



Connected secondary schools

A paper prepared by the PPTA ICT taskforce

1 Introduction

In 2007, PPTA annual conference discussed a paper that presented a vision for what secondary education should look like in the future. The paper set down a number of principles that would be essential for an effective 21st century education system. The list included the statement that schools of the future will need to be “connected institutions” in “cooperative relationships with regional and national networks of schools... and tertiary institutions/workplaces”. It added: “the capacity of teachers to work effectively across a number of institutions, either virtually or actually will be strengthened”.¹ This paper considers what needs to change to make this hope a reality.

2 Virtual Learning Network (VLN)

The foremost exponent of collaborative learning in New Zealand is the Virtual Learning Network (VLN), a network of some 200 schools and other educational institutions including the Correspondence School. The VLN has evolved from regional experiments with shared ICT delivery into a national network of 19 regionally-based clusters, which provide online subject options for 1200 students. It also has ongoing partnerships with other resource providers, other public and private sector organisations, and online communities across the country.

It says something about the success of this programme that it has grown from five clusters, 400 students and 86 programmes in 2005 to 1410 students, 256 programmes and 20 clusters in 2009. Almost a quarter of the secondary teaching workforce teach in the 123 schools that are connected to an e-learning cluster. The range of subjects offered is becoming increasingly diverse and now includes music (online instrumental tuition), dance, te reo Māori and aviation.² Recently one of the clusters tendered to run a trades academy – demonstrating how flexible and effective the technology has become. While the focus is necessarily on the delivery of senior subjects, the use of the technology is expanding into junior secondary classes through websites such as www.digitalconversations.org.nz, which can be used to bring international expertise into the classroom.

The network is also expanding the range of its activities to encompass professional development, research, professional learning communities, resource development and information sharing. There are very significant savings for isolated schools if they do not have to cover the travel and relief components of professional learning. For teachers, being able to avoid a two or three hour car journey each way is a great boon.

3 The benefits of blended learning

Although the clusters are located in rural areas and grew out of the problem small secondary schools face in providing a reasonable range of subject options for students, the pedagogies that have been developed to serve the VLN have wider application. E-learning encompasses more than simply online teaching because it uses the full range of information and communications technologies (ICT). The distinction between e-learning courses, delivered



over a distance, and face-to-face courses that incorporate the internet either as a teaching tool or as part of the administration of homework and assignments is more apparent than real. Increasingly, educational institutions regardless of their size or location are making use of “blended learning”, which integrates a range of ICT with the traditional elements of face-to-face teaching. There are significant benefits to this approach:

- It provides a broad curriculum including tertiary options.
- It is highly interactive, in contrast with traditional distance learning options (and with some traditional teaching approaches).
- It is flexible. Students manage their own time and can review lessons and access them asynchronously should they need to. And teachers can deliver their lessons from any location.
- It facilitates personalised learning, as students can design their own programmes and manage them to suit.
- It may increase student participation, particularly for less confident students who may prefer online discussion forums.
- It encourages self-directed learning.
- Students gain access to specialist expertise (including teachers at other schools or tertiary institutions).
- It encourages greater involvement from parents.
- The potential for professional learning and collaboration among teachers is increased.
- Small, isolated schools are able to retain senior subjects and thus the specialist teachers that teach them.
- Rural communities are strengthened, because teachers and students who might be forced to move elsewhere in order to deliver or enrol for specialist courses can do so without leaving home.
- It overcomes timetable clashes that prevent students from doing some subjects.

4 If it’s so good, why isn’t there more of it?

In spite of the clear advantages for learning, effective ICT practices in New Zealand schools have come about more by accident than design. A few visionaries, sometimes in schools and sometimes not, have kept the project moving forward even in times when interest, support and funding were lacking.

4.1 Missed opportunities

New Zealand almost missed the digital revolution, because it coincided with the implementation of Tomorrow’s Schools. The administrative challenges presented by devolution and the ongoing battles over power and funding in the new structure distracted attention from the central issue of teaching and learning and the important question of how ICT could contribute



to that process. Moreover, since one of the goals of the Tomorrow's Schools reforms was to eliminate any influence teachers might have on the direction of schooling, the professional and curriculum bodies that might have otherwise driven a national ICT agenda were effectively sidelined.

As a result it was not until 1998, almost 10 years after the introduction of Tomorrow's Schools, that some funding was added to schools' operations grants for ICT. Most of that was for the provision of a limited programme of ICT professional development for teachers. Before then, all ICT equipment in schools had been paid for by fundraising through events like net days, when teachers and parents turned up at school in the weekend to dig trenches for cabling. Unfortunately, enthusiasm isn't always a satisfactory substitute for expertise and the result was often poor-quality school networks, which combined with too few computers and inadequate technical support to discourage teachers from experimenting with ICT in the classroom.

4.2 The Correspondence School and ICT leadership

Another casualty of Tomorrow's Schools was The Correspondence School, which was bulk funded from 1990. This meant that it was starved of funds and did not have the capacity to play the leading role in the digital revolution that was adopted by similar institutions in most other countries. For most of this period the other organisation that might have been expected to show leadership, the Ministry of Education, was a "policy only" organisation.

4.3 Casatech

In spite of the arid environment, some flowers did bloom. In 1995, seven secondary schools formed Casatech (now Cantatech) with The Correspondence School. It was the forerunner of the VLN, and began online delivery initially by using computerised audiographic technology and later moving to video-conferencing.³ This initiative was picked up by other schools, and clusters developed throughout the country.

5 The 21st century

The change of government in 2000 foreshadowed some weakening of the ideological position that imagined every school as an island capable of making and funding its own decisions about ICT. This more pragmatic approach led to the implementation of a number of centrally-driven initiatives:

5.1 Project PROBE 2002–05

The government's aim in this \$38 million project was to ensure that rural schools had access to broadband internet. Although it struck some problems, including a lack of support from Telecom, it was successful in expanding rural schools' access to broadband (almost 900 schools) and partly explains the rapid take-up of the VLN after 2003.

5.2 The rollout of laptops for teachers and principals

The 2002 Budget provided funding for the rollout of laptops to teachers, a programme that continues today. While the 2008 review of the scheme notes that the changes ushered in by the laptop scheme are "evolutionary rather than transformative", this is not intended



as a criticism.⁴ The laptop scheme succeeded in enabling teachers to become familiar with the technology at a personal level, a necessary precursor to applying it creatively in the classroom. The report also makes clear that the full benefit of the laptop scheme depends on schools having the capacity to provide the infrastructure: technical support, reliable broadband, wireless connections, other peripherals and software, remote access, and professional development and leadership within a collaborative and supportive culture. A further constraint on the expansion of ICT is the extent to which students can access computers and the internet in all classrooms and at home.

5.3 ICT professional development

The laptop programme was accompanied by an ICT professional development programme. The evaluation suggests this was generally successful,⁵ though less so for secondary teachers than primary teachers, possibly because of the diversity of needs among secondary teachers (although the report acknowledges that secondary teachers usually had a higher level of skill on joining the programme) and because secondary schools have been less inclined to work in clusters.⁶

5.4 Central purchasing

One of the most sensible outcomes from the return to more pragmatic policies around Tomorrow's Schools was the savings that accrued through central purchasing of software, software licences, virus protection and hardware such as data projectors. Progress in this area had been stopped by a vocal minority demanding the right, as "self-managing schools", to go their own way without consideration of sensible cost savings or possible interoperability problems.

The Ministry of Education also funds the operation of the video-conferencing bridge, which schools use to connect to other schools.

5.5 Network upgrades

As broadband became more widely available, it became apparent that in many schools the internal networks were substandard – and even though a board of trustees might have spent considerable sums on cabling, it all had to be replaced.⁷ From 2005, a subsidised network upgrade programme was initiated, targeted at small primary schools. The scheme has since been expanded so small secondary schools can upgrade their networks. Those schools that had invested considerable sums to build robust networks were not particularly impressed to learn that other schools were now receiving subsidised upgrades, but such unevenness is an inherent feature of devolution.⁸

5.6 Loops

In 2005, the government invested \$24 million in the MUSH (municipalities, universities, schools, hospitals) network, which was designed to allow a non-profit organisation (as opposed to the telcos) to become the hub of a fibre network with the ability to on-sell capacity on its network for commercial use. It also set up KAREN (Kiwi Advanced Research and Education Network) consisting of universities and a number of Crown research institutes.⁹ This is a high-speed network that, as well as joining New Zealand institutions, is also linked



to Australia and the United States.¹⁰ Regional initiatives have resulted in schools being connected to high-speed fibre loops in Nelson, the North Shore and Wellington, meaning they can link to MUSH networks and to KAREN.

5.7 Broadband (better late than never)

New Zealand's record in broadband infrastructure is woeful, largely because the privatising of our telecommunications network in 1986 left governments without any influence in the area until 20 years later when Telecom was legislatively restructured.¹¹ This year the National government announced a \$1.5 billion investment in broadband, including \$34 million for schools and special funding provision for rural areas.

6 And the bad news...

As well as the good news stories, problems persist – most are associated with the complexities of a devolved system. Effective ICT use in schools requires appropriate leadership, and in the Tomorrow's Schools framework this tends to mean school leadership, conveniently exempting politicians and ministries. In spite of the progress made with central purchasing there are still a number of unsatisfactory areas where leadership and direction have been lacking, leaving schools carrying the can.

6.1 Student management systems (SMS) and learning management systems (LMS)

The experience of purchasing student management and learning management systems has been uncomfortable for many schools. In the absence of any central direction they purchased unsuitable systems that, as well as being a waste of money, squandered teachers' time because activities like report writing could not be done efficiently. Subsequently, the ministry developed an accreditation system that identified approved products, but it did this on the basis of business-type requirements rather than the quality or functionality that schools require. There were problems with approved products: one was so inadequate it had to be withdrawn from the market; others have brought schools to a standstill as a result of lost data; and currently there are problems with one SMS providing a facility to assess the curriculum key competencies which is at complete odds with agreed assessment policies.

6.2 Copyright

The more that schools use ICT, the more expensive copyright licensing becomes. Once again, though, the devolved schools system leaves all schools individually carrying both the cost of licensing and the legal risk of breach. In other countries, it is possible to negotiate national copyright licensing. In New Zealand the one organisation that might be thought to have an interest in negotiating a national deal for boards of trustees, the School Trustees Association, instead profits from the situation by brokering licences.¹² It would be better for schools if central agencies took responsibility for expanding the creative commons approach, which involves organisations deliberately making their materials freely available online.¹³ In the interim, central agencies should negotiate nationally-applicable copyright licences.

6.3 Laptops

Under the laptop scheme, the computers are leased, and the Ministry of Education pays two-thirds of the cost and either the board or the teacher pays the rest. In some schools



the board of trustees pays, in others the teacher pays around \$250 per year. While this amount may appear insignificant, access to a laptop has now become a basic requirement of teachers' jobs. So it is neither fair nor consistent that some teachers should have to continue to pay. As there can be problems with teachers connecting personal computers to the school network, school provision of equipment is essential.

6.4 The digital divide

The integration of ICT into schools' practices carries with it the implication that students will have access to computers and the internet both at school and at home. Students whose total use of ICT occurs only at school cannot be expected to match the confidence, capacity and, eventually, achievement of their more fortunate peers.

A recent report has suggested that as many as 100,000 school students do not have access to a computer at home.¹⁴ The Ministry of Education needs to take responsibility for the development of a plan for equipping disadvantaged students with appropriate hardware and software. This would require close consultation with appropriate schools because there will be follow-on challenges for school infrastructure in respect of work stations and classrooms, power and outlets, and possibly wireless networks. Catch-up computing classes for some students may also be required.

There is also a role for business and community groups to assist in addressing this inequality.

6.5 Technical support

Schools have struggled to get adequate, centrally-funded technical support, which is a requirement for effective ICT implementation. A help desk was established in 2002 as a cheaper alternative to the on-the-ground help that schools really wanted. The Ministry of Education has organised a series of national roadshows to upskill technical staff. It goes without saying that schools have never been funded in their operations grant for the cost of employing technicians, and this can be expensive given the skills shortages in this area. It is also important to note that the demands schools make on their equipment far exceed anything that a similar-sized business might make: in a school, for example, there may be up to 1600 logons and logoffs per hour.

6.6 Health and safety

Health and safety concerns in respect of computer users – both for teachers and for students – have fallen into the black hole that also exists between schools and the centre with respect to property concerns. In the rush to purchase hardware and software, schools found themselves without suitable spaces to house them and without funding to set them up safely. Consequently, school computers are often used in unsuitable spaces that lack ventilation, appropriate lighting or ergonomic furniture. As well as reducing the life of the components, such conditions present a significant health hazard for teachers, who must spend up to five hours a day in rooms containing as many as 30 computers.



6.7 Power

Another black hole for schools is electricity. As ICT use increases in schools, the demands on electricity are such that local transformers are being overloaded – and in some cases even exploding. The expectation from privatised power companies is that schools will pay up to \$150,000 to upgrade the local supply infrastructure. Schools are also stuck with the costs for rewiring blocks that were designed to accommodate the minimal electrical use required in the 1950s and 1960s. This level of expense is simply not affordable for schools and the Government will have to grapple with this issue sooner or later.

6.8 Teacher workload

Teachers have, in general, embraced the potential of ICT in education, and none more so than the teachers in the VLN. The enthusiasm of those teachers who have pioneered the new ways of teaching will be undermined if their workload concerns remain unaddressed. In a 2003 conference paper, PPTA established the principle that teachers should receive three hours non-contact for every one hour of online teaching, a formula that recognises the increased intensity of an online class as opposed to a face-to-face lesson.¹⁵ PPTA claimed for this in bargaining for the Secondary Teachers' Collective Agreement in 2004 and again in 2007, but without success. There has however, been some success with the second principle established by the 2003 conference, that teachers required to teach online outside the school day receive compensation. The collective agreement now establishes that teachers' class contact time may not exceed 20 hours for a full-time teacher.

The other area where there has been an absence of success has been the 2003 conference recommendation that schools be provided with an additional 0.2 staffing to go towards technical support. The intention of this proposal was not just to assist schools in establishing and maintaining effective networks but also to lift the burden on teachers – usually computing teachers – who provide free technical support in many schools.

PPTA also made bargaining claims in 2004 and 2007 for the establishment of "e-learning positions" in schools along the lines of the specialist classroom teacher (SCT) positions. These would be positions for teachers with a continued teaching load, but with an extra time allowance (0.2) for leadership of ICT in the school. The actual form the position might take would be up to schools to determine. It might, for example, be a teacher librarian position or it might assume a more specific e-learning pedagogical support role. Small schools could combine their 0.2 of staffing to create a full-time position which they would share. The only progress made with this innovation has been the capacity in area schools to use the SCT position in this way. Area schools are still exploring the possibilities of this position, although Roxburgh Area School is experimenting with an "Mteacher" (a mentor teacher), whose role is to actively support the engagement and learning processes of students who are engaged in online learning.¹⁶

7 A connected future?

In the future, cloud computing¹⁷ and increased use of open source software may eliminate some of the difficulties and costs schools presently struggle with. Governance arrangements, however, will remain a significant barrier to connectedness in New Zealand schools. Secondary



school teachers are employees of the approximately 480 secondary and area school boards of trustees established in 1989. This can present problems when, either virtually or actually, staff work in schools where they are not employed.

The VLN clusters get around this difficulty in various ways. They may ask schools to contribute one subject in return for receiving other subjects. If a school cannot contribute any subjects, it may contribute 0.2 staffing or the cash equivalent. The governing principle is reciprocity. As the VLN continues to grow in size and complexity, these informal arrangements that rely on goodwill may not be enough.

In 2005, the clusters themselves began calling on the Ministry of Education to develop a funding model that took better account of e-learning.¹⁸ PPTA also assisted with the lobbying for a better formula. While there was no progress in developing a new funding model, in 2008 the then minister of education Steve Maharey provided \$1 million to support central brokering of the clusters and the employment of 14 e-principals to provide local brokerage and pedagogical leadership. Unfortunately the funding ran out in June this year and the government has determined not to renew it. This has left the clusters scratching around to find sources of money or seeking staffing contributions from the cluster schools. If they can't, incredibly, the clusters may collapse.

The role of the e-principals in providing leadership and coordination both within regional clusters and at a national level to manage the "community of communities" cannot be overstated. The ministry assumption that schools will somehow find the resourcing to continue the positions is unrealistic and short-sighted. Networking between schools is considered to be a vital element of 21st century education, yet the genuinely indigenous example of connected schools, the VLN, is not being supported.

The VLN is not the only group of secondary schools struggling to find ways of funding and staffing shared activities. Other mechanisms used include: the Itinerant Teachers of Music (ITMS) who are all employed by a nominated host or base school but work in a number of schools; Resource Teachers Learning and Behaviour (RTLBs) who are employed by a nominal host school while the management functions are carried out by the RTLB cluster group; and technicraft teachers for year 7-8 students who are employed by a particular school but teach students from a number of other schools. A memorandum of understanding is drawn up to authorise the transfer of parts of staffing from the client school to the host school. All of these represent somewhat clumsy attempts to overcome the barriers that the outdated and bureaucratic Tomorrow's Schools governance and employment structures place in the way of collaborative initiatives.

Since connectedness between schools is likely to increase rather than decrease, a solution needs to be found to this problem. PPTA has approached the ministry on a number of occasions seeking a forum in which to explore this issue further, but there has been only mild interest, perhaps because it represents a direct challenge to the ideology of Tomorrow's Schools. In fact, the future lies neither with the atomised Tomorrow's Schools model nor with the inflexible regional model that preceded it.

Building a cyber future isn't just about buying more hardware and software; it is also necessary to think differently about the way we do things. But the Ministry of Education's 'Review



of Schools' Operational Funding: ICT Resourcing Framework' illustrates this reluctance to consider a different future. The report identifies "differences in the quality of ICT across the sector" and acknowledges that "the management of ICT is an issue for some schools". But it appears to take no account of the unevenness in ICT capacity; instead, it establishes a guiding principle for the framework that "schools are, in the first instance, best placed to make resource allocation decisions in regard to their ICT needs".¹⁹ It is difficult to see how that conclusion could emerge from any consideration of the evolution of ICT use in schools. It is equally difficult to imagine how a connected digital future can emerge from an unequal and disjointed schools system.

8 Conclusion

Despite wrong turns and a few disasters, secondary schools have cut a path to the digital frontier. The next challenge is to build learning communities in this new world. This will not be achieved by a continuation of the hit and miss approach that has characterised ICT integration in New Zealand schools up till now.

Recommendations

- 1 That the report be received.
- 2 That this conference call on the Ministry of Education to undertake a consultative review of funding and staffing to better support collaborative practices in secondary schools.
- 3 That this conference urge the government to recognise the innovative work of the VLN by restoring funding for e-learning principals.
- 4 That this conference support continued central purchasing of software and selected hardware (switches and routers) for schools by the Ministry of Education.
- 5 That this conference urge the Ministry of Education to extend its present range of central purchasing to include copyright licences.
- 6 That PPTA develop a campaign to encourage all secondary school boards to pay for teacher laptops.
- 7 That this conference call on the Ministry of Education to develop a plan to ensure that all students have access to appropriate hardware and software at home and at school.

Endnotes

1. PPTA. *Secondary teaching into the future*. Annual Conference Paper 2007. p9. Retrieved 4 August 2009 from http://www.ppta.org.nz/index.php/resources/publications/doc_download/446-secondary-teaching-into-the-future.
2. Che Baker. 'Catlins planning NZ's first virtual trades academy'. Southland Times. Retrieved 4 August 2009 from <http://www.stuff.co.nz/national/education/2547752/Catlins-planning-NZs-first-virtual-trades-academy>.
3. Credit for the establishment and expansion of Cantatech has to be given to the principal of Oxford Area School, Carol Moffatt who later became ICT Manager in the Ministry of Education.



4. B Cowie, A Jones, A Harlow, C McGee, B Cooper, M Forret, T Miller & B Gardiner. 'TELA: Laptops for Teachers Evaluation – Final Report Years 9-13'. June 2008. Retrieved 4 August 2009 from www.educationcounts.govt.nz/publications/ict/27370/24604/9.
5. The various reports can be found at 'Information and Communication Technologies Professional Development (ICTPD) School Clusters Programme', retrieved 4 August 2009 from <http://www.educationcounts.govt.nz/publications/ict/5819>.
6. This is partly explained by size (big schools have no need to augment their numbers) and the fact that a more competitive climate exists in the secondary sector.
7. Reportedly at least one school has lost \$300,000 as a result of having to replace an inadequate network.
8. Contrast this with the speed with which Scotland has been able to cable schools. Managed by Learning and Teaching Scotland and delivered by Research Machines (RM), Glow is the world's first national intranet for education. It digitally links Scotland's 800,000 educators and pupils. There will be an individual email address for every teacher in Scotland and a virtual learning environment (VLE). Every pupil will have a homepage and an email address, chatrooms will be developed for each subject, classes will be available in the form of video conferencing, teachers can access lesson plans, homework can be submitted directly for marking, and parents can talk to teachers by email. See: www.ltscotland.org.uk/glowscotland.
9. See: <http://www.karen.net.nz/about-reannz/>.
10. For the outcomes of the KAREN/school trial delivering the National Education Network (NEN), see: <http://www.karen.net.nz/assets/Uploads/Publications/NENLearning-Challenge-Report.pdf>.
11. Telecom New Zealand was created as a state-owned enterprise when the Post Office was dismembered in 1986. The government turned it into a profitable business by removing its social obligations and absorbing the costs of staff cuts and new technology. It was sold a consortium led by Bell Atlantic and Ameritech in 1990. Six years later their combined net investment of \$1.15 billion for a 49.5% share was worth \$7 billion at the current market price. A further buy-back of shares by the company, announced in late 1996, meant they had recovered 85 percent of their original investment. In addition, Telecom regularly took around 70%, and in 1994 some 90%, of its profit as dividend. At the end of 1998, Bell Atlantic and Ameritech announced they were selling all their shares and moving on to new pastures. See: <http://canterbury.cyberplace.org.nz/community/CAFCA/publications/Electricity/Privatisation.doc>.
12. School Trustees Association. 'One Stop Shop' Copyright Licensing Scheme'. 2006. Retrieved 4 August 2009 from <http://www.nzsta.org.nz/rexdefault.aspx?PageID=0eab7184-7a2f-4224-9e42-4980546bc61f>.
13. Creative Commons aims to establish a fair middle way between the extremes of copyright control and the uncontrolled uses of intellectual property. It provides a range of copyright licences, freely available to the public, which allow those creating intellectual



property – including authors, artists, educators and scientists – to mark their work with the freedoms they want it to carry. See: <http://www.creativecommons.org.nz/>.

14. One News. *'Kiwi kids miss out but more seniors are online'*. TVNZ. 27 July 2009. Retrieved 4 August 2009 from <http://tvnz.co.nz/technology-news/kiwi-kids-miss-but-more-seniors-online-2875126>.

15. Non-contact time is not a very accurate title to describe the fluid nature of student contact mediated by asynchronous technologies.

16. K Pullar & C Brennan. *"Personalising learning" for secondary students working in a blended (distance/'f2f'/vocational) learning environment'*. *Computers in New Zealand Schools*, 20(2).

17. "Cloud computing is a style of computing in which dynamically scalable and often virtualized resources are provided as a service over the Internet. Users need not have knowledge of, expertise in, or control over the technology infrastructure in the 'cloud' that supports them." Retrieved 4 August 2009 from Wikipedia: http://en.wikipedia.org/wiki/Cloud_computing.

18. R Browning. *Virtual Education Network (VLN) Report on eLearning communities*. 2005.

19. Ministry of Education. *'Review of Schools' Operational Funding: ICT Resourcing Framework – Final Report'*. 2008. Retrieved 4 August 2009 from <http://www.minedu.govt.nz/educationSectors/Schools/Initiatives/ICTInSchools/ReviewOfSchoolsOperationalFunding.aspx>.

Decisions from the 2009 Annual Conference



Connected Secondary Schools

1. That the report be received; and
2. That PPTA call on the Ministry of Education to undertake a consultative review of funding, staffing and IT support to better support collaborative practices in secondary schools; and
3. That PPTA urge the government to recognise the innovative work of the Virtual Learning Network (VLN) by restoring funding for e-learning principals; and
4. That PPTA urge the Ministry of Education to extend its present range of central purchasing to include multimedia copyright licenses; and
5. That PPTA develop a campaign that places the expectation on all secondary school boards to pay for teacher laptops; and
6. That PPTA develop a Code of Practice and safe working practices for the use of digital technologies.
7. That PPTA support central purchasing and funding of a range of software and hardware for schools by the Ministry of Education.
8. That PPTA call on the Ministry of Education to develop a plan to ensure that all students have access to appropriate hardware and software in their communities and/or homes.
9. That PPTA urges the Ministry of Education to fund secondary and area schools for appropriate full-time digital technology support.