Premier’s Teachers Mutual Bank New and Emerging Technologies Scholarship

Fostering Student Success through Development of Connected Learning Communities

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In schools across New South Wales, planning is on the way to meet the needs of the 21st Century Learner. Often the solution used by schools is the bulk purchase of technology assets for classroom-based delivery of lesson material and increasingly tablet and iPad devices for use in small groups. An increasing body of evidence suggests that this model only addresses one of many aspects of the 21st Century Learner. The students’ needs are constantly changing with the demands of society and tertiary education; therefore, K–12 environments need to address the need to build the capacity of students to learn in multiple environments, both conventional and open sourced.

The New South Wales Department of Education and Communities released the Great Teaching, Inspired Learning and the Rural and Remote Blueprint for Action during 2013. These documents articulate clear pathways for schools to work together for the benefit of both staff and students across educational settings. Over the past 25 years several programs such as Access, Xsel and Distance Education have been initiated in rural and remote settings that provide avenues for students to access a core or extended curriculum. In 2015, these programs will be supplemented with the new Virtual Selective High School as part of the Rural and Remote Blueprint. Many lessons learnt from implementing and operating these programs can be used to improve the partnerships, curriculum extension and connectedness in learning across all schools in NSW.

My research tour is based on investigating the employment of emerging technologies in K–12 education. I visited various connected learning communities and universities in New Zealand, Western Australia, Tasmania and New South Wales where I met exemplary educators applying innovation in many areas of technology in education.

During my research I concentrated on three focus areas:

* 1. **connectedness** between schools to develop avenues for both curriculum delivery K–12 and for staff development through Communities of Practice/Learning
  2. **leadership capacities** required to lead and improve schools in employing 21st century pedagogies
  3. **opportunities for universities** to link with schools as primary professional learning providers as we move towards a local schools, local decision paradigm.

Throughout the research tour, and in pre and post tour sessions with educators, two common underlying concepts were evident: the sense of community and purpose between schools involved in learning networks, and the coevolution of pedagogy and technology which are effective when developed in parallel.

“… by the interactions between the evolution of education; both education and digital technologies are evolving and so changes in one tend to stimulate the changes in the other …”

Davis, 2013

This coevolution was evident to varying degrees across all sites visited. Previously in NSW, all public school were provided with Connected Classroom technology, promoting connectedness between schools and external education providers. Increasing the awareness of this technology and the associated pedagogy will promote even more opportunities for schools to network and advance the use of emerging technology in schools.

Education sessions with the University of Canterbury (UoC), Charles Sturt University (CSU), Edith Cowan University (ECU), University of Tasmania (UTAS) and the University of Newcastle (UoN) confirmed these ideas and linked the importance of the three research focus areas to existing and future educational networks in NSW: development of community, effective leadership within these communities and links to current and effective professional learning for both leaders and educational practitioners.

Connectivism between schools to develop avenues for both curriculum delivery K–12 and for staff development through Communities of Learning

Connectivism describes learning that is fostered through social connections. Current connected learning community provisions in NSW, such as Access, Xsel and Distance Education, rely heavily on centralised systems and school-based hardware assets. While these models have fostered a significant development of innovative pedagogies since 1989, they also require significant resources in terms of staffing and operational funds.

The future of schools, in terms of Local Schools, Local Decisions, necessitates new thinking as to how the current levels of funding can be used to support an increasing number of schools from similar contexts. Connection between schools was necessitated by the critical need for local schools in small communities being able to offer a senior curriculum to retain their students through to Year 12.

The New Zealand Experience

New Zealand was a critical system to visit due to a countrywide education reform referred to as Tomorrow Schools. New Zealand schools have been autonomous since 1989, similar to the Local Schools, Local Decisions being implemented currently in NSW. New Zealand implemented a National Curriculum across all schools and sectors in 1993. These two pertinent parallels to current reforms in NSW offer lessons in implementing technology into our classrooms.

I concentrated on visiting school-based connected learning communities and the way in which they have formed connections between schools through technology and cluster wide planning. This included two distinct models, NetNZ, based at Roxburgh Area School (equivalent to the NSW Central School structure), and FarNET, based at KeriKeri High School.

The model used in both clusters was a familiar school-based connected community model, with staff from schools delivering courses through technology as part of their teaching allocation in their local school. The differences were in the future planning that both clusters have embarked on. NetNZ has expanded and combined several clusters into one large cluster of over 50 schools, predominantly on the South Island. FarNET has been increasingly used to foster leadership and peer professional learning for new clusters of schools to be established on the North Island. As a further strength all clusters work together at an educational leader level to build positive working relationships between schools and the associated universities.

Both school principals and the cluster ePrincipals and executive emphasised the establishment of a sense of community between the schools. The nature of the connections was reciprocal in that all school leaders saw that their schools’ involvement, regardless of the level, was critical for their students’ opportunities to access a wide and professionally delivered curriculum. Some schools had several staff involved as course facilitators, while some were just starting their involvement with student enrolments. There is an expectation from school leaders that all schools are equal in standing in the clusters and that the role of the ePrincipal is to negotiate and support the leaders and schools.

This collaborative model has resulted in innovations in pedagogy and the use of technology across many areas of curriculum development and delivery K–12. Virtual faculties have evolved which provide further support for staff, both currently delivering and those wishing to develop their capacity for delivery in their respective subjects. Incentivising staff involvement through professional learning has lead to a high degree of job satisfaction and engagement across all clusters reviewed in New Zealand.

The school clusters I visited use a blended model of videoconference and web-based solution suites that allows for flexibility and scalability to suit student and cluster needs. OtagoNet and CantaNet, combined now as NetNZ, and FarNET use a wide variety of web-based resources such as:

* + Facebook—for delivery of material and collection of student interactions
  + Google Hangouts—to promote group interactions between students
  + Google Apps—for online free productivity applications that are essential for Bring Your Own Device (BYOD) use
  + Edmodo—for a structured online learning management environment
  + Skype—for immediate staff/student facilitator feedback
  + Polycom Real Presence—for mobile device access to video conference sessions.

These online solutions promoted a strong sense of positive digital citizenship, with negligible issues with inappropriate use of technology. Student and staff have unlimited access to wireless connectivity in all schools, which is further enhanced through the Ultra Fast Broadband provision to schools. The connection with wireless access increased the success of BYOD implementation and the use of innovative classroom practices using interactive technologies in primary classes.

CORE Education

[The Virtual Learning Network](http://www.vln.school.nz/) (VLN) hosted by [CORE Education](http://www.core-ed.org) is a true innovation of education technology and connectivity. The VLN allows students from all schools, regardless of sector, to enrol and engage in senior curriculum through a brokerage portal, providing students with a wider range of options for senior study. It also promoted staff engagement in connected learning, increasing their capacity to deliver to a wider range of students.

Core Education provides free access to a wide variety of professional learning avenues for staff across all sectors in the areas of 21st Century Pedagogy and the use of technology across all areas of education K–12. All professional learning is mapped back to the National Curriculum as a common language between schools.

My discussions with Derek Wenmoth, Director of CORE Education, was based on the aspects of the 21st Century Learner. Ten trends are identified and unpacked through CORE Education; one of the critical ones was Learner Agency. As a way to inform school planning, 21st century learners will engage:

* + ***With*** technology—web 2.0 applications, National Curriculum, BYOD
  + ***Through*** technology—VLN, Blended learning, online engagement
  + ***About*** technology—programming skills, digital literacies.

New Zealand schools are also now beginning to employ Modern Learning Environments (MLEs) in school settings. These break down the conventional classroom norms of rows of desks facing the teacher awaiting instruction to a more group-based, peer engaged model. An MLE also promotes the teacher as the facilitator and provider of access to learning, not the sole expert in the room. I visited several MLE facilities, from the library facility at Charles Sturt University in Bathurst and senior study facilities across schools in New Zealand. I also discussed the role of an MLE as a function of teacher instruction for undergraduate studies with Edith Cowan University where they are using MLE aspects to allow student teachers to view classes in real time through video links. This area will be of significant importance in NSW as we move towards a more connected future between schools and global learning.

The Tasmanian Experience

The Tasmanian eSchool model is similar to the current Distance Education provision used across NSW. As a school they provide curriculum for students who do not have success in formal school settings or have significant health issues. They also provide up-to-date professional learning access for staff from comprehensive high schools and primary schools for using the state-wide technology solutions.

Tasmania has employed two innovative platforms that meet several needs across schools and government sectors:

* + **Microsoft Lync** enables access to full video conference facilities on any PC throughout the schools. Similar to Skype or Adobe Connect, it provides full audio/visual connectivity with document sharing and editing between conference participants. A powerful aspect is that it links all government areas.
  + **Pearson Fronter** was used as a school-based solution for lesson delivery and engagement across many sites I visited. The strength in this solution is that the Tasmanian eSchool has been preparing template-based modules for use across all schools, which has lead directly to increased teaching input into how the content is delivered and reduced time spent on setup by teaching staff.

The move from Moodle to this system has also allowed for an easier transition to a blended model for staff to engage a variety of learners. Some models involve the traditional paper-based workbooks, while increasingly, staff are moving towards using Pearson Fronter with other platforms such as Collaborate Blackboard or Adobe Connect.

I also visited Taroona High School, a comprehensive high school with an affluent drawing area and high levels of student success and engagement. The school implemented a BYOD policy over the last 10 years, with the onus on the students to ensure that their technology tools are ready and working for every lesson. There is a strong focus on effective use of technology by all staff, which is also carried over into the classroom environment, as the school is moving towards setting up MLE style areas for classes. The successful implementation of new processes and emerging technology is tied explicitly to the focus and vision of school leadership. Where changes have been made efficiently, there has been clear directions and mapped professional learning lead by the principal and school executive. Providing effective staff professional learning was seen as essential for success for new scheme teachers and teachers new to using ICT in their classrooms.

The use of ICT is normalised as part of the school culture. The use of scaffolds and processes in schools, along with Fronter templates, promotes more engagement from staff in curriculum development. This was critical in the success of BYOD as it provided consistency across so many levels of the schools from wireless access in all areas to non-platform specific content delivery in class.

Taroona Primary School, neighbouring the high school, also has implemented a strong staff focus on using technology effectively classrooms. One of the significant learning’s from this visit was the flexibility of Pearson Fronter in allowing staff across multiple schools to create and share curriculum. Fronter has also been used to foster online collaboration between staff across schools and sectors. Class pages are used to showcase student work to the parent groups, with parent access and feedback an important part of the ongoing development of the system. All teaching and learning programs, based on the full National Curriculum, are linked to the Fronter system, so as staff move between schools they can always have access to the curriculum they have developed.

Overall the focus from the teachers and schools visited in Tasmania is on the continual improvement and development of engaging students through using simple and scalable technology solutions. The focus of technology planning in schools has moved away from determining what hardware to purchase for the school to looking at the pedagogical needs of the students and finding the ways to match the ICT solutions to them.

Leadership capacities required to lead and improve schools  
 in employing 21st century pedagogies

Leadership is a critical component of the success of implementing emerging technologies in any educational setting. The [Australian Institute for Teaching and School Leadership](http://www.aitsl.edu.au/) (AITSL) sets standards for teachers and school leaders to guide the aspects of their roles in each school. The National Curriculum in NSW integrates the use of ICT across all areas, promoting staff to use ICT to engage students as 21st century learners.

From discussions with school leaders, university lecturers and teaching staff, one of the salient points was the implementation of ICT with a clear purpose to addressing student needs. Purpose is how technology and associated pedagogy can be employed and how it is supported to benefit both teaching and learning.

There is an increasing onus on school leaders to ensure that they are aware and involved in implementing ICT in their schools. The success of this was seen in both schools clusters across New Zealand and in the Tasmanian eSchool. Some of the best results were from schools that have adopted the Modern Learning Environment processes in schools, allowing for more flexible student access to learning, either online or face-to-face.

The capacities don’t just rely on the use of ICT but also on developing an ethos in schools to accept and manage change. NSW is currently undergoing various reforms and implementing a new curriculum, providing many challenges for school leaders to manage these aspects and then provide support for ICT use. A key aspect identified by many of the leaders interviewed is the use of distributed leadership amongst staff, which involves a high degree of trust in staff and their abilities. A robust TARS/EARS style of accountability is also required so that all roles and requirements are understood and met.

A great example of this new level of whole staff accountability was seen at Roxburgh Area School where all staff provides a fully referenced piece of research in any aspect of their teaching for the Board of Trustees to review. In some contexts this may seem confronting, but the improvement in staff engagement in their organisation and currency in their ongoing professional development was measurable and positive.

Another aspect of leadership that was identified was the capacity for school leaders to form networks of practice between schools for staff and their own professional development. This model has been used in NSW for some years as Virtual Faculties or Communities of Practice. These models are used across both New Zealand and Tasmania and with strong leadership have been successful and sustainable. For schools to be successful as connected learning communities they must have a common shared goal and belief in their involvement in the whole group. In an autonomous school model, leaders need to be able to facilitate networks to broaden curriculum and support professional development of staff.

Opportunities for universities to link with schools   
as primary professional learning providers

As we move towards a local schools, local decision paradigm, universities are the richest source of current research in all areas of education and school leadership. Their involvement in schools is critical for the long-term progression of the teaching craft and to support effective change. I toured various universities in New Zealand and Australia to investigate ways universities can be further involved in schools as a real time avenue for current research and professional learning for staff and school leaders.

Charles Sturt University has 22,000 students studying online. More than half of these are professionals upgrading qualifications or workers changing careers. The university has significant expertise in supporting and engaging learners through a range of virtual and face-to-face activities. The quality of the online teaching and learning and support systems particularly suit learners in rural and remote communities. They are currently trialling Massive Open Online Courses (MOOCS) and Badges as an adjunct to their high quality and well supported teaching and learning models.

Teacher driven professional learning that contributes to postgraduate qualification such as a Master of Education is an exciting avenue being developed currently at CSU. This can be a strong incentive for educators to be involved in ongoing professional development and have their classwork and whole school involvement count towards case studies and linked to current methodologies and research.

An emerging aspect of teaching degrees is the need for Digital Literacy amongst teachers heading into schools. The use of social media as a teaching tools is increasingly being developed to not only deliver courses cost effectively, but also to build the concepts and responsibilities within the learners so that they can use this as a guide in their teaching. It has been proven that early adoption of ICT by students in infants and primary schools promotes more successful digital citizenship and more confidence in using the Internet as an independent research tool.

Employing university supported Professional Learning Networks based on staff needs that can be used meet the emerging needs of schools and groups of schools is of increasing benefit to NSW schools. Using interactive technology can make this process more accessible and can even be linked to universities assisting staff live in classrooms. Under Great Teaching, Inspired Learning this process can also strengthen community partnerships by involving parents to help them understand current school practices.

The University of Newcastle has been a leader in evaluating ICT in education. The university published a report on Innovative Teaching and Learning (ITL) that is specifically linked to the emerging technology used in schools and how staff are professionally developed to employ new technology in their planning and lesson delivery.

Some of the outcomes published included barriers to effectively using ICT in education. These include:

* + not enough computers for student use
  + not enough time to plan for ICT integration
  + not enough professional development
  + inconsistent access to Internet or video-based resources.

Common in every school; the challenge is how to overcome these barriers through linking with universities to guide staff. The added advantage of university involvement in whole school planning and professional development is that the lessons learnt also inform the delivery of curriculum to student teachers, improving the outcomes for the New Scheme Teachers entering our schools.

Conclusion and Recommendations

As a summary of the lessons learnt from my research I have several conclusions for consideration:

* + Communities of Practice are an effective way for schools to network through using technology. This reduces the time staff are away from their schools while allowing them to be in contact with curriculum experts and peers.
  + A core responsibility for leaders is to ensure that staff are supported in using technology and implementing it in the curriculum. Technology should promote engagement in the learning and development of inclusive pedagogy.
  + A sense of community is paramount. All stakeholders have a role to play and their relationships to each other and new members will determine success or failure.
  + Technology’ effectiveness in education is coupled with developing pedagogy that is advanced to use technology to meet the needs of the learner. Schools need to move away from a technology asset-planning paradigm to a digital curriculum model, where the teaching necessitates the technology.

As recommendations I offer the following:

* + Existing Equity-based funds should be identified and made available for schools to develop clusters or communities of learning through their RAM allocations. These funds can be used to share staffing across multiple schools to widen the pathways available for students in senior subjects. This can also be extended under an Equity provision for development of cross school projects K–10.
  + Protocols should be developed for schools to access legacy DER wireless access points to allow for access to curriculum servers post DER termination in schools. Linking existing DER wireless access points will allow for wider access to the Internet and foster more effective BYOD implementation.
  + Schools should be encouraged to readily link with universities to foster deeper professional learning avenues for staff.