Premier’s Xstrata Coal Rural and Remote Education Scholarship

Technology and pedagogy: levelling the playing field

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Introduction

New South Wales schools have increasing access to communications technologies such as videoconferencing, remote desktop sharing, web conferencing and webinars. As well, many have access to online collaboration technologies such as [Etherpad](http://etherpad.org/) or Google Docs. Cloud based applications such as Microsoft Office 365 and Google Apps are making it much more practical for schools to mix their hardware and even allow ‘bring your own device’ environments.

Communications technologies are used by all students, not just those who live in rural and remote areas – but they are seen as having the potential to make where you live far less relevant. There are still barriers to overcome in terms of universal access to enabling hardware, software and bandwidth. [The Digital Education Revolution](http://www.dec.nsw.gov.au/about-us/how-we-operate/national-partnerships/digital-education-revolution) has gone some distance to addressing these issues in New South Wales. Evidence from the Digital Education Revolution’s [*Report on the implications of the 2011 data collection*](https://www.det.nsw.edu.au/media/downloads/about-us/how-we-operate/national-partnerships-program/digital-education-revolution-nsw/rrql/research/der-data-collection-2011.pdf) shows that the classroom use of ICTs increases, among other things, student engagement.

Learning can be hard work and it is the student who ultimately has to do that work. In Research shows that student engagement is a vital factor in real student achievement – if you are interested, you provide your own motivation and learn better. Strong correlation is shown in research compiled by Vicki Trowler from Lancaster University in a 2010 [literature review](http://www.heacademy.ac.uk/assets/documents/studentengagement/StudentEngagementLiteratureReview.pdf).

It is time to work on how to make best use of technologies that are already available and find the most effective emerging technologies in terms of student learning.

Background

I am aware of issues that affect the learning of students from rural and remote locations. I have successfully used ICTs with students to increase engagement and improve school tone. I was interested to see how schools and education systems in different parts of the world used ICTs and social media to improve student learning.

Education systems world-wide are undergoing intense scrutiny and considerable change. Since the Global Financial Crisis, budgets have been cut with increasing calls for accountability and improved student learning outcomes. Educational researchers are investigating, among other things:

* + the use of integrated content management, collaboration and social networking systems
  + the correlation between nations’ results in tests such as the *OECD’s* [*Program for International Student Assessment*](http://www.oecd.org/pisa/) *(PISA)* and a nation’s performance in, say, science
  + the purpose of schools in western nations – there is debate about [redefining what schools should achieve](http://www.ted.com/speakers/sugata_mitra.html)
  + the effect of the USA’s [*No Child Left Behind*](http://www2.ed.gov/nclb) program
  + the training of teachers its effect on professionalism ([Dr Richard Elmore](http://www.instructionalrounds.com)).

Education Scotland has been operating *Glow*, an integrated online environment for about ten years: *Big Picture* schools work in rural and remote communities and are seamless users of ICTs; and New South Wales has *xsel*, a world-first “virtual selective school”.

Focus of the study

As holder of a Premier’s Xstrata Coal Rural and Remote Education Scholarship in 2012, I was able to travel to England, Scotland, the United States and western New South Wales to discuss, observe and learn about the use of ICTs with rural and remote students in varied contexts. The study program enabled me to:

* + engage with leading researchers in the fields of pedagogy and learning in the context of a connected world
  + observe and discuss the latest technologies being used in classrooms across the world
  + observe and participate in a wide variety of classes seamlessly using technology to access knowledge, communicate and collaborate
  + engage with students, teachers, parents, administrators and researchers
  + participate in two international conferences—the British Educational Technology and Trade show conference in London and the American Association of School Administrators conference in Los Angeles
  + tour schools participating in *xsel*
  + extend my professional network to include international practitioners and researchers, and
  + reflect on the successful practice that I observed.

The tour

**London**: British Educational Technology and Trade (BETT) conference – live demonstrations by manufacturers and developers, keynote addresses, workshops and networking.

**Scotland**: Edinburgh (Education Scotland), Perth and Kinross (*Glow*, Virtual school networks), Bernera Primary School (remote community using technology for communication). On this part of the tour I engaged with designers and administrators as well as direct users of both *Glow* and a group of Edinburgh schools which share teachers, students and subjects to offer a enrich their collective curriculum.

**New York, New Jersey, Rhode Island**: *Big Picture* schools in a remote indigenous community, a working class city district and a small provincial city. These schools share a philosophy of educating one student at a time in widely varying contexts.

**Oregon**: University of Oregon – Discussions with educator Professor Yong Zhao who has designed [*Oba*](https://www.obaverse.net/welcome/), an online collaborative environment for students of all kinds across the world. I also met with Lindy Lavender, who leads designing, building and maintaining *Oba*.

**Los Angeles**: American Association of School Administrators annual conference, attending sessions with the US Assistant Secretary for Education, principals, superintendents, educational lawyers and researchers.

**Western NSW**: Tour of *xsel* communities and schools. Discussions with the founding principal, the Teaching, Learning and Technology Officer, students, parents and community members focused on the related E2, a group of schools that cooperate to offer a richer senior curriculum.

Key thinkers

**Professor Yong Zhao**

Yong Zhao – Presidential Chair and Associate Dean for Global Education, College of Education at the University of Oregon.

Our conversation related to rural and remote education. I discovered, given that relationships are the keystone to good teaching and learning:

* + It is possible to build relationships at a distance and this University has built an integrated online learning community *– ObaWorld* – which contains:
    - a space for storage and development of evidence of learning
    - a space for connecting and social networking
    - a Moodle-based learning management system
  + we can build trust with students as members of a remote community rather than merely as consumers of information. *ObaWorld* is evolving. NSW schools are welcome to join.

Conversation of a more general nature included:

* + how short term efficiencies of a rigid system of testing at the expense of curiosity
  + PISA scores *negatively correlated* with interest in science.
  + Entrepreneurship, a common entry in 21st Century skills lists, referring to the ability to turn ideas into action, not necessarily a pursuit of money.

When Yong Zhao presented at the conference, he pointed out that while the Chinese are now topping results in tests such as PISA, they are not satisfied themselves with their education systems. He presented figures showing that 21st century skills, especially entrepreneurship and critical thinking are universally not taught in these East Asian systems and yet are required for successful economies.

**Professor Sugata Mitra**

Sugata Mitra is Professor of Educational Technology at the School of Education, Communication and Language Sciences at Newcastle University, England. He is a solid state physicist, computer engineer and educator, internationally renowned as a creative thinker at big picture and detail levels. He is the winner of the [2013 Ted prize](http://www.ted.com/talks/sugata_mitra_build_a_school_in_the_cloud.html).

Professor Mitra described his famous ‘Hole in the wall’ experiments which led to his belief that children can and should teach themselves and each other, using communications technologies to explore and collaborate. He, along with [Richard Elmore](http://www.uknow.gse.harvard.edu/leadership/leadership001a.html), believes that, in the future, schools could change at a rapidly increasing pace. Most of the researchers I had contact with believe that the most critical factor in successful learning is the relationships among teachers and students.

Professor Mitra advocates teachers posing questions that are interesting enough for students to want to solve themselves. This is a subtle, difficult thing to do and depends on a high quality relationship among students and teachers and is a shift from traditional didactic teaching.

**Bill Liao, Ian Livingstone and Jordan Casey**

Bill Liao is a social networking pioneer and philanthropist. Ian Livingstone is a fantasy author, game writer and co-founder of the company Games Workshop. Jordan Casey is a twelve year old game writer who volunteers in community projects. All three are successful entrepreneurs. At BETT, they presented strong arguments for inclusion in curriculum of technology subjects including coding from primary schooling, and for visual and performing arts to be integrated with this new curriculum. The Australian Curriculum, Assessment and Reporting Authority (ACARA) is currently writing curriculum that includes these factors. They publicised [*Coderdojo*](http://coderdojo.com/), a global group of community volunteers who help young people to learn coding by writing games in a club environment. Teachers in Rural and remote communities wanting to deliver any technology-based subject would find this a great tool.

**Deb Delisle**

[Dr Deb Delisle](http://stateimpact.npr.org/ohio/tag/deb-delisle/) is Assistant Secretary for elementary and secondary Education, US Department for Education.

Dr Delisle’s address was remarkable as it came from a very senior educational administrator and was delivered to thousands of senior educational administrators, advocating deep change in a system that had nurtured all present. Her major theme was improving teacher quality. Her ideas coincide in some ways with Richard Elmore’s contention that – that teacher training and certification are significant issues.

**Mark Edwards**

[Dr Mark Edwards](http://youtu.be/BGgNWjXzS3I) is Superintendent of Mooresville Graded School District in North Carolina. He and his team have changed the relationships in their schools using an every child, every day approach, where technology is used to individualise learning. The schools have shown such marked improvement in such a short time that the district has become one of the most awarded in the US.

**Sue Osborn, Angela Mincy and Arthur Baraf**

Drs Sue Osborn, Angela Mincy and Arthur Baraf are the Principals of the *Big Picture* schools I visited.

*Big Picture* schools include the following common emphases:

* + Relationships are vital – establish a tone of trust and decency
  + Learn deeply
  + Set and achieve goals daily, weekly, yearly
  + Students work, teachers advise, mentor or coach
  + Students must demonstrate mastery – the ‘Exhibition’ in *Big Picture* schools.

Student academic and social outcomes were positive in all schools I visited – and they could not have been in more varied contexts.

[*Lafayette Big Picture School*](http://www.bigpicture.org/2008/10/lafayette-big-picture-juniorsenior-high-school/) is in New York State and I was hosted by Principal Sue Osborn. The School has 55 students, many of whom are from the nearby Onondaga nation. In this school I saw immediate evidence of the three R’s from the Big Picture model – **R**elationships, **R**elevance, **R**igour which are accepted by students and adults as the basis of their time at school. I saw a start to the day ‘pick-me-up’ activity. These cross-curricular, collaborative activities are fun, complete within 30 minutes and led by a different member of the school each time.

A characteristic of all the classes I observed in all *Big Picture* schools is that no work is “dumbed down” and all student opinion is respected.

[*The Big Picture Ironbound Academy*](http://www.bigpicture.org/2009/03/newark-big-picture-learning-center/) is a separate entity within a much larger school in Newark, New Jersey. I was hosted by Angela Mincy and a number of students and advisers. I also visited two sites where students are doing their one day per week internships. In both cases supervisors had high praise for the commitment, ability and maturity of the students who were obviously enjoying their work supported by the advisers to apply their workplace knowledge to a major project.

[*The Met Center of Providence, Rhode Island*](http://www.bigpicture.org/2008/10/the-met-center-of-providence-and-newport-ri/) is the original Big Picture School. It is large and successful with wonderful facilities. Here I was treated to participating in Advisory sessions with grades 10, 11 and 12, a student-conducted tour of the campus, an hour with the principal, lunch with the students and advisers and time with one of the Big Picture co-coordinators. My visit was on the last day of school before a week’s break. My final activity was a ‘kick-me-out’, a sort of end of the day pick-me-up. Dr Baraf explained that some of the students would miss their school a great deal in the break and this activity was to reinforce that their supportive relationships would still be there when they returned in 9 days.

In all Big Picture schools’ long term goals are collaboratively set for individual students, that is, personalised. Some goals are aimed at passing state or school set criteria for graduation, others for specific ambitions. Each day advisers run a check-in session with a group of students where goals for the day are explicitly agreed. In all cases technology is used seamlessly to access content and expertise, with a mixture of school and BYO hardware. Cloud computing solutions will make this easier in future.

**Bill Adams and Barbara Bannister**

Bill Adams is the Deputy Principal of the E2 Learning Project in Western NSW and Barbara Bannister is Teaching, Learning and Technology Officer for the [*xsel* virtual selective school](http://www.xsel.schools.nsw.edu.au/). Barbara hosted my tour, which included school visits, conversation and interviews with students, principals, teachers and parents.

**Xsel**

This school is unique in the world. Teachers are recruited from any of the 34 participating schools. Students receive information about applying when they are in Year 6, and sit the selective schools test, with up to 30 students accepted in each cohort. It commenced in 2010 with Year 7 and there are now about 120 students in the school – the oldest being in Year 10. A staggering number of problems have been solved, including issues with parallel timetabling across the sites. xsel students are enrolled in their normal high or central school. Only English, mathematics and science are studied in the xsel environment, with xsel lessons consisting of ‘synops’ (synchronous opportunities) undertaken in a virtual class, hosted in Adobe Connect, and asynchronous learning sessions that take place in an xsel space in the local school. At all times students have access to learning materials provided by their teachers via Moodle. Mentors from the local school provide advice and supervision during these asynchronous sessions. Once per term students and teachers are brought together physically to a central location for a residential school.

Of the ‘three Rs’ I could see that relevance and rigour would not be a particular problem in a virtual classroom. The question on my mind was ‘How do you establish high quality relationships in such an environment’? In my opinion, success factors include:

* + high quality leadership, planning and support
  + staff chosen for their willingness to try new things and enthusiasm for the project
  + a standard operating environment (SOE where participants know what hardware and software are available and gain experience in troubleshooting
  + the platform – *xsel* uses Adobe Connect, which contains the tools needed
  + the hardware – consistency is desirable but not mandatory
  + reliable broadband access.

**E2**

The [E2](http://centroc.com.au/squaredeal/?p=765) project is a model that teachers should investigate if they want to set up subject and student sharing for low candidature subjects. As with xsel the major physical barrier to overcome is timetable coordination, certainly the case with the five high schools and TAFE I observed. Similar issues were solved in Perth, Scotland. In both of these cases all the schools are close enough together for bus transport to be arranged once per week, and for students to work together.

**Technologies**

xsel and E2 demonstrate that NSW public schools have already established a sound technology base for ‘wide area classes’. The Department of Education and Communities’ current ecosystem includes all software and support for Adobe Connect. This includes shared desktops, moderated chat, file sharing, a common whiteboard, video and audio. Apple and Android operating systems also provide Connect apps – tablets, even large screen phones can use this technology[[1]](#endnote-1). Most public schools in NSW exceed these requirements and, in addition, have access to Connected Classrooms – a combination of videoconferencing and screen sharing.

Microsoft Communicator provides a roughly equivalent user experience to Adobe Connect. Both have tablet versions. For jurisdictions that use the complete Microsoft environment, Communicator integrates with Outlook, OneNote and the rest of the Office suite.

My experience on the tour and elsewhere shows that consistency is more important than the choice of vendor. In Scotland, *Glow* has been operational in the SharePoint environment since 2003. Support systems have evolved so troubleshooting becomes routine and confidence builds. To use these systems effectively, teachers need to practise activities they may at first find intimidating. Professional learning, peer support and the willingness to learn are vital.

Interesting individual technologies included:

* + *ObaWorld*, University of Oregon’s online sharing environment, which costs US$1 per student per year – *ObaVerse*, a lighter version, is free
  + [Ko-su](https://ko-su.com/), an online environment for creating mobile learning objects without coding. This is one of many ‘club’ like activities that works remotely
  + Microsoft SharePoint – many vendors will build a sharing environment with all the high end features you could wish for, including the ability for all participants to have their own fully featured, moderated website
  + Portable Interactive Whiteboard technology, which now comes at a low enough price so that multiple units could be deployed in one room making this technology more suitable for small group work
  + 3D printers – while not brand new, these devices are suddenly affordable for schools and are not only useful but intrinsic motivators in the arts, science and technology subjects
  + 3D and very high quality data projectors – these are useful for mass demonstration of subjects such as anatomy, physiology and digital media. The price of these devices continues to fall.

Conclusion

Modern learners, wherever they live, need to gain skills for a new world. It is likely that many of today’s kindergarteners will see the 22nd century. While we cannot predict the future it seems likely that the pace of change will not slow. To meet the challenges our young people will no doubt meet they must learn to think independently, critically and entrepreneurially.

The people and schools I saw and the conferences I attended convinced me that models exist for rural and remote students that can put them at least level with all other students.

Vital factors for success include getting the right people involved – those who want to make a difference and are prepared to learn as they go; getting the technology right – use consistent and reliable hardware and software; and getting the pedagogy right – develop mentoring relationships with students that emphasise relationships, relevance and rigour.

I saw multiple examples of how positive relationships can be as powerful a factor online as in any live classroom. My own work in country NSW bears this out. Online environments can strip away barriers to positive relationships and deep, individualised thinking and learning.

My experience in all cases of remote learning was that students of all ages need to be in the physical presence of adults and other students at least part of the time. My own experience as a designer of blended learning bears out that students need a mentor of some kind. This can vary from a traditional subject expert to a *Big Picture* style advisor, to an *xsel* teacher to a [granny](http://www.bbc.co.uk/news/technology-17114718) (Mitra, 2012). My experiences have had a profound effect on my thinking as a learning designer and a manager of learning design projects. I often think about how I can implement the best practice I saw on my tour into my own and others’ work. In the future this will include much professional learning and resources for students and teachers.

The tour has disrupted my thinking – I believe I am thinking more deeply and correctly about my work. For this I am deeply grateful to the sponsor, the organisers and all the people I visited.

1. Adobe states that the required bandwidth for a satisfactory Local Area Network (LAN) setting experience is 400 Kbps (kilobits per second) for each presenter and each participant. With the DSL setting about half of this will be satisfactory. [↑](#endnote-ref-1)