INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

Huge benefits for engagement of learning with use of IT ... Future education should use IT in a seamless manner

(School principals’ meeting)

INTRODUCTION

The majority of respondents to the Information and Communication Technology (ICT) section of Excellence and Innovation consultation saw technology as an integral component of teaching and learning as well as a methodology through which individuals can be empowered and take greater responsibility for their own learning. The term ‘connected learning’, while not specifically used by respondents, encompasses this view.

The kids are the real experts when it comes to ICT. Most adults (including teachers) can’t even program a VCR and we have to get their kids to show us how. It’s the same thing when it comes to learning how to use all the features of a mobile phone such as SMS TXT messages and sending digital photos. Kids grow up naturally with the technology and take to it like ducks to water. (School P&C)

The NSW Secondary Principals’ Council suggests that:

The classroom of the future will be technology rich. To an increasing degree, communication and collaboration will be facilitated by technology. The creation of knowledge by students undertaking rich tasks will increasingly be facilitated and the results presented and distributed using technology. (NSW Secondary Principals’ Council)

A scenario presented in the joint submission by Cisco and Microsoft perhaps best describes the current ICT dilemma facing education and training.

A typical teenager comes home from school. Some of the classes will have used computers, but many would not. Much of her work will have been book and paper based. She gets home and, within minutes, has logged onto her favourite instant messenger program, where she starts several conversations, some with her school friends talking about the events of the day or perhaps a homework chore, some in larger chat rooms with participants from all over Australia and the world. She uses the web for research to write an essay or part of a school project ... The next day she heads back to school, quite possibly to spend an entire day engaged in the business of learning without seeing, much less working with, a laptop or any other digital device. (Cisco and Microsoft)

The gap between ICT access and use at school, home and in business is considerable and was raised by a number of respondents during the consultation.

Do we want schools to LEAD or MIRROR the HOME or the WORKPLACE? (Parent)

This ‘gap’ has also been identified as a significant issue in the United Kingdom where Derek Twigg, Parliamentary Under Secretary of State for Schools, is recently reported as stating:

Imaginative use of ICT will open up a new world of possibilities in education. Digital technology is already changing how we do business and live our lives, we need to embrace this revolution within the education sector. (Twigg 2005)

The NSW Government has, over the past decade, invested significantly in the development of ICT infrastructure in NSW government schools. To date, the Government has:

- purchased over 200,000 computers for schools
- connected every government school to the Internet
LEADERSHIP

A number of submissions consider leadership at all levels of the organisation critical in achieving ICT advancement in schools and TAFE.

The Cisco/Microsoft submission, for example, states:

The process of ‘connected learning’ draws heavily on the capacity of both system and school/college leadership to define and explain the vision for teaching and learning and then to harness the available skills, resources and experience to achieve it.

Further supporting this view Dr John Schiller of the University of Newcastle writes:

Without the support of school leaders, particularly the principal, the educational potential of ICT may not be realised. Principals need to assume a major responsibility for initiating and implementing school change through use of ICT and can facilitate complex decisions to integrate ICT into learning, teaching and school administration. (Academic)

The critical role of leaders is discussed in detail in Chapters 3 and 5 of this report.

TEACHING AND LEARNING WITH ICT

Professional Learning

A majority of respondents spoke of the continuing need for teacher professional development in the areas of both learning to use the technology and applying that knowledge in a balanced way in the teaching and learning process.

Teacher’s skill levels in ICT need to increase through provision of adequate professional development funding. Teachers should be assisted and encouraged to integrate ICT into most areas of the curriculum. (School P&C)
Teachers need the guide-on-the-side in the classroom with them until they are confident themselves with the new technology. (School community)

While one student commented:

Some teachers are so bad at technology. They don’t know enough – like about computers and DVDs. A lot of time is wasted. If teachers know about computers it’s good. If they don’t, there’s no-one to help them. It’s woeful. (Young person interviewed by Commission for Children and Young People)

There was widespread support for the enhanced provision of pre-service education for school teachers including:

Trainee teachers need to be encouraged to respond using different multimedia whilst in training. Essay writing isn’t a really big skill needed in a primary school, yet it is how the students are mainly assessed. If they were asked instead to create a website, make a PowerPoint presentation of a book or present findings on a spreadsheet then you would get the kinds of skill development needed for when you go teaching. (Parent)

There was also a call for professional learning opportunities for support and administrative staff in the use of ICTs to manage the assessment of student learning outcomes.

DET must provide support for ICT integration into schools and TAFEs through more than simply sending out support documents and manuals; staff need to be trained on-site, tailored to a school’s needs. (School staff)

Some respondents saw value in the ability to access quality professional learning opportunities on-line at school or college and from their home. Some expressed concern about required computer competencies and the time that would be needed to participate in programs.

Some respondents supported the provision of training and development opportunities for parents to act in partnership with schools through ICTs.

Offer parents training in ICT so that they can assist their children at home. (School community)

Teaching and Learning

Many respondents emphasised the need for quality teaching to stimulate learning and reinforced the need to see ICT as a ‘tool’ to support learning.

ICT is a tool, it is not the big picture by itself. It must first be quality teaching. (Regional ICT Committee)

Computers are purely a tool or resource to enhance effective teaching and learning. (School staff meeting)

Many respondents commented on the role of ICT in personalising learning and allowing students to engage in learning when, where and how they choose.
Personalised learning and modern Learning Management Systems will allow students to engage in learning experiences anywhere, anytime. (Centre for Learning Innovation)

ICT can therefore be used for one on one tailored tuition for each individual student rather than the necessity of a teacher teaching a whole class the same things (whether a student knows them or not) at the same pace (whether the student just needs a quick introduction or need to reflect in depth to understand). (School P&C)

In addition, many respondents strongly supported the ongoing integration of ICT across all learning areas.

ICT needs to be integrated effectively into all KLAs and not just used for word processing. (School staff meeting)

Consider use of ICT as a learning tool in all curriculum areas, rather than solely for computer studies. (Northcott Client Services)

A number of respondents commented on the need for schools to provide greater access to ICT services and facilities both in and outside normal school hours. Increased access to ICT was seen as essential in achieving individualised or personalised learning.

Schools’ ICT resources able to be accessed out of hours (internet cafe type of set up) – should we have different ‘sessions’ for schools. (School and TAFE staff meeting)

There was also a comment that the needs of school students and TAFE students were not the same. The NSW Secondary Principals’ Council, for example, stated:

We also need to recognise that schools and TAFEs are very different in their application of technology in learning. TAFE students access whole units of work online whereas school students need to plug in and play/explore a whole variety of multi media applications. (NSW Secondary Principals’ Council)

A number of TAFE staff stated that the needs of students were better met through ‘blended delivery’, the use of ICTs, including on-line delivery, together with a range of other teaching and learning modes. This was seen to be an effective means both of supporting students as they master the use of ICTs and of addressing the preferred learning styles of different students.

Blended delivery is a better alternative to totally ICT-based learning in the ideal learning environment. We need to be aware of the cost effectiveness of using ICT as an approach to teaching and learning. Often a person will learn more effectively if taken out of an ICT environment – rely more on their cognitive skills. (TAFE staff meeting)

Some respondents expressed concern that TAFE was being left behind by universities in its uses of technologies. They also described the community’s expectations with regard to the provision of ICTs in TAFE, specifically on-line resources, and described the significant investment needed to develop and maintain on-line resources.
Maintenance of online learning materials is a major issue. ... Huge expectation by students and communities that TAFE will have high quality online resources. (TAFE staff meeting)

Some respondents indicated that ICTs were not necessarily applicable to every situation. Given the importance of on-the-job delivery, it was felt that in some contexts distance learning delivery through ICTs would not allow students to gain all the skills and knowledge they needed.

For TAFE staff, another key issue was the extent to which ICTs were now being used in industry. This meant there was a need both for students to have industry standard equipment and facilities but also a need for staff to have professional development which ensured they were up to date with industry standards.

APPLICATION OF ICT

Use of Technology

A number of respondents suggested that the use of technology to enhance learning was well behind the level of technology used in the wider world. Charles Stuart University stated … use of technology and web based learning are [both] areas whose potential is still to be fully realised.

The use of technology to overcome the ‘tyranny of distance’ was also raised by respondents and, by some, was seen as critical in maintaining high standards of access and delivery to rural and remote students, their teachers and parents.

Respondents frequently stated that effective student and teacher use of ICT will facilitate access to a variety of on-line services that increase learning opportunity. Schools saw a high speed broadband link as essential in ensuring this effective use of on-line services.

A one size fits all approach does not deliver at school level. A school with a 2mb connection and 250 students has a much better system than a school with 1050 students and 2mb connection. (School principal)

Respondents spoke positively of the increased use being made of school websites as a communications medium with their parents and communities.

Make use of excellent sites already in existence e.g. ‘capnsw’ and school websites – there are so many good things happening already ... (TAFE and school staff meeting)

The issue of email addresses for students and staff was of concern, with one school requesting a revision to the ISP web services contract, to take account of the limitations in resourcing available to support the system outlined in the contract.

Some respondents suggested a range of communications strategies that could be used to engage parents in their child’s learning, including SMS messaging, e-mail and web based communication.

Parents can access the school site and view the homework, marks, due tasks and events relevant to their student. Such
access keeps families with Internet access fully informed of progress and on activities and is of benefit to families. (Centre for Learning Innovation)

Some respondents raised the issue of computer access in the home. They felt that electronic communication was not appropriate as the sole means of communication with parents. Access to computers and the capacity of many families to afford on-line services were seen as issues that influence a school’s communications policy and the assumptions that underpin the extension of curriculum opportunities on-line. One principal stated:

I think about 60% of families in my school don’t have the technology, so that’s 60% that miss out if you use it (only) for communication – an equity issue. (School staff meeting)

A number of TAFE respondents identified the advantages of on-line learning, particularly in relation to distance and remote students access:

Delivery of TAFE courses online has the ability to increase access for a range of students, who do not have the opportunity or ability to participate in face-to-face teaching. (NSW TAFETA - Outreach Special Interest Group)

**Infrastructure**

Many submissions spoke of the frustration experienced by teachers, who were not technicians, in maintaining school networks with a number proposing strategies such as:

(We need) Qualified or trained technician to team teach with untrained / unconfident teachers to improve and upskill staff. (School staff meeting) and

Take the ICT budgets away from the school, employ technical support officers who oversee a group of schools to visit and repair, install, in-service, etc … (School staff member)

Respondents were also seeking training to give them the skills and knowledge to maintain their ICT systems or effective support through qualified personnel responsible for undertaking these tasks.

Many respondents expressed concern at the capacity of schools to ensure an equitable supply of up-to-date computers and peripherals.

… if DET was fair dinkum about technology in schools then we would be supplied with computers and peripherals such as printers, scanners, digital cameras etc. And computers would be leased and replaced every 3 years … Site licenses are useless. We can’t afford them. (Personal submission)

These comments were echoed in submissions from TAFE staff who were looking for better levels of support from IT areas and the provision of opportunities for teachers to enhance their skills, knowledge and ability.

Students are our business and if the IT support service is unwilling to support the curriculum we will not be in business as far as IT is concerned. (TAFE staff member)
The provision of laptop computers for teachers and students was encouraged by some writers. Some suggested the Government develop an incentive scheme to assist teachers and parents to purchase laptop computers for use at home.

A number of respondents identified difficulties with older school buildings, including the inflexibility and size of rooms, limited power supplies and problems with cabling.

*If 21st century schooling is to engage young adolescents born after 1987 we need to tap into their cyber world and move from the industrial age chalkboard/whiteboard to a technology saturated learning environment where there is fast wireless internet access in all classrooms.* (School staff meeting)

**Support Systems**

A number of respondents were enthusiastic about the use of ICT to support student administration.

However, criticisms were levelled at DET for the ineffective implementation of earlier ‘solutions’, including KIDMAP; and the need for an updating of the OASIS system. This was seen as a serious barrier to more effective student administration practices.

Cisco/Microsoft in their submission presented a more global view:

*It’s proving to be difficult in jurisdictions around the world to respond to an uncomfortable combination of new teaching and learning demands, dramatic shifts in technology and a difficult set of organisational challenges including an ageing workforce, out-of-date administrative systems and funding constraints.* (Cisco/Microsoft)

The same issue appeared in some submissions from TAFE staff and the NSW Teachers Federation who state that the implementation of systems such as CLAMS (Classroom Management System) have increased teachers’ workloads and need to be supported appropriately. A solution to this is proposed in the submission from the Sydney Institute ICT and Systems Committee, who wanted to see the integration of some existing systems and some other systems removed.

A number of TAFE staff also mentioned the EC system and called for increased flexibility or its elimination. However, this is generally described as a barrier to flexible teaching practices rather than an ICT issue.

**System Standards**

Some respondents felt that a number of barriers could be removed through the implementation of standards for common platforms and equipment which ensure that computers and computer systems are able to talk to one another.

These submissions also stated that the implementation of standards would provide both efficiencies and cost-saving to the Department. One of the underlying problems is outlined in a submission from the DET Information Technology Directorate - Technical Services Branch:

*Classroom codes (should) be updated to include wireless networks so that every classroom and outdoor area can be a technology classroom.* (NSW Secondary Principals’ Council)

*Many schools are still running standalone computers in classrooms with no access to internet or other DET and school resources.* (DET staff member)

*The current OASIS system for whole school administration is a significant roadblock.* (NSW Secondary Principals’ Council)

*The implementation of CLAMS and other administrative duties being undertaken using computer technology has increased the workload for many TAFE teachers. Such systems or technologies must be supported by the appropriate level of resources, training and IT support.* (NSW TAFETA Outreach Special Interest Group)

*Large amounts of resources are given to schools, often with no effective support.* (ITD Applications Development Branch)

*Speed up the integration of Web Services/CLAMS/Janison* (TAFE SI ICT committee)
All workstations in schools and TAFE need to be connected to the DET wide area network with remote support provided to ensure the reliability of the DET wide area network and the school local area network. The introduction of a small number of standard operating environments will allow for greater efficiencies and cost savings to DET. (Centre for Learning Innovation)

We need to resist the notion that common operating systems and support systems can work effectively across both schools and TAFE. Schools have spent years and years building up their own specialized and individual networks. Being required to ditch these now and conform to prescribed regional specifications will only pull back schools which have made considerable progress on their own. (School staff meeting)

Lack of classroom technology standards also inhibits student mobility, content sharing and technical support. DET should enforce a single technology platform within classrooms. (Personal Submission)

Breakdown the traditional emphasis on teachers knowing everything and develop more of providing pointers to where learners can find information. (Catholic Education Office, Lismore)

The idea of fixed classes and streamed classes will become irrelevant. Each individual student will be streamed according to his needs e.g. one primary student may be doing high school maths, while another may be writing novels. Teachers will become more facilitators of student directed learning rather than teachers of pre-digested information. The socialisation role of schools will become more important as more technical knowledge is obtained from technology. (School P&C)

Question. How many finance systems does DET have? The answer might be - JDE, TIFS, 2200 + Oasis, 3000+ middle level manager Excel, Access and similar system. This is a total 5000+ finance systems. Similar comments on HR. Question: Is having 5000+ finance systems best practice. It is likely that this style of solution is very high cost. (Information Technology Directorate - Technical Services Branch)

The concept of a common operating system was not always endorsed by all respondents, either from schools or TAFE, or from the community. Respondents from both schools and TAFE described the separate progress that has been made in each sector and were concerned that any movement towards system standards did not set back the progress that has already been made. There was also a concern expressed that a one-size-fits-all approach would not take account of the needs and capacity of different schools.

Some respondents also raised the issue of open source as opposed to proprietary software. They wanted to see students exposed to a wider range of ICT products, rather than only a particular suite of products. While other respondents suggested using the purchasing power of DET to drive better deals on software and hardware. For example, a TAFE Institute ICT Service group suggested the DET should:

Conduct software audit in schools and TAFE Colleges to rationalise the use of software across the state and achieve economies of scale in pricing of the software. (South Western Sydney Institute ICT Services)

IN SUMMARY

That the vast majority of respondents expressed positive views when discussing the role of ICT in teaching and learning and, from the comments, it can be concluded that teachers, students and parents are wanting to be more engaged in technology based learning.

Huge benefits for engagement of learning with use of IT. … Future education should use IT in a seamless manner. (School staff meeting)

I would like to see a web site to assist parents in seeing where their child should be in a learning year. If the child is having difficulty in certain areas then the parent should be able to access on-line further lessons to make the child confident in this area. (Parent)

While providing support for ICT in teaching and learning respondents recognised the importance of quality teaching and the role of teachers in engaging students in learning.

ICT will not solve all educational problems for teachers and learners. The quality of the content is more important than the newness of the technology. The key ingredient is the calibre and availability of the learner/teacher interface that is supported by the technology. (TAFE staff meeting)
So what does all that mean for the way we conduct education and training? What have been the implications for the learning enterprise in New South Wales?

… the dramatically increasing need for personalising the learning experience for students such that we pay more than lip service to individual differences. This can only realistically be achieved if we are able to connect all the elements that surround a child’s learning experiences. (Cisco/Microsoft)

The full impact of ICT on school and TAFE teaching and learning practices, administration systems and communication is yet to be realised.

The need to focus on the learning needs of individuals is a key outcome from a number of papers in the Excellence and Innovation consultation. It is clear from responses that ICT is a means through which this personalisation of learning can be achieved.

However, in order to move towards a more personalised approach a number of issues have to be addressed, including the need for:

- vision and leadership in schools, TAFE and the system generally
- support for all staff to enable them to use ICT better and more strategically
- opportunities for students and teachers to advance personal skills and knowledge
- clear guidance for teachers on how best to incorporate ICT in daily teaching and learning
- access for all students and teachers to relevant and up-to-date technology
- appropriate systems to support the current and future function of DET.
Reference