Empowering Learners with ICT is a Battle Against Educational Fundamentalism

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Abstract

Over the past 40 years computer-based systems have developed and become infused in almost every aspect of life in Australian society transforming many things to become almost unrecognisable, except it would seem, schooling. Research has identified a range of reasons why we have hung on to, what some would view as, the ‘horse and buggy’ in schools with most of the legitimate constraints now overcome. However, over the past decade we have suffered from an epidemic of what I view as education fundamentalism, supported by sections of government, the profession and the media. There appears to be an assumption that there was a ‘golden era’ of education when teachers presented the facts to students who dutifully committed them to memory, showed this by passing exams and then became successful Australian workers. The claim seems to be made that since then student achievement has deteriorated and that this is because educators have moved away from these ‘age-old’ ways of teaching. It is not surprising that the use of digital technologies does not seem to be supported because they weren’t present in classrooms in that ‘golden era’. I believe that we need to build on what we know to be true about teaching and learning, some of it going back to over a century but we don’t need to be limited by the technology and ideologies of those times.

Introduction

In 2008 an American business leader, Dr Jim Goodnight, visiting Australia was quoted as saying that schools were stuck in the ‘horse and buggy’ era and as a result “this generation of kids is very bored with the education system, and many are dropping out” (Dearne, 2008). He went on to explain that modern societies need a “workforce that understands the technologies available to us and can truly grasp the potential that data provides, and do things quicker and better”. Of interest was the background information that he had established an experimental private school in the USA at which each student had a tablet computer.

Of course Dr Goodnight’s message is not new and has been repeated in various forms for about 30 years but the question is to what extent in Australia are we stuck with ‘horse and buggy’ schools and how near are we to replacing them (the ‘horse and buggy’ not the schools)? I don’t think I would find it very difficult to point out the predominant ‘horse and buggy’ nature of almost any school and I would start with the end product of the systems by looking at Year 12. The experience of most students in Year 12 is not much different to mine in 1974 although of course there are far more students and some have more choice of courses, some of which can be quite interesting and useful. However, back then the available technologies gave us few opportunities and if it wasn’t in the textbook or library it couldn’t be known or done, or if it wasn’t in nice round figures it couldn’t be calculated. There should be no such limitations today and yet we know from research across the nation (e.g. Baskin & Williams, 2006; Hayes, 2007; Pegg, Reading, & Williams, 2007; White, 2005) that new technologies are sparingly used at school to support the learning of these students.

Research (e.g. Pegg et al., 2007) has identified a range of reasons why we have hung on to the ‘horse and buggy’ in schools with most of the legitimate constraints now overcome. However, I believe that more recently we have suffered from an epidemic of what I view as education fundamentalism. I see this in statements from sections of government, the education profession and the media. When I analyse these statements there appears to be a presumption that somewhere back in the 1950s and 60s there was a ‘golden era’ of education where teachers presented the facts to students who dutifully
committed them to memory, showed this by passing exams and then became successful Australian workers. The claim seems to be that since then student achievement has deteriorated and that this is because educators have moved away from these ‘age-old’ ways of teaching. Often it then appears that to back this up there is a search for whatever research can be found that might seem to support this contention, even if only partially quoted, and an avoidance of all research to the contrary. Therefore it is not surprising that Information and Communications Technologies (ICT) is not recommended because computers weren’t present in classrooms in that ‘golden era’ of teaching.

Identifying Educational Fundamentalism

After watching on the television in 2008 the first of the series on Fundamentalism it struck me that my analysis of reporting on education fitted the definition describing religious fundamentalists. As the dictionaries define it fundamentalism is usually refers to a “religious movement or point of view characterized by a return to fundamental principles, by rigid adherence to those principles, and often by intolerance of other views and opposition to secularism.” (www.thefreedictionary.com). If this was applied to education then I believe education fundamentalism would refer to the return to industrial age schooling by rigid adherence to didactic pedagogical principles accompanied with intolerance to other views and opposition to any change. Alas, although not widely used, the term has already been used to describe other positions (e.g. Alvesson, 2006). However, I will stay with my use of the term that I believe is more in line with common views on the concept of ‘fundamentalism’.

Is educational fundamentalism a critical component in Australian society today? Consider the following two titles to articles in the Australian newspaper on Saturday 4th August 2007: “Cyber lessons fail to lift grades” (Ferrari, 2007); and “Education’s terminal affliction” (Donnelly, 2007). Both go on to explain that research shows that using computers doesn’t improve student achievement in literacy and numeracy, the first referring to a report from the US Institute of Education Sciences and the second referring to a German study using the PISA (Programme for International Student Assessment) data. Having read both reports I believe that both these newspaper articles did not adequately represent the findings from the two pieces of research. The US report points out that while no statistically significant achievement improvement was found in most of the classes involved, the software was used for a small amount of time and teachers had no previous experience in using the software. As a result the conclusion was that they should try again after addressing these issues. The PISA based study points out that the data collected concerning the use of ICT was incidental to the study and relied on students’ own reported use of the technology at home, not at school, and not necessarily related to school activities.

Another example with which I had some personal involvement were articles in the Australian newspaper titled, “Handing out laptops to poor children doesn't improve their school performance” (Fisman, 2008) and “Low marks for computers in schools” (Ferrari, 2008b). These appeared to be published in response to the federal government’s plans under the “Digital Education Revolution” to provide secondary students with computers. In relation to one of these articles I was phoned, unannounced, to ask what I thought of research that showed that “giving children laptops led to them doing less homework”. My response was that I was not aware of the research but that clearly whether children benefited from having laptops would depend on supervision at home and connection with activities at school. I pointed out that unsupervised access to television would probably also adversely affect homework. After the phone call I managed to track down a report (Malamud & Pop-Eleches, 2008) on the research that found that when poor children in Romania were given a laptop at home they watched less TV and did less homework. However, this was nothing to do with schooling and there was no reported connection made to schoolwork or teachers. The report did point out that this finding was moderated by whether a parent was at home supervising use of the laptop. The next day when the newspaper published the article I was not surprised to see that my input was not included. More recently a similar article was published by WAtoday, “Computers for kids ‘add up to lower scores’” (Martin, 2009). It cited American research that considered whether children had a computer at home – there was no consideration of whether use was connected with learning activities at school. I wouldn't expect children to learn much using a computer at home, unsupervised and disconnected with school activities anymore than I'd expect them to learn much from watching all the soaps on TV or playing...
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These articles to me are symptomatic of a type of reporting on education over the past few years where the reporter appears to be trying to defend an ideology. It seems that anything that does not fit that ideology is countered using selective representation of information, references to carefully selected ‘authorities’, sweeping statements, emotive terminology (e.g. ‘cyber’), an implied ‘golden age’ in the past, and creating the impression that there is a ‘them’ out there who are destroying this ideal past. I believe that unfortunately this finds a ready audience because for many in the community this represents a nostalgic recollection of their own schooling and there seems to be an attitude that ‘it was good enough for me’, or even if it was “bad enough for me” (Kohn, 2009, p. 33). However, at the same time often people indicate that they never use most of what was taught at school and they didn’t like being there (Kohn, 2009).

I find it odd that many politicians and some in the profession and media appear not to see the mismatch between a ‘back to the 50s’ teaching mantra and using ICT to support learning for the 21st Century. For example, our current national minister for education seems to be missing the point when the following two quotes are considered. On the one hand she is quoted as saying, “ICT is now indispensable in today’s teaching and learning, and this investment will be crucial for the successful implementation of the Digital Education Revolution. … To be able to compete globally, Australia needs a world class education system that connects our students, teachers and schools to the global digital economy, and helps prepare them for the future.” (Media Release, 3/6/08). Yet she is also quoted as saying, “I am a passionate believer in the benefits of the rigorous study of traditional disciplines. … I am somewhat old-fashioned” (Ferrari, 2008a). I consider the latter to be a real ‘back to the 50s’ statement at odds with the constructs of a global digital economy.

During the 1950s behaviourist theories of learning dominated and therefore it is not surprising that what I view as education fundamentalism tends to advocate practices in line with these theories which Dede (2008) sees as “outside the range” of modern curriculum and resulting in “few students engaging with complex knowledge or skills”. This would all be just a nice academic argument if it wasn’t for the fact that it affects the lives of children now and in the future, and affects the nature of our society and economy in the future. I believe that Australia, with its small but ageing population, cannot afford to produce a younger cohort (remember that in this ‘golden era’ the majority of children had only basically a primary school education by today’s standards) that is unable to deal with a global and highly technological world.

Is it true that “Cyber lessons fail to lift grades”?

The suggestion is that using ICT doesn’t ‘lift grades’ particularly for literacy and numeracy. There certainly has been some research that has found improved ‘grades’ from the use of literacy and numeracy skills based software. In one of the most comprehensive studies, West Virginia’s Basic Skills Computer Education program, the use of the ICT system was found to be more cost effective in improving student achievement than class size reduction from 35 to 20 students, increasing instructional time, and cross age tutoring programs (Mann, Shakeshaft, Becker, & Kottkamp, 1999). This counters any suggestion that using ICT can’t improve ‘grades’ in the traditional sense. However, there is of course the question of what our ‘grades’ actually measure. What I term as education fundamentalism appears to over value the retention of times tables, spelling, algebraic algorithms and such like despite the fact that the vast majority of adults in our society function well without such strengths. I am not that concerned with whether ICT will help students get better grades in these because I think that there are far more important outcomes from schooling to be sought and that appropriate use of ICT can help us better deliver those outcomes. For example, I would like all children to confidently tackle problems, collect and analyse data, draw conclusions, mount arguments, and construct representations of knowledge (e.g. Jonassen, 2006).

In itself using ICT does not enhance learning; there are no direct links between the use of ICT and changes to learning outcomes. The connections are far more complex. Learning is mediated through the learning environment and therefore studies that have tried to identify the impact of ICT on learning have found it impossible to entirely remove the effects of other elements of the learning environment.
As Salomon (1994) puts it, "it is not possible to study the impact of computer use in the absence of the other factors" nor to assume that "one factor impacts outcomes independently of the others" (p. 80). However, there is little doubt from recent research (e.g. Becker & Riel, 2000; Kulik, 2003; Lei & Zhao, 2007), Becta in the UK) that when used appropriately and for enough time ICT will improve the learning of most students. Unfortunately research in Australia indicates that in general students do not use ICT at school for long enough, nor on the most appropriate tasks, to gain the benefits (Pegg et al., 2007; Whitefield, 2004). Lei and Zhao (2007) found that achievement can increase consistently with time spent using the technology up to about three hours a day at school. So the typical time of less than one hour a week for Australian students is really not going to have much impact on their learning. This same research supports the findings of numerous other studies which show that the gains are related to the type of use of the technology with activities involving higher order thinking, problem-solving and communicating skills best supported by the technology (Bransford, Brown, & Cocking, 2000). Fortunately these are the very skills that Dr Goodnight and industry leaders value and would like schools to foster. Unfortunately these don’t appear to align with an educational ‘fundamentalist’ position that appears to value lower order thinking skills, repetition and compliance.

The decisions that teachers and school leaders make about the use of ICT and the basis for those decisions are critical to the investment in the technology providing a return. There is now enough research to identify the principles that might guide using the technology effectively to support learning. Such principles are outlined in the report How People Learn: Brain, Mind, Experience, and School (Bransford et al., 2000). Using ICT is not a new way of teaching but provides opportunities to improve the way we teach by helping to create the types of learning environments and the types of support for learning that are known to be optimal. Papert (1971) foresaw this use of the technology to expand our pedagogical strategies back in 1971 when he exhorted us to “maintain a vision of a technologically oriented educational system which is grander than the current one” (Abstract). Dede (2008) suggests the “Swiss-Army-Knife design strategy” to incorporating ICT within instruction rather than looking for the “silver bullet” (p. 58). From reviews of the existing research literature, the findings may be distilled into a framework of eleven non-mutually exclusive attributes of learning environments that may be enhanced through ICT support (Newhouse, 2002).

### Potential Spoilers

There are a number of relatively recent developments in the use of ICT in schools that may represent ‘fundamentalist’ spoilers to realising the value of ICT to learning. On the surface they appear attractive but they have a tendency to entrench a ‘fundamentalist’ view of learning. Examples include the proliferation of interactive whiteboards, the replacement of paper textbooks with electronic equivalents, and the use of learning management systems.

### Interactive Whiteboards

Over the past five years interactive whiteboards have rapidly appeared in Australian classrooms. With the total cost typically in excess of $2000 they are quite an investment if placed in every classroom in a school, which is often the aim. They are usually marketed as a means of allowing students and teachers to easily interact with range of media. However, they may be largely used by teachers to project content and make their ‘chalk and talk’ more interesting. Of course there are teachers who get students up at the board to control the software and it is easier for teachers to control than using a mouse. A study commissioned by Promethean found that student achievement was likely to increase if a teacher had 10 or more years of teaching experience, had been using the technology for two or more years, had high confidence in his or her ability to use the technology, and used it 75 to 80 percent of the time in the classroom (Marzano & Haystead, 2009). If the use of IWBs leads to a greater percentage of didactic teaching then we will have lost most of the power of ICT for learning, even if some students do better at standardised tests.

### Electronic Textbooks

A number of education systems, including the textbook driven state of Texas, are moving or considering moving away from paper-based textbooks towards electronic forms of textbooks. In most
cases the rationale is an economic one with the aim to save expenditure and reduce the number of books students have to carry. In some places, such as Norway, part of the rationale is that all students already have notebook computers so it makes sense to have their textbooks on the same device. There is also the possible rationale that what is perceived to be a ‘textbook’ could be extended with the inclusion of information in a variety of media types and links to up-to-date online information sources. However, generally the rationale is economic and it is likely that students will access similar material on screen that was previously on paper. Often as students move towards the later years of schooling textbooks are associated with content requirements for high-stakes examinations. If this connection continued we could end up with students using highly flexible and powerful ICT to read books for examinations.

Learning Management Systems

Over the past two decades there has been firstly a proliferation of Learning Management Systems such as Blackboard and Moodle, followed by a consolidation as the sophistication of features developed. All Universities, most secondary schools and many primary schools now have access to some form of such system that allows delivery of content in various media forms, and the use of facilities such as bulletin boards, wikis, drop-boxes, video-conferencing and digital portfolios. While such systems provide opportunities for a diverse range of learning activities/episodes to be supported, they are often used for the delivery of largely static content, once again like a paper-based textbook. Teachers are encouraged to embrace e-learning, as the epitome of teaching, through the use of learning management systems. However, if this translates into just actions such as putting worksheets online that students download in class and possibly printed out then once again the powerful potential of ICT for learning will have been lost.

Conclusions

With the current low cost of hardware and software there is no reason why every student can’t have access to a computer whenever they need one. But unless we are going to use the facility in a purposeful and critical manner it would still be a waste of resources. Just trying to do more of the same with new technology will not get us out of the ‘horse and buggy’ era, the computers will eventually be left in the stables to gather dust. The question is, do we want to achieve more? It would seem that some would like us only to achieve what was possible 40 years ago.

It is time to put the buggy in the museum and harness the new technology to support our children in achieving more than they have ever been able to in the past. We need to build on what we know to be true about teaching and learning, some of it going back to over a century but we don’t need to be limited by the technology and ideologies of those times. Not every piece of new technology will be suitable but much of it we can adapt to replace the ‘horse and buggy’. However, the technology needs to be used well in schools to demonstrate its value and then needs to be carefully explained to the community through whatever channels we have at our disposal. I believe that this is a time of tremendous opportunity to improve dramatically the experience of school for most children but that this opportunity may be lost as a result of misinformation and misguidance. It is up to us to do what we can to provide appropriate information and guidance for the better of our children and society.

References

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