FUTURE USES OF TECHNOLOGY IN RURAL AND REMOTE SCHOOLS REPORT

INTRODUCTION

The Rural and Remote Education Advisory Council strongly supports the fact that technology has the potential to contribute to the overall improved quality of teachers, attraction and retention, student achievement and community development/sustainability.

There is widespread recognition that regional development in the 21st century will be closely tied to the effective use of new and emerging information communication technologies expanded by the National Broadband Network (NBN) roll-out in Australia. Within the educational context, these connective technologies can also offer unique solutions to persistent problems in declining enrolments, limited course offerings, limited Advanced Placement opportunities, and data collection. Technology can be a key enabler for:

- improving the quality of teachers by offering professional learning opportunities and building Communities of Practice online;
- improving teaching and learning by offering online subjects to students;
- attraction and retention (students and workforce);
- aspiration, access and achievement, complementing face-to-face engagement; and
- community development/sustainability through connectivity where ever you are.

Of equal importance is the expertise and knowledge of the people using technology.

CURRENT SITUATION

The use of telecommunications technology within educational environments is set to increase dramatically over the next five years as high-speed fibre-based broadband becomes widely available in Australia. Simultaneously, the capability of Internet services devoted to e-education purposes is set to increase exponentially. Connecting and collaborating through technologies is emerging as a powerful tool for motivating and engaging both teachers and learners within schools, and schools with their broader community. This increased connectivity provides students and teachers access to a wide range of online resources and websites that bring much of the learning alive.

Coupled with the direction of the current Federal Government with the Digital Education Revolution (DER) and the Digital Regions initiatives, opportunities for better serving regional, rural and remote communities will become a reality.

In Western Australia all government services are operating their own systems. For example three education systems/sectors operating include the Department of Education (DoE), the Catholic Education Office (CEO), and the Association of Independent Schools of Western Australia Incorporated (AISWA).

As noted by Trinidad (2007):

"Each of the three education systems/sectors, the Department of Education and Training (DETWA); Association of Independent Schools of Western Australia (AISWA) and the Catholic Education Office (CEO) have set up telecommunications networks to improve learning opportunities for students and administrative services for staff. The aim of each telecommunications system is to provide a virtual private network (VPN) with access from

anywhere, anytime and ultimately reduce the feeling of professional and social dislocation experienced by many teachers and students in the isolated communities"

CASE STUDY 1 – Australian Independent Schools of Western Australia (AISWA)

AISWA has 41 schools in rural and remote areas, with 13 of these remote aboriginal schools. As a sector, not a system, AISWA schools are responsible for their own technological infrastructure and determining the best way to ensure students have ICT competencies and can use technology as part of all learning. AISWA is the association of schools to which all independent schools in WA belong and support schools in developing ICT plans, providing professional learning to support teachers and students and manage the roll out of the DER computers.

AISWA believes strongly in the need for teachers to have the capabilities to use technology to support student learning and recognises that the pedagogy of delivering programs using ICT is different from more traditional delivery methods. To this end AISWA has rolled out the European Pedagogical ICT (EPICT) Licence across schools.

Internet connectivity for schools continues to be an issue particularly in rural and remote areas. In 2011 AISWA launched AISWANet which is a partnership between AISWA, Telstra and AARNet, to provide schools which much faster access, larger downloads and access to a range of online services through AARNet. This solution is offered to schools and they make the decision to join, or not, and a number of regional schools are now enjoying much great access than in the past. The take up of this is slow as many schools are still in other contracts but for some schools in the south west and great southern this option has provided them an excellent solution to poor connectivity. AISWA has 13 remote schools which all access the Internet via satellite. All these schools received funding through the Bush Schools Network Project, which mainly focussed on upgrading the schools internal IT infrastructure. Consequently many of these schools have quite good IT networks.

The problem however, is their connection to the Internet is still very poor. Many schools experience at best a 2MBs download and only 512Kbs upload. In practical terms, it means that in a class of 15 students working online with Scootle Learning Objects, only five students will actually be able to access the site and gain a meaningful educational experience. Speed of connection continues as a big issue in such schools, as does the cost of downloads. For many remote schools it can be prohibitive in terms of cost particularly towards the end of the month when the school reaches their download quota and excess charges are about to be incurred. Some schools restrict student access during this period so as not to be presented with a large bill from their ISP.

AISWA began a conversation with Telstra some time ago to reach an agreement to provide these remote schools with a better satellite service which would connect through AISWANet. Unfortunately Telstra do not have their own satellite service so the discussion was with a 'preferred provider'. The costs were very high for a service not much better to the one described above however, the benefits of a limited contention based service i.e. as few as possible sharing the link coupled with a generous or unlimited download\upload allowance is the goal ASIWA should be striving to achieve for their member schools.

As a sector, AISWA does not have a VPN established currently, although extension of AISWANet across more schools would be wonderful to improve communications between schools but this will take time. Through the AISWA web site schools are offered a large range of support materials and links to useful sites, but schools will remain strongly independent so AISWA is not likely to develop an information management system for the sector.

CASE STUDY 2 – Department of Education (DoE)

The Department of Education currently delivers an array of technology-mediated services including reporting, online teaching resources, web conferencing, online teaching and learning, and online professional learning, complemented by the necessary support and start-up training. While the access to quality teaching, quality resources, secondary level courses of choice and peer support are critical factors in student achievement, decades of studies into regional and remote education have highlighted the disparity in access between metropolitan and regional students. The gap in access is widening as metropolitan students enjoy unfettered access to continuous high speed internet and to the technical support that ensures available technology is optimised.

This issue presents the greatest challenge to providing equitable access to education across the state today. Every child and young person has the right to access schooling that provides them the greatest opportunity to achieve in education and in life. The Department of Education is committed to delivering a strong public education system that enables each school to be a good school and every teacher to be an effective teacher and every student to be a successful student. However, it is difficult to achieve these aims while regional and remote schools continue to operate at such a disadvantage.

"I before E" – Infrastructure before E-Schooling

Improving the ICT infrastructure in all regional schools would provide fast, reliable and managed broadband and computer support services. This platform is critical to delivering the Department's E-Schooling vision through which students and school communities could utilise the services that best meet their needs.

As part of the National Secondary Schools Computer Fund (NSSCF) 1:1 rollout, all students in Years 9-12 will receive or have access to a computer device. This infrastructure will be under-utilised without support to up-skill teachers to make best use of this opportunity in an online environment.

Reliable and fast internet connections could provide the foundation for enterprise-wide web conferencing, learning management, reporting and collaboration tools that create an engaging, online learning environment between school sites. This infrastructure provides opportunity for flexible delivery and increased breadth of curriculum options, for schools with small student populations. Many schools are developing E-schooling solutions by working in clusters or within their school networks to make coordinated, collaborative plans for the use of technology to support teaching and learning across multiple sites.

Funding to support and grow these initiatives is not secure and the Department continues to pursue all avenues of funding.

Connect

The Department is currently trialling 'Connect', a new online place for school communities, including teachers, students and parents, to interact and engage around teaching and learning. Connect complements and enhances existing face-to-face engagement by providing the flexibility of an online place that can be accessed by the school community anywhere and anytime. Connect allows teachers to extend learning beyond the limitations of the physical classroom. The overall objective of Connect is to engage the entire school community around teaching and learning, and through this engagement, improve student learning outcomes.

Connect is an online place that has been designed around the user experience, with a primary goal of providing online services that are simple to use and that users will be able to easily achieve their teaching and learning goals with minimal training and support.

The Connect trial commenced in 2011 with approximately 20 metropolitan primary and secondary schools and in 2012 the trial is being extended to more schools including selected regional schools. Connect will be evaluated through consultation with teachers, students and parents to ensure that it is meeting their needs, and subject to the outcomes of this evaluation and funding, a further rollout of Connect will be considered.

CASE STUDY 3 – Catholic Education Office (CEO)

Catholic Education WA 2012

The Catholic Education System includes approximately 57 schools outside the Perth Metropolitan area across all four Dioceses in Western Australia. All WA Catholic Schools are connected to the Catholic Education Network VPN (CathEdNet) which provides a best possible WAN connection to each school, and offers central services and support using this state-wide network. The entire system is sustained by a co-responsibility principle where schools are supported by an aggregation model and connections and services are cross subsidised and therefore can be considered comparable between like schools. There still exists a large disparity between the very remote schools, regional schools and the metropolitan schools.

Catholic Education WA is a member of Catholic Network Australia which has enabled upgraded terrestrial connections to many regional and remote schools over the last twelve months. There are now only four very remote schools which remain on legacy Telstra satellite connections in the Kimberley, and these are the schools that are operating on deficient connections to both central and internet based resources. Schools in remote WA are less able to upgrade their services in line with demand, and can incrementally slip further behind their metropolitan counterparts.

The role of the CathEdNet is to provide equitable access to all Catholic students in WA, and as the demand for increased rich content increases, the ability of the System to continue to assist and upgrade the regional and remote schools diminishes when compared to less expensive metropolitan connection rates and charges. Catholic Education WA intends to maintain the equity model for appropriate WAN connections, however the ability for the System to sustain increased disproportionate costs for regional and remote schools to upgrade their connectivity as demand grows presents a growing challenge. This is of high importance to ensure all students in WA are able to access digital resources independent of geographical location.

CHALLENGES FOR REGIONAL AND REMOTE EDUCATION

ICT is potentially a powerful tool for extending educational opportunities particularly for those students located in regional and remote areas. Improving the quality of education and training is a critical issue. ICT can enhance the quality of education in several ways: by increasing learner motivation and engagement by facilitating the acquisition of basic skills, and by enhancing teacher training. ICTs are also transformational tools which, when used appropriately, can promote the shift to a learner-centred environment.

A number of challenges face not only the education sector but the wider community as a whole. However, these challenges are not insurmountable – planning, policy development and a strategic co-ordinated approach is a way forward for regional communities. Key challenges include:

- *Multiple technology* opportunities can be identified within communities but also with the duplication of hardware and expertise not delivering the best results for communities e.g. optic fibre connections to hospitals and schools; separate maintenance costs; lack of expertise and knowledge in terms of maximising usage.

- *Rate of change* – strategic plans are required to effectively manage technological change. The focus on strategies must be beyond the hardware itself to develop digital strategies that ensure maximum integration and impact.

- *Enhancing access* –although difficult to quantify the degree to which technology has helped to access education, there is some evidence that educational opportunities within the higher education sector are available to individuals in regional and remote areas. However, disparities in access between groups such as those located in rural, regional and remote areas, raises various concerns that the use of technology in education will widen the existing divisions in terms of economic, social, cultural, geographic and gender.

- *Raising quality* – many studies support the claim that the use of computers enhances and expands on existing curricula. Research shows (Johnson et al 2010) that the use of computers for instructional delivery, combined with face-to-face instruction (blended learning) results in increases in curriculum learning, basic skills and higher test scores in some subjects compared to traditional instruction alone.

- *Capacity building* – for technology integration to be successful various competencies must be developed for teachers through professional development; educational administrators – must be competent in the use of technology and demonstrate leadership in terms of curriculum, administrative, financial, technical and social dimensions of technology ; technical support specialists are essential to the continued viability of technology use within the school system; content development – traditionally, schools do not employ instructional designers - highly skilled professionals are required to adapt existing content, convert print-based content and develop multi-media courses. The key to using ICT to improve student outcomes is to ensure the teachers have the necessary ability to change their classroom practice to incorporate all that ICT offers. PD must focus on ICT Pedagogy. Teachers need to be provided significant amounts of professional and ongoing support so that ICT becomes part of curriculum offerings providing new ways of learning and analysing and presenting information, and that the technology is not just used as a word processor.

- *Fixed and Recurrent costs* - *s*tudies of the use of computers in classrooms, show that installation of hardware and retrofitting of physical facilities account for 40% to 60% of the full cost of using the computers over their lifetime (retrofitting of physical facilities; hardware and networking; software; and, upgrades and replacement). Annual maintenance and support costs (including professional development; connectivity – internet access and telephone line) constitute between 30% to 50% of the total cost of hardware and software. Much research shows that for every dollar spent on hardware and infrastructure, the equivalent need to be spent on professional development/learning.

The most rapidly rising cost using ICT is that of access to communications technology and internet use. For students to access this medium good speed and bandwidth is essential and for many schools this is not affordable, if it is available in their area.

OPPORTUNITIES

Building on and *resourcing good practice* initiatives. WA is arguably the world's leader in isolated learning delivery. Refer to Appendix 1-3 Case Studies: Beaumaris; Great southern Cluster; Pilbara Education Project).

Governance at a macro and micro level –policy on purchasing; consistency; child safety; inappropriate use of technology; duty of care; ethics; values. It is noted that Independent Public

Schools are moving to greater school based decision making however, non-government schools have always had this protocol. The new program Empowering Local Schools from the Australian Government also has increased school based decision making. The policies must be the owned by the schools to ensure implementation. All schools have different views on what it is appropriate to access and what not and many believe education on good used is much better than blocking sites. Independent schools have always had their own policies on purchasing etc. and on access and usage.

A clear Digital Plan to ensure a macro and micro level investment is required:

- Minimising fragmentation – hard infrastructure; soft infrastructure; effort.
- Articulate clear KPI's; establish monitoring and review processes; identify and manage resource requirements. Non-government schools will always have a plan to get best value for money as funding comes from limited government resources; fees and fund raising.
- KPI's (RREAC perspective – what outcomes are desired):

  - Access to technology and the opportunities it presents;
  - Aspirations – lifelong learners to embrace and benefit from the Digital Economy;
  - Achievement

- Maximise the benefits of a shared approach cross agencies and within communities.

C*ross sectoral collaboration partnerships* – health – education; alliances; shared infrastructure; expertise.

IMPLICATIONS FOR NBN EDUCATION

The first release from NBNCo will be high speed Asymmetric Digital Subscriber Line (ADSL) broadband and telephony, which is aimed at the consumer and small business market which provides high capacity download services and low capacity upload services. ADSL services are ideal for connecting sites where a small number of people are accessing internet and telephone services such as in a home or small business.

The type of services used and required by education jurisdictions is based on symmetrical services, where inbound and outbound services are available at the same capacity. Symmetrical services are required for organisations with large numbers of people, for example staff and students in a school, requiring access to a range of services including internet, video conferencing and access to corporate applications (e.g. Finance, Human Resource/Payroll and reporting systems).

The NBNCo plans for delivering fibre optic services are limited to the Greater Perth metropolitan area, including Mandurah, larger communities in the South West of the state, communities on the Great Eastern Highway and coastal communities as well as major mining communities in the North and North West of Western Australia (See Attachment). Smaller communities with less than 500 homes or business premises will not have access to NBN fibre. Some of the schools in these smaller communities do and will continue to have access to Telstra fibre optic or symmetrical Broadband Digital Subscriber Line (BDSL) services. If the Department was to implement NBN to all schools, it is estimated that at least 120 schools would regress to satellite services.

It is important to note that although NBN will provide new and improved wholesale services and greater wholesale competition for broadband services, the Department is expecting to continue to use existing wholesale services from Telstra, Optus and Amcom for the foreseeable future because most of the Department's current regional broadband services are based on symmetrical broadband and are at similar capacity offered through NBN.

The Department of Education has recently received a request from the Federal Minister of Education. Minister Garrett is seeking information from the Department about the likely connection of schools to the NBN.

The Department has every intention to take advantage of wholesale NBN services, but based on information available from NBNCo this may not happen until Enterprise services are available.

RECOMMENDATIONS

RREAC endorses the Minister's view that technology is not a stand-alone solution for access to and the delivery of education to regional and remote Western Australia. There needs to be a balance between on-line and face-to-face practices to promote the social benefits of interaction. RREAC recommends:

1. That the state government be urged to consolidate government agencies to work together on a Digital Plan to maximise the benefits of technology to all regional and remote communities.

2. The Minister advocates for the effective delivery of the NBN rollout for education services in Western Australia. Current planning and funding does not meet the unique needs of regional and remote Western Australia.

3. That all education sectors in our regional and remote areas have the capacity to ensure that teachers and all school staff have the support and training to utilise technology effectively to maximise student outcomes and to foster professional growth.

4. The Minister supports RREAC continuing to pursue the issue of good practice related to technology within the education sector to provide ongoing feedback to inform the Minister of emerging issues and developments.

5. When the Minister notes technological issues or developments that could impact on education it is referred back to RREAC for further action.

REFERENCES

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