



## **Sabbatical Study**

The impact ICT has on student learning and the various ways schools are able to sustain the financial costs associated with this.

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## **Purpose**

The purpose of my sabbatical was to study the impact ICT has on student learning and the various ways schools are able to sustain the financial costs associated with this.

With the huge financial investments schools are now making with ICTs, I felt it important to visit and liaise with schools who were well underway in their ICT journey. I was interested to see what the driving force behind this was and the impact these tools were having in the classroom.

## **Rationale and Background information**

There is a great deal of pressure on schools to be up-to-the minute with ICT. Many schools who are ICT literate use ICTs extensively as a marketing tool and in many cases parents see ICT as a “magic pill” for their children's learning. Collectively, millions of dollars of locally raised funds are spent each year on ICT. At Ashhurst School our annual expenditure would be in excess of \$40,000 per year which makes it easily the largest single financial beneficiary in our budget.

There is a whole raft of evidence out there which supports ICT as well as some research which condemns it. I was eager to find out for myself just how impacting ICTs can be when used effectively and in particular the growing trend towards mobile devices such as iPads and iPods.

Some Australian studies have shown positive results regarding ICT and students learning. Laptops, wireless connectivity and a vast array of teaching resources will be made available to all Year 9 to 12 students in NSW public schools by 2013. This decision by the NSW government was based on evidence presented to it which showed where technology is used effectively in schools, the results showed improved grades, retention rates, greater participation by students and increased effectiveness by teachers.

Conversely, other studies conducted, especially around the use of interactive whiteboards, showed differing results. Newcastle University in the United Kingdom concluded that the millions of pounds spent on providing schools with interactive whiteboards in the belief that they could act as powerful aids to raising achievement were having no discernible impact on children's test scores. Once again this is largely subjective and comes down to the quality of the teacher and their ability to use the tool to maximum effect.

Our own New Zealand Curriculum reveals how ICT has a major impact in the world we live in and how these tools have considerable potential to support teaching and learning. The curriculum discusses how e-learning may:

- assist in the making of connections.
- facilitate shared learning.
- assist in creating supportive learning environments.
- enhance opportunities to learn through virtual experiences.

The Horizon's report 2011 states, “Digital media literacy continues to rise in importance as a key skill in every discipline and profession.....This year, mobiles have moved to the near term horizon because of a new class of devices, led by the category defining blockbuster that is the Apple iPad.....immensely portable, tablets serve as e-readers, video repositories,

and web browsing devices with constant access to thousands of apps - all in one package that fits easily in a book bag.....”

Prior to my research, I was informed of some initial reports indicating that iPads were relatively ineffective in classrooms due to the opinion they were more designed for consuming of information rather than creating it. I was particularly absorbed with finding out just how powerful these tools could be and what constraints they had.

The SITES 2006 conference publication (Law, Pelgrum, & Plomp, 2008) outlined studies conducted in 22 countries on the general credibility of ICTs in education. Conclusions from these studies suggested that:

- Computer access is a “necessary but not sufficient condition for ICT-use in learning and teaching”.
- Increasing access to computers per se doesn’t bring about better learning experiences.
- The way teachers create opportunities for learning with ICT matters.
- ICT adoption per se, doesn’t bring about changes to teachers’ pedagogical orientations; this needs to be deliberately fostered.
- The impact on learners is “highly dependent” on the “pedagogical orientation” that teachers adopt.
- “Analyses of the data revealed correlations between lifelong-learning-oriented pedagogical uses of ICT in teaching and learning and perceived gains in students’ 21st century outcomes. No significant correlations were found between traditionally oriented uses of ICT and students’ learning outcomes, as reported by their teachers”.

These point to key messages emerging in a number of studies related to e-learning: that teachers’ pedagogical purposes and intentions while embedding any ICT in learning is a critical factor in students’ learning.

I was also intrigued to gauge the impact the new UFB was having on learning. Was it making a difference? Where there more opportunities for parent, teachers and students?

Over the past two years Ashhurst School has been involved in the Te Apiti ICT Cluster. Considerable work was carried out to ensure learners were not merely consumers of ICT, but creators too. This methodology aligns itself very

closely with the Point England School “think, create, share” model. As we know ICT is a global phenomenon, and children who are computer literate at an early stage of their lives may deal better with the modern world according to some sources. A sound knowledge of ICT may make it much easier for children to find and organise information.

My own initial observations indicated that significant numbers of teachers were using digital tools to replace older technology (books, pens, pencils), without altering their pedagogy, therefore ICTs were having minimal effect on learning outcomes. Many research examples indicate ICT can only be effective if the classroom teacher has a sound knowledge of its possibilities and selects ICT tools purposefully in order to meet the learning intention of the lesson. This is supported by an OECD study where it is stated, “The provision of a tool isn’t enough, if people don’t know what it’s for or how to use it, but having them available can precipitate more effective learning relationships (Organisation for Economic Co-operation and Development (OECD, 2005). This is further supported by, The point about the embedding of technological tools into the natural flow of schooling is important. It describes the need to integrate, authenticate and develop purposeful learning, which is the role of the teacher. The PISA report into the readiness of students to fully take advantage of a technology rich world (OECD, 2005) noted that “it is clear then, that these conditions need effective pedagogical actions to translate these opportunities into actual learning outcomes”.

As Punya Mishra (2009) clearly pointed out, “if you’re not going to change pedagogy, then technology use makes no significant difference”. Basically, he asserted that increasing technology did not lead to student learning, but its effectiveness was entirely dependent on the teaching approaches used in conjunction with it.

The “relationship” dimension was of interest to me. Initially my thoughts around 1:1 laptop classrooms were fairly circumspect, as I considered social interaction to be key in assisting our children develop with the key competency model. However research pointed out, “Learning in an e-learning-rich environment may make peer and collaborative learning opportunities easier, thus supporting students’ cognitive, affective and social interactions. These ways of learning also appear to suit many New Zealand students, especially Maori and Pasifika” (Ako Aotearoa, 2008; Franken, May, & McComish, 2005). I also noted in these 1:1 classes there were many opportunities for children to enter into dialogue and reflect on learning.

As well as the Key Competencies, the Principles in the NZC “embody beliefs about what is important and desirable in school curriculum” (p. 9), and outline how “planning, prioritising and review” (p. 9) inform curriculum practices and

firmly centre attention on students and their educational needs. These Key Competencies therefore imply deliberate pedagogical planning on behalf of teachers. These statements presuppose a goal of lifelong learning and good citizenship, and link to teachers paying attention to technologies at the centre of students' lives and using them educationally.

Clearly for this to be effective in New Zealand schools, teachers need to understand how to get the best out of e-learning tools: time, space, place, and opportunity. There is a trend emerging about the importance of teachers' active presence and roles in classrooms using e-learning tools. E-learning tools can motivate and engage students. These are surely critical factors in leading to improved educational outcomes.

World-wide research describes how potentially blogging can make a significant difference to children's learning in a number of ways. As a teaching and learning tool, blogging creates multiple opportunities for feedback, lesson planning and creative learning. A number of international studies have also shown blogging inspires boys to write. Student voice from my own work supports the use of blogging as boys see it as writing for a purpose. The fact that someone will read their writing and enter in to dialogue was a contributing fact to its success.

## **Methodology**

My approach was quite simple. I would visit a number of leading ICT schools around the country to view best practice and engage in meaningful dialogue with both teachers and children. This would be supported by reading the latest literature on ICTs and draw some conclusions based on this information.

## **Findings**

One of the most powerful aspects amongst New Zealand schools is an openness to share ideas, best practice and thoughts on the future of education. We are, in most schools, fortunate to have supportive Boards of Trustees whose job it is to listen, challenge, and support the leadership team and staff of the school in creating improved learning opportunities for students. This happens in a range of ways, with professional development being at the forefront. Schools' spend thousands of dollars each year on providing opportunities for staff to collaborate freely with other schools both around the country and abroad. Each of the schools I visited shared this belief and did not see themselves as "experts", in fact quite the contrary. Like Ashurst, they were merely on a journey and enjoyed sharing their practice and refining teaching and learning in their schools. In all cases children were

at the centre. Schools had different approaches, used different ICT tools and brands of computers.

Some of my key findings were:

The ICT spend is only effective if it is well supported by professional development opportunities for the staff. This was a common thread and was carried out in a variety of ways listed below.

Schools used release time effectively to provide opportunities for learning. In some cases classroom release time (CRT days) were used by the classroom teacher to release specialist teachers for subjects like music, science and ICT.

Other schools utilised the children as the experts and teachers made opportunities for the children to share new learning opportunities. This was particularly powerful in developing school wide capability.

Other schools had optional staff meetings at various times of the day where staff could opt into sessions depending on their needs. These sessions were operated by both staff and or children. In some cases they were breakfast meetings and in other cases they were after school sessions.

In one school there was a conference day where the children ran a mini “U Learn” conference where parents were invited. There were key note speakers and conference options where children chose which sessions they would attend. This was a great way of developing knowledge and expertise across the school.

Various schools had external experts working with the full staff and sometimes the ICT leadership team. The focus was to build in-school expertise so the reliance on outside assistance was minimised. Some schools had learnt this through experience, when one or two key people had left and with them went the entire school’s expertise. The ICT lead teachers appreciated building school-wide expertise as these individuals became part of a larger pool to assist those less confident staff members. It meant these staff members were not so reliant on the services on the ICT lead teachers. For them it was important to keep the main thing (teaching their own class) the main thing and not spend hours dealing with mundane ICT issues.

A number of schools used the students as the experts. In all cases the children enjoyed being in the “teacher role” and were excited to pass on their knowledge to other learners and enjoyed the kudos that came with this. For some staff it was initially challenging to “hand over the power”. However they

did not want to be the piece in the puzzle that was stifling learning opportunities for the students.

Teachers felt ICTs made for more collaborative learning with their peers, not only in their own school, but outside. The ability to share in writing moderation was one example that comes to mind, where a teacher in Auckland did a considerable amount of collaborative learning with peers in Wellington.

All the schools I visited felt ICT had an impact on learning, although not all could categorically say ICT was improving performance. Most felt it was too early to tell. They believed they were improving the manner in which they used the tools and expected in time this would transform into improved learning outcomes. Nearly all children enjoyed learning through this medium and perceived they were more engaged in their learning as a result.

Children typically preferred to “write” on a computer than in a book with pen and paper. They had varying reasons for this including, “you don't have to worry about how neat your work is”, “it is easy to fix mistakes with tools such as track changes” and “I can share my work with more people and get feedback on my learning”. Students enjoyed the opportunity to write on blogs and receive feedback through this means. They felt it was “great because we are writing for a real reason”.

Research from Dorothy Burt and the Manaiakalani Cluster in South Auckland delves into the concept of the Literacy Cycle (identifying how reading, writing, listening, speaking, thinking fit in - traditional work - digital work) and the importance of kids of today having the opportunity to let the learning continue to develop beyond the classroom. She states, “The Literacy Cycle concept has emerged from the opportunities offered by Web 2. We still desperately need quality English/Literacy teaching occurring in our schools as the foundation. But 21st Century students need opportunities to **do** something with the learning outcomes in their own language i.e. turn them into a digital learning object that they have created. Then this digital learning object can be shared online in a Web 2 environment where it can live on and on and on.... And it is here that more opportunities for engaging students in literacy learning can occur, through the threaded conversations and reflections”.

The children at Point England School very much reiterated what Dorothy Burt said. By talking about their learning with peers, family and friends they were able to enhance their understandings and further develop their thinking. They saw this form of learning as exciting and meaningful and enjoyed the fact they would always have an audience and a purpose for their work.

New Zealand students have less contact time than many countries. ICTs have the potential to extend this learning time in meaningful ways. The

students are able to collaborate through on-line discussions and were motivated to do so. They are engaged and inspired through the use of these technologies and feel empowered to share their learning with the world.

Several of these schools worked in clusters, either through being directly involved in an ICT Cluster or had developed their own working relationships to good effect.

Some schools were more differentiated in the way ICT was used with Years 1 - 4 using traditional books, supported by ICT and Years 5 - 8 children having their own devices. The Manaiakalani Cluster, which both Panmure Bridge School and Point England were part of, had a community wireless network which enabled them to learn anywhere, anytime, any place. The real strength in this cluster was that it started in the pre-school environment and moved through to high school giving it strength and credibility. One of the challenges some primary school educators faced was that many high schools in their areas are "chalk and talk" and convincing parents of the benefits of ICT can be difficult, especially when they may not see a computer throughout their high school years.

Collaboration was an area principals, families and teachers felt had been enhanced through the use of ICTs. The ability for a parent to e-mail a staff member with a query was very powerful and efficient. Class blogs where families were kept up to date with what was going on in the classroom and the fact that in many cases these blogs were collaborative made them particularly powerful.

Probably the most inspiring finding of my sabbatical was seeing how effective iPads can be in the right hands. The engagement of the students was something that stuck in my mind. They wanted to find out, they wanted to create and most importantly they were inspired to improve their current learning levels. Many of these children were, prior to iPads, reluctant learners. Both teachers and principals I spoke to believed in class behavioral issues had been dramatically reduced due to increased ICT access to the learners.

iPads were being seen by many of these schools as a viable option due to their increasing affordability and the creature nature of the applications. The battery life of the iPads was also a major plus. Having ten hours of learning time without interruption was something teachers were really excited about. No longer were they having to charge laptops during the day, instead they could do this overnight and get the full benefit the next day.

Many teaching staff already owned their own iPad or iPod, so they were familiar with them which in many cases removed the barriers to learning immediately.

The affordability of these mobile devices was an added incentive. The iPad and iPod were both affordable options and schools who had a sound knowledge of their possibilities did not see the need to buy laptops when they could get three or four mobile devices for the same price. A number of schools had decided the iPad was the ultimate machine and at this stage will replace their Mac Books with iPads when the time came. They felt, "the iPad is a genuine "just in time" mobile device for learning. Students can access information, applications and presentation mediums at any time when they identify it as the best tool to benefit their learning".(Selwyn Ridge Primary School). The iPad was seen as a truly mobile device which encompassed all the necessary learning tools. They were viewed as an all in one device.

Another interesting finding was that ICT can be used effectively at all ages. It was satisfying to see how quickly Year 1 & 2 children were able to maneuver these technologies and produce stunning examples of quality work. In many cases teachers were seeing some real shifts in learning. They felt this was because during non-teacher time the students were engaged in ICT related activities which were supporting the learning intention, so they were in effect doubling their learning time. The ICT device was not just a "babysitter" being used to keep the students quiet, as unfortunately can sometimes be the case, but was being used to reinforce concepts.

Bring Your Own Devices (BYOD) was something several of the schools were giving consideration to or were already implementing. These schools had carefully worked through the risks involved, such as loss or damage to equipment and took strategic measures to minimise the potential hazards. For these schools the BYOD journey appeared to be fairly smooth and obviously allowed greater access to technology for all children. What it did create to a small degree was the "haves and "have nots". In some cases the "have nots" were simply because caregivers did not want their children taking an expensive device to school. However, that aside, it did free up more devices in the classroom.

Surely BYOD is the way of the future. As these devices become more affordable, most families will be in a position to purchase them and take the associated risks in sending them to school. Already many high schools around the country have digitally orientated classrooms where the students take their own devices. BYOD will remove the huge financial pressures from schools and will offer more students opportunities to engage in learning through ICTs.

Several schools had developed “e-competencies” which were incorporated as part of their appraisal system. Under these competencies, minimum requirements were set out as far as expectations for ICT use by teachers. In other words, how often emails were to be checked, expectations of blogs or e-portfolios etc. This meant there was no room for passengers and you either got on board or you looked elsewhere for an environment more suited to your style of teaching.

### **How were schools managing the costs**

This aspect was of particular interest to me. As mentioned earlier, there is an expectation that schools need to provide these new technologies, however the operations grant does not easily allow for this to happen.

In many cases equipment was purchased through pub charity grants. Although a number of schools commented on how it was becoming increasingly hard to access these funds. One school had a very close relationship with a trust and had recently acquired funds to buy an iPad for every student in the school. This had changed the whole culture of the school and the children were incredibly proud of their learning and their school as a whole.

Several schools were rolling over their purchasing with depreciation. In fact most of the schools I visited owned their own devices and were setting aside the depreciation each year to buy more equipment.

School Parent Teacher Associations (PTA's) were a prominent financial source for all schools. In a number of cases large donations were made each year to enable the students to benefit from these technologies.

Lease options were common and in some schools there was a mix of lease and purchasing taking place.

Two of the schools I visited had very close relationships with business organisations. This meant they received pre-loved equipment regularly. While many of these machines were over three years old, they were still effective and contributed positively to the classroom environment.

Cloud options instead of servers was something one school was closely looking into. Their server was nearly at the end of its life and rather than spend extensive funds on a new one they were looking at the “cloud” which, on the surface, looked highly promising and more financially viable.

Technical support had a significant financial impact on all schools I visited. Some schools found ways around this by employing a technician across a cluster of schools which was a financially positive move. Several schools also had expertise in their own environment. They were able to release key staff members on a regular basis to maintain equipment. Most of the schools were

reliant on an outside provider to take care of this work. It was financially impacting for these schools and something they would like to address. While some of these schools had staff who were able to fix minor issues, they wanted their teachers in front of their classes rather than dealing with technical issues.

One school had a parent with skills in the IT industry who was able to provide the school extremely competitive rates.

Some schools had contracts with companies which gave them a set hourly rate which was more competitive than the traditional market rate. However, they were locked in to a set number of hours, regardless of whether they used them or not.

As you can clearly see there was no “right” way of addressing the affordability issue. Schools approached this matter in a whole variety of ways and it typically came down to the personnel they had at their finger tips. What was impressive was that all schools improvised in the typical “kiwi way” and made things happen for their kids. Regardless of the barrier, they found a way to get around it and were well supported by their communities along the way.

## **Implications for Ashhurst School**

The most important factor in the success of any learning tool is the teacher. That is, the teacher’s competence, skill, passion and expertise. This is the same everywhere. Effective teachers of writing are always examining and refining what they believe makes a successful writing programme. It is the same with ICTs. To be effective you need to put in the time. As Malcolm Gladwell states in his book *The Outliers*, “researchers have settled on what they believe is the magic number for true expertise: ten thousand hours.” It was the same with Bill Gates and The Beatles. They put in huge amounts of time and energy to become leaders in their respective fields. To use ICTs effectively teachers must put in the time and make the professional development opportunities they are provided with.

We need to look at these professional development opportunities and make sure they are meaningful for teachers. We need to make sure at Ashhurst School that we are developing capability amongst the staff so that when key individuals leave we are still in a strong position moving forward. We don’t want to always be reliant on outside providers doing the work for us.

The BYOD initiative has to be the way forward. It would take a huge financial burden off schools. However, it needs to be transparent and supported by all parties for it to be successful. There needs to be solid ground work initially to

make sure we have all bases covered rather than rush in and make ill-informed decisions. Parents need to be further educated as to the benefits of these technologies. This can be done through parent evenings, in-school support programmes and involving the parents in their child's learning.

iPads are wonderfully creative machines. I envisage trailing these in several classes with key users initially so that we have a number of "in house" experts. We need to iron out the potential issues before they are rolled out to all staff. Most importantly we need to have clarity in our teaching pedagogy so there is buy-in from all staff. The schools that were using these most effectively introduced a small number of apps initially and then made time for staff and children to discuss their effectiveness.

In order for ICT to be fully successful at Ashhurst School we need a reliable network. The UFB connection will be in place by the end of this year and from what I have seen will open up more possibilities for the teacher and students, particularly once our SNUP upgrade is in place.

## **Conclusion**

There are many challenges ahead not only for Ashhurst School, but for the whole education sector in getting the best out of ICTs. The future of ICT at Ashhurst School does not lie in constantly buying more, better or newer ICT applications, but using what we have to it's potential.

The way forward for us will be to develop our pedagogy further and create opportunities for staff to embrace these technologies in a supportive, but challenging environment. There needs to be an expectation that all staff will contribute to our 21st century learning environment.

Common research and my own inquiry has shown there are many benefits of ICTs in the school environment. Students' engagement and enthusiasm for learning is certainly evident. There is real credibility on the learning front for ICTs when children want to learn, create and share with whanau and engage with online learning forums outside of normal school hours.

The financial implications of ICTs can be addressed through BYODs and in time I believe this will be the way forward. While the financial burden may remain a heavy for years to come, the enthusiasm for these tools will overcome the barriers. There are many exciting learning opportunities for all stakeholders and we need to embrace these technologies and make the best possible use of them. We certainly live in exciting times.

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