curriculum delivery in schools. However, in order to capitalize on this investment, it is crucial to engage teachers and students in ICT. If students are disengaged with school-based ICT education, the risk is that the enormous DER investment will not be leveraged to its full potential.

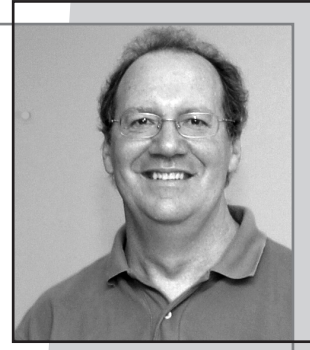
There is a crucial need to strengthen teaching effectiveness, embed the use of technology across the curriculum, and to motivate and engage students in technology rich experiences; thus ensuring that students are prepared for digital futures (Department of Education and Training [DET], 2009; Lee & Finger, 2010; Trilling, 2009). However, abundant research has shown that many students, and in particular early high school students, are disengaged, or 'switching off' to school-based learning (Anderson, 2009; Anderson, Lankshear, Timms & Courtney, 2007; Courtney, Timms & Anderson, 2006; Dinham & Rowe, 2008), while remaining increasingly engaged in home-based ICT (Finger & Sun, 2010; Lee & Finger, 2010). Young people today have grown up in homes with a proliferation of sophisticated digital technologies, which create extensive learning opportunities that foster digital competence and confidence (Lee & Levins, 2010), however, approximately two-thirds of digital technologies that students use every day (e.g., mobile phones, computer games, social computing) are banned from use in schools (Lee, 2010). Furthermore, the inconsistency of ICT access

between home and school, particularly limited Internet access in schools (e.g., network filters), is an area of student angst and frustration, often compelling young people to rely on the unfiltered Internet access at home to complete school-based work (Hay, 2010).

The average Australian home has a higher level of digital technology than the average classroom, as well as having fewer constraints on the access and use of this technology (Lee & Finger, 2010). The Australian Communications and Media Authority's (ACMA, 2008) survey found that 98% of households have a computer, 91% have internet, 84% have broadband, and 97% have mobile phones, with 82% of boys engaged in video or computer games compared to 58% of girls engaged in social computing activities (e.g., emails, chats, FaceBook, MySpace), listening to music and using mobile phones. Interactions with parents, other family members, and peers have been shown to have a significant impact on student's perceptions of their abilities and beliefs about technology, which is positively associated with engagement with ICT (Facer, Sutherland, Furlong & Furlong, 2001). Additionally, studies have found (e.g., Teo, 2008) that students with access to home computers, and who use computers frequently, were more likely to have better academic outcomes, and that the pursuit of self-determined, problem solving activities had the greatest influence on academic performance (Livaditis, et al., 2003). It has been recommended that schools adopt an instructional approach that reflects the nature of learning that young people are using at home; utilizing technological skill-sets that students have perfected and favour (Lee, 2010). Utilizing ICT



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to encourage connectivity between home-based and school-based learning, building home-school networked communities, has the potential to bridge the digital divide between home-based and school-based learning, which will contribute to better academic outcomes for students and prepare them as the digital citizen of tomorrow (Hay, 2010; Lee & Finger, 2010; Sutherland, Snyder & Angus, 2003).

Developing digital schools, networked communities and e-learning, which is aligned with DER, is indispensable for regional, rural and remote Australia. One of the aims of the DER is to provide universal access to ICT and the Internet across Australia (COAG, 2009). Universal access has the potential to bridge the barriers of distance to ensure that students in regional, rural and remote schools have access to the same learning opportunities as students in larger, and often better resourced, metropolitan schools (Atkinson, Black & Curtis, 2008; Devins, 2003).

This paper presents preliminary findings of a three year study conducted in Queensland schools. One of the aims of this research is to compare and contrast student's attitudes of and experiences with ICT in regional, rural and remote Australia with those of students in metropolitan schools. Prior to outlining the current research project, a short overview is presented of a completed research project into ICT attitudes in upper secondary school because it was the findings from that research that provided the stimulus for the current research into the early secondary school years.

Completed High School Study 2004 - 2006

With the aim to investigate the declining number of girls in ICT career pathways, the research team from James Cook University, in partnership with Technology One and Education Queensland, funded by an Australian Research Council (ARC) Linkage grant, completed an extensive investigation (2004 to 2006) of senior high school girls' (Years 11 & 12) attitudes towards ICT. Findings from more than 1400 survey responses, and extensive individual and focus group interviews, revealed negative perceptions about school-based ICT tantamount to a general mindset against ICT. The ICT 'turn off' was largely attributed to negative experiences of ICT in students' early high school years. A significant number of girls reported that ICT subjects in Years 8, 9 and 10 were too highly structured and comprised uninspiring tasks (e.g., typing, data entry), which students viewed as boring and purposeless (Anderson, 2009; Anderson, Timms, Courtney & Lankshear, 2008). This research revealed additional challenges encountered by regional, rural and remote students: Internet connections were slow; server/network breakdowns were high; technical assistance was poor; teacher expertise and competence was insufficient; computers were old and software dated, which was exacerbated by a long wait for repairs to be completed (Anderson, Timms & Courtney, 2008).

Current Middle School Study 2008 - 2010

In order to investigate the early high school years, Anderson's research team secured another ARC Linkage grant, in partnership with Technology One and ThoughtWare Australia, with support from the Centre of Science, Information and Communication Technology and Mathematics Education (SiMERR), to continue this research with a focus on investigating students in Years 8, 9 and 10. This study aims to deliver concrete, practical, strategic responses to the problem of teens 'turning off' to school-based ICT.

METHODOLOGY

The research design combined a standard mixed methodology approach (Cresswell, 2003) comprising questionnaires and individual or focus group interviews conducted in Queensland with students enrolled in Years 8, 9 and 10. Schools were purposively selected to achieve a representative sample from metropolitan, regional, rural and remote, Government and Non-government high schools. A subset of students ($n = 629$) was extracted from the main dataset of 1,296 representing students enrolled in regional, rural and remote schools, which will be the focus of this paper. The questionnaires, which contained forced response and open ended questions, were administered to students enrolled in: one regional school ($n = 357$ students), two rural schools, ($n = 136$ students), and two remote schools ($n = 136$ students). Participants were comprised of 216 Year 8 students (females, $n = 102$; males, $n = 114$); 236 Year 9 students (females, $n = 118$; males, $n = 118$), and 177 Year 10 students (females, $n = 91$; males, $n = 86$).

RESULTS

Responses from Year 8, 9 and 10 students attending regional, rural and remote schools, indicated that overall students agreed or strongly agreed (rated on a 7-point Likert scale with 'Agree' and 'Strongly Agree' collapsed into one variable) that computing subjects are boring: 77.3% in Year 8; 69% in Year 9; and 58.2% in Year 10 (see Figure 1), with no significant difference found between attitudes of girls and boys. However, when students were asked to indicate if they loved or hated computers overall, students across all years indicated that they felt positive about computers overall, 55% of students indicated that they loved computers, 28.7% hated computers and 16% of students were unsure (see Figure 2).

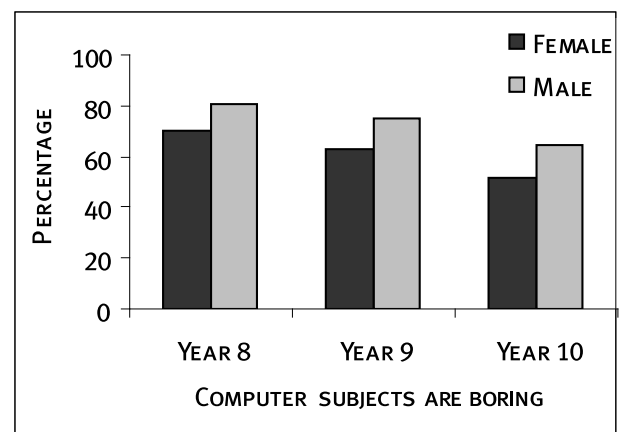


Figure 1 - Percentage of students ($n = 629$) respond

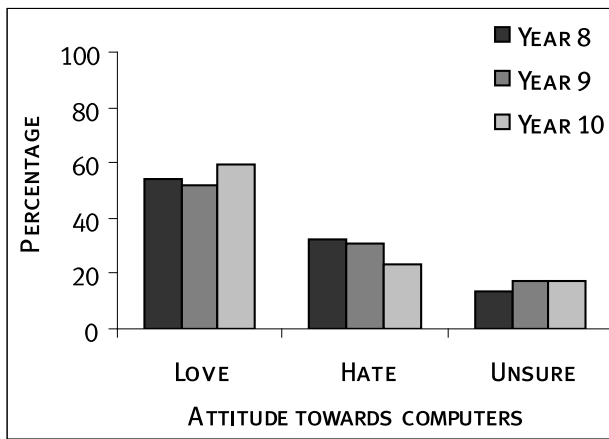


Figure 2 -Percentage of students in Years 8, 9 & 10 saying that they 'Agreed' or 'Strongly Agreed' to the 9 & 10 (n = 629) that selected how they felt about statement "Computer subjects are boring," about computers in general (Love, Hate, Unsure).

The results revealed that the 87% (n = 547) of students preferred using the computer at home: 90.1% of regional students (n = 357); 88.1% of rural students (n = 136); and 78.9% of remote students (n = 136) (see Figure 3).

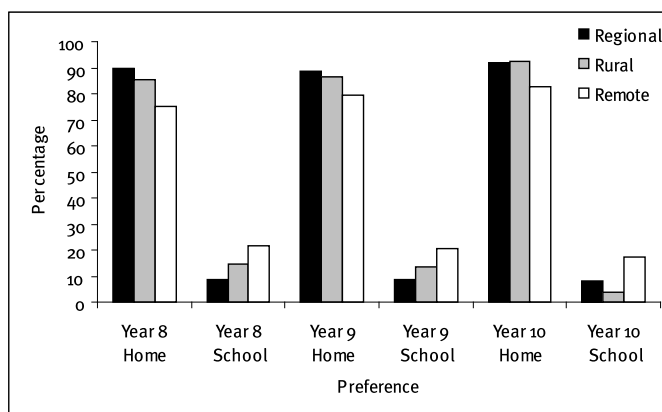


Figure 3 - Percentage Year 8, 9 and 10, regional rural and remote students' (n = 629) preference for using computers at home versus using computers at school.

The results also revealed that only 15 students (2.4%) reported that they did not have a computer at home; all from rural or remote schools. Student responses to open questions in the surveys, and also in focus group interviews, provided a range of reasons for the strong preference to use computers at home: 43% mentioned unblocked access and faster Internet at home; 36% stated the ability to engage in social networking (e.g., FaceBook, Twitter); 29% stated that they had more freedom at home to multitask (e.g., use the computer while listening to music or chatting with friends); 17% said that they had more or unlimited time at home; 16% were engaged in playing games; and 6% mentioned that their home computers were faster and/or better equipped than school computers. These reasons will be explored in the discussion.

DISCUSSION

A study by Sutherland, et al. (2003) provided early evidence that a profound disjuncture between school-based and home-based had developed, potentially leading to a different type of 'digital divide'. They concluded that "although the 'digital divide' usually refers to the gap between information-rich and information-

poor, in our research it is equally apt to describe the disjunction between information technology use at home and school. A start to bridging this digital divide must be an examination of the ways in which pedagogical connections can be made between school and home information and communication technology practices" (p.18). Seven year later, the current larger study does not indicate any improvement in this situation as it provides overwhelming evidence about a sense of boredom with school-based ICT and an almost unanimous preference for home-based computing. It is our contention that in order to forge effective pedagogical connections between the two influential sites of learning, we must first examine the source of discontent associated with school-based computing put forward by participants in this study – teachers, and most importantly, students. Factors most commonly cited by students included: lack of opportunities for multi-tasking; poorly functioning Internet blocking and filtering; uninspiring uses of ICT; computers and/or Internet connections that are slow or crippled by sharing bandwidth across the network; and lack of effective maintenance, particularly in rural and remote areas. The following sections will briefly examine each issue and provide typical illustrative responses from participants in the study.

Multitasking

Many students in the study objected to the common school restrictions on multitasking and cited this as a major reason for the home preference. Examples include:

"Definitely use computers different at home. At home you have no limits on time, or what you can do, how many things you can do almost at the same time. Like I can do homework and internet at the same time to find cool things to add to my assignment and when I am looking I find out lots of other stuff, maybe not for that assignment, but cool stuff and I read all about that and can use that maybe another time." (Year 9 Boy, remote school)

I have music open, I have about three internets open, one homework and I'd have like two Words or something. I can't work without it – every time I'm working on the computer, I have music either in the background or on the computer. (Year 8 Girl, regional school)

"Because at home I can go on Facebook/YouTube and it is more comfortable and easier to concentrate on assignments" (Year 10 Girl, remote school).

Teachers often argued against multitasking on the basis that it can be distracting or that it leads to overloads on the school network, resulting in slow access speeds for all. One student agreed that multitasking can be distracting at home:

"Sometimes because you want to do more than one thing at a time. Say if you have got homework, you open that thing first up but you don't really do it. You open it up and put about a sentence in there and get your music going and get the internet going and you just do everything else and then 'Oh.'" (Year 9 Boy, rural school)

A rural teacher, and computer coordinator with network administration responsibilities, commented:

"Where I'm coming from is the fact that the bandwidth of your music on there looks like it isn't a situation, but when you understand technically what is happening you multiply this music across the bandwidth of any internet service, times 30 or more, then your internet speed is not halved, it is down to a snail's crawl."

So that is the main reason for music not being allowed in that environment.”

Although studies support the view that multitasking is distracting, they often match a particularly distracting task with another incompatible task, such as Hembrooke and Gay (2003) who matched a formal lecture with students using internet connected laptops during the lecture and Ellis, Daniels and Jauregui (2010) looking at performing a study task while using SMS. Perhaps the problem could be alleviated by schools allowing limited multitasking with compatible tasks combined with access to faster broadband through the National Broadband Network.

Internet filtering

An overwhelming number of students cited Internet filtering as a major reason for their home preference. For example,

“Sometimes like you hit a picture on like Google and it comes up a big red blob thing. Oh, you don’t mean to do it. They still get you.” (Year 9 Boy, rural school)

“Because, although there are more programs at school, a lot of harmless sites are blocked.” (Year 8 Boy, rural school)

“You can’t hide anything here (at school). Make one wrong click on the internet and you are on his computer and he is like ‘You are on my hit list and it is like,’ Oh Gosh.” (Year 9 Girl, regional school)

“The school has restricted sites so we can’t exactly go everywhere where we need to find information.” (Year 9 Girl, rural school)

Despite advances in Internet filtering software, many students reported that the filtering blocks harmless and useful content and that it interrupts the flow of their work resulting in a reduction in productivity in comparison to home-based work. Obviously, schools have a duty of care to ensure responsible use of ICT, but it is apparent from students’ and teachers’ experiences that the filtering software is not performing at a level that is sophisticated enough to not be an impediment to the smooth flow of work.

Boring tasks

Overall, almost 70% of students surveyed perceived computer tasks as boring and subsequently, the interviews and focus groups pointed to school-based computing as contributing strongly to this negative perception. Virtually all students in the interviews and focus groups categorised their home-based computing as ‘interesting’ and school-based computing as ‘boring’. The main concerns were the perception of an over emphasis on the basic functions of a few programs, such as word-processing and spreadsheets. Additionally, many students reported covering skills in their lessons that they had already acquired.

“At school you can only do exactly what the teacher says and you don’t get to learn more than the basics about a program. Then you go home and play with it and learn heaps of cool stuff that the teacher didn’t tell you. . . . probably they didn’t

know about it. Our teachers don’t know as much about the programs as I do from just playing around.” (Year 9 Girl, remote school)

“I was just going to say, because at this year level, all we really do in computers is just work and stuff. Like writing out and doing draft sheets, so people get uninterested in it, because they think that that is pretty much all you can do on a computer. Like they don’t know what else you can do.” (Year 9 Girl, rural school)

Some students appreciated building up foundation knowledge and skills at school and then exploring it further at home.

“I would say through both actually because you do things at school that you don’t do at home. And you learn something at school and then you go play around at home, actually doing it.” (Year 10 Girl, remote school)

Maintenance and performance of ICT

As in our previous study, we found that maintenance issues were a common problem in regional areas, with an increasing negative impact on perceptions of school-based computing as we moved out further into remote areas. Comments from remote teachers included:

“I just think as far as maintenance, as far as any technical problems that arise, I think that in a school lack of technical support may prove to be disastrous for some places, because I know at my last school, there were 1500 students and it wasn’t unusual to have over a hundred or more computers not working at one time.”

“At [Regional School Name] and I know that even with a full time technical support team, there was plenty of issues that just would go untouched for weeks and weeks at a time. So they can’t just give schools computers, they have to provide the technical support.”

Many students still report instances of losing their work on the school network or glitches that impact on task completion.

“Oh and when you are like in the middle of typing and you press Save and then it just goes haywire and all your stuff is lost” (Year 10 Boy, rural school)

CONCLUSION

Our recommendations for alleviating the problems that many students perceive with school-based ICT learning include new policies that allow for limited use of multitasking where the multiple tasks are compatible, and that this is increased as Australia’s broadband capacity is strengthened and accessed by schools. Another area requiring urgent attention is the development of more sophisticated filtering software that provides the necessary protection for students without blocking harmless material or unnecessarily interrupting the flow of work. One student posed an interesting idea that the school could ramp up their education program on responsible internet use and consequently remove filtering in a staged process as students moved through the school, so that filtering was not imposed on senior students. Finally, the ongoing issue with ICT equipment maintenance needs to be addressed, particularly in rural areas where students and teachers endure long delays in return from repairs and a higher incidence of equipment not operating.

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BIOGRAPHY

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