

# 21st Century Teaching Strategies for a Highly Connected World





Professor Stephen Heppell

“I believe connecting schools together, with people in their homes and other schools, is the key to unlocking Australia’s collective ingenuity.”

# Foreword from Professor Stephen Heppell

## What happens when you connect every school and every home?

The very first time that I connected school students up to scientists in a volcano in Hawaii, through clunky old 1980s technology, their first question to the scientists was “how fast does lava flow?”

The second question, after a pause to reflect on the first answer, was “...and how fast can you run?”

I think we knew right then, three decades ago, that eventually, when the broadband connection was really good, the potential for learning to spill out of the classroom and into some really interesting places was considerable.

A decade after that and technology had made the school “walls” softer and lower.

For example, we connected up a community of primary school students, secondary school students and parents in the UK with scientists working in a research laboratory in developing fibre optic cables – similar to ones that the National Broadband Network (NBN) uses today.

Then we sat back to see what happened when they started to work together online.

It was amazing – a community of common purpose emerged as the children taught the scientists about history and badgers, while the scientists patiently explained thermodynamics.

Within a term you could barely tell the scientists from the primary school children online – that’s how far their collective knowledge had progressed.

Once again we confirmed that eventually, when the broadband connection was really good, the potential for learning would be remarkable.

And now thanks to the NBN, the number of premises able to get a really good connection will increase and we are starting to see the potential brought to life.

Helpfully, just at the same moment, learning is changing too and much of that change is coming from the bottom up, from teachers and their students. This is probably a function of the increasing pace of new technologies as they hit the steep part of their exponential growth curve with speeds doubling and costs halving seemingly monthly.

“I don’t think anyone now doubts just what a connected media-rich world we live in, but the pace of change that technology brings means this interconnectedness will be central to our economic, learning, and family lives.”

The NBN is certainly a big part of this technological leap forward. During my recent visit to Australia, I met a young sailor from Tasmania – who had just been interviewed via an online video-link for a prime job. He was reflecting on his lack of familiarity with working through a screen at a distance and felt that this is what had let him down at his interview, where he under-performed.

The NBN’s bandwidth has the potential to see a habit of remote collegiality being the norm in every classroom and Aussie children being enabled to have a real chance at grabbing those globally connected jobs. The explosive growth in online jobs worldwide offers huge opportunity, but at a time when youth unemployment in places like Spain is worse than 50 percent there is no doubt that Australian children will be in a very competitive battle for these new, high value, connected jobs.

I don’t think anyone now doubts just what a connected media-rich world we live in, but the pace of change that technology brings means this interconnectedness will be central to our economic, learning, and family lives. Australian children should be given a chance to grow up comfortable enough to flourish, and to be ingenious, within this wired new world. The good news is that outstanding classroom teachers with their engaged students are leading the charge in innovation.

We see this in the rapidly spreading adoption of phones and tablets, the explosion of video and creative authoring, the ingenious projects in social media, the adoption of multiple flat panels on classroom walls, the growth of Skype to Skype classroom exchanges and projects, and more.

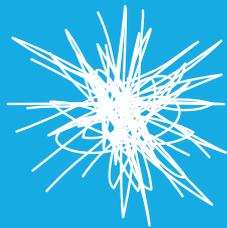
Over the last year, I have particularly enjoyed watching children and teachers from schools in Australia linking up live with other schools around the world to swap ideas about how learning might be different, and better.

This growing habit of exchanging fresh ideas has the potential to produce a generation as adept at working and communicating with the world online, as the previous generation was at exploring it with their backpacks.

Now, the pace of change in online learning is so great, we need the combined intellect of every family, every teacher, every student – and schools are the place where they come together.

They are powerhouses of intellect and I believe connecting schools together, with people in their homes and other schools, is the key to unlocking Australia’s collective ingenuity.

I can’t wait to see what happens next, because one thing is for sure, it is going to be magnificent.



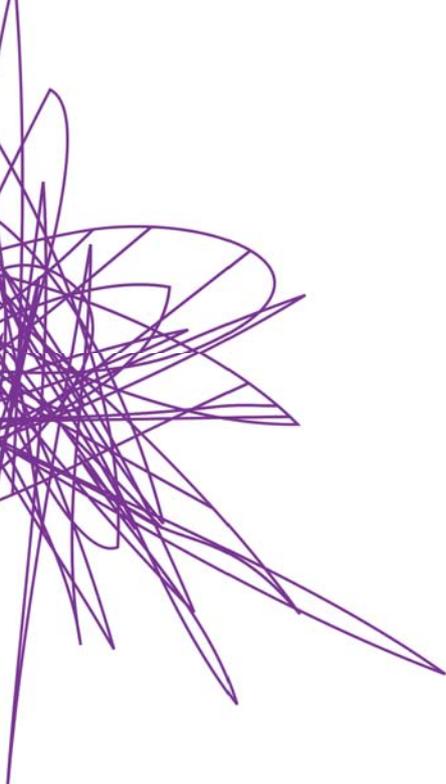
**ideaslab**  
EXPLORING NEW POSSIBILITIES

## Acknowledgements

ideasLAB and NBN Co would like to thank all the participants of the program from Willunga High School, TAFE New England Institute, Presbyterian Ladies' College Armidale, Department for Education and Child Development in South Australia, The Armidale School, The History Trust of South Australia and all businesses who supported and promoted the program.



**NBN Co**  
Bringing broadband to life



# 21st Century Teaching Strategies for a Highly Connected World

## Executive Summary

The promise of technology and access to high speed broadband in education is significant. It offers the potential of individualised instruction for every student as they become actively engaged in and responsible for their own learning. The capability to develop every student into a life-long learner is even more achievable with access to ubiquitous high speed broadband. Technology beckons educators with more opportunities for learning and increases in student achievement.

Connecting to the National Broadband Network (NBN) offers new possibilities for Australian schools, their teachers and their students. Services provided over the NBN can mean that Australian students will have access to similar bandwidth capabilities at home and at school, anywhere and at any time.

For schools that believe that new technologies provide opportunities to increase learning and teaching outcomes, connection to the NBN can provide an impetus for action. This report outlines findings from the “21st Century Teaching Strategies for a Highly-Connected World” program initiated by ideasLAB and NBN Co to help schools and higher education institutions explore the possibilities of the NBN for learning and teaching.

**The teachers worked in teams on a curriculum-based project relevant to their current practice and the needs of their students. Teams were asked to look not just at the exciting new tools, but to explore what these new tools and the NBN make possible.**

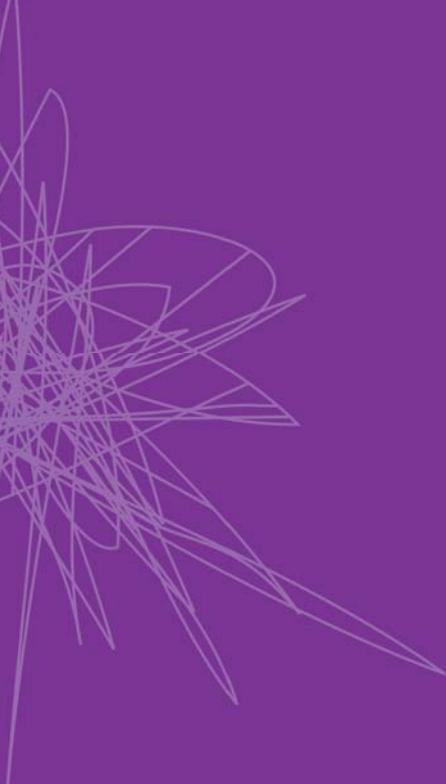
The program took place from June 2012 to August 2012 and involved 60 teachers from Willunga High School, Presbyterian Ladies' College Armidale (PLC) and TAFE New England Institute (NEI). Teachers participated in a professional learning program designed to explore ways to use technologies and services via the NBN to open up new learning opportunities in the classroom. Rather than starting with how technology can improve what they are currently doing, these teachers were tasked with starting with the question "what is now possible?"

The teachers worked in teams on a curriculum-based project relevant to their current practice and the needs of their students. Teams were asked to look not just at the exciting new tools, but to explore what these new tools and the NBN make possible.

Over eight weekly online sessions teachers were exposed to virtual pedagogies and new online technologies to simulate their thinking and expand their view of what is now possible via the NBN. At the culmination of the program, the teams presented key findings from their project in order to share the new opportunities and associated student benefits that the NBN helps make possible.

Today, teachers who undertook the program are using many different technologies and trying new teaching approaches in their classrooms. The majority of these teachers reported visible changes in their students such as increased student engagement and improved learning outcomes.

At the conclusion of the program 86 percent of the teachers involved reported that services provided over the NBN are helping them to teach in more powerful ways. Nearly all (96 percent) said that the NBN will increase their professional development and learning. Strong anecdotal evidence also suggests that the NBN may benefit students' learning and motivation, both in the classroom and at home, when undertaking projects and homework.



# Introduction

Families, students, schools and businesses in the Willunga and Armidale areas were among the first in Australia to benefit from high speed broadband over the NBN. Both Armidale and Willunga have been connected to the network since 2011. Willunga High School, PLC Armidale and Armidale TAFE were among some of the first education institutes on the mainland to be connected to the NBN.

All three institutions are committed to taking full advantage of services delivered over the NBN to ensure they offer world class education opportunities for students. This commitment is reflected in their involvement in the ideasLAB program and their future plans to continue to take advantage of the learning opportunities the new NBN infrastructure can provide.

To support these NBN-connected schools adapt to the change and opportunities that access to ubiquitous high speed broadband can bring, NBN Co partnered with ideasLAB, an education research and development incubator, to offer a teacher professional development program.

ideasLAB was formed through a unique multi-stakeholder public-private partnership between the Victorian Department of Education and Early Childhood Development, Microsoft, Intel, Cisco Systems, the University of Melbourne's Graduate School of Education and Hume City Council. Subsequently Victoria University also joined as an ideasLAB partner. ideasLAB was created as a result of the "Our Broadmeadows" Regeneration Project and a recognition that transformational use of technology would be the driver of pedagogical transformation in its schools.

The program used the anytime, anywhere professional learning model, leveraging high speed broadband through the NBN, to assist teachers to develop bold and ambitious projects ideas and lessons, for students across all ages, for use in schools across Australia.





# Methodology

Students are living and learning in a technology-rich world. It is therefore important that teachers critically discuss and evaluate their practice to ensure students are getting the most from their online experiences and that they are exploring a whole new array of opportunities for higher-order thinking and learning.

With this in mind, ideasLAB based the program on the Collective Knowledge Construction Model that aims to help educators better understand students' use of technology through four distinct strategies. These strategies – Connecting, Communicating, Collaborating and Learning Collectively influence how students learn and the way they behave online.

## Face-to-face workshops

ideasLAB facilitated two face-to-face workshops that were held at Willunga and Armidale at the start of the project to orientate the teachers involved in the program. At these workshops the participants formed their project teams and began discussing what their classroom projects might look like. The workshops introduced the concept of the modern learner and outlined the project process, expectations and outcomes of the project.

## Online course

Throughout the project eight online workshops were held, where facets of the modern learner or a new technology was presented. These sessions used WebEx to connect all participants in an online meeting space. Five sessions on modern learning were delivered by ideasLAB with external experts delivering three sessions on new and emerging technologies. These sessions were designed to be highly interactive with participants encouraged to use the chat feature to share their ideas, responses and questions.

- **Week 1** – Connecting and Communicating
- **Week 2** – Collaborating and Learning Collectively
- **Week 3** – Setting Higher Expectations
- **Week 4** – Technology Showcase – Pathways for Learning, Anywhere, Anytime – A Network for Educators
- **Week 5** – Technology Showcase - Big History Project
- **Week 6** – Interconnected and Iterative
- **Week 7** – Technology Showcase – Edmodo
- **Week 8** – Self-directedness and Personalisation



Further information on the model used by ideasLAB for 21st Century Teaching Strategies for a Highly Connected World sessions can be found in the whitepaper *“Virtual Pedagogies for Contemporary Teaching: A Model for Collective Knowledge Construction”*.

### Projects and showcase

As part of the program each project team started by assessing their current situation with a view to understanding how their current uses of technology in the classroom could be improved. They undertook specific action to meet an expressed student learning need and were then encouraged to apply an aspect of modern learning to the learning need and assess whether doing so would lead to higher student learning expectations. Project teams then implemented the strategy with their classes, evaluating both the effectiveness and appropriateness for their students.

For example, the Senior Science team at Willunga High School considered how *online collaboration*, an aspect of modern social learning, could lead to higher expectations. Rather than verbally ask a question to the class, as they would normally do, they instead post questions and videos online. According to Ben McDonald, Science teacher from Willunga High School:

*“Students interacted with other students through their replies and built upon learning from other students instead of just the teacher.”*

Ben also noted “a lot of students who wouldn’t normally participate are now participating at quite a high level.”

At the conclusion of the project, an online showcase was held where project teams shared their student learning projects with the rest of the project participants. Project teams, like Ben’s, shared their successes, failures, learning and plans for the future.

“...a lot of students who wouldn’t normally participate are now participating at quite a high level.”

# Background

Without deep experience of online learning, many teachers today are limited to a backwards view of technology, backwards-looking because they only see technology's value in light of what they already know and do.

For this project, teachers were asked to take a forward-looking approach. They were asked to consider the idea of the modern learner, and by understanding how this modern learner uses modern technology to learn, identify opportunities for their own students.

## Who is the modern learner?

There are modern learners in every classroom. In fact, the majority of students are most likely modern learners, as their first point of call when they need to know something is the Internet. They use technology to share with their friends, they use technology in their down time and they use technology when they have serious learning to do.

For the modern learner, learning isn't just individual; it is a shared social experience. It is not what the students know, but what they all know together. For the modern learner, learning isn't about the recall of facts, for these are only a search away. Instead learning is about solving real problems and addressing their individual needs. Finally, the modern learner doesn't rely on a single expert or single opinion, students use modern technology and the Internet to draw on many different influences.



## Catering for students' individual needs

Haley Nightingale, a special needs teacher at Willunga High School, says services delivered over the NBN and student laptops have "completely changed my methodology of teaching... it made us take a step back, we became facilitators rather than just doing chalk and talk... it allowed us to personalise learning for our students."

Hayley and her colleague Leisa Yanner used Edmodo, an online student community, with fifteen students with learning difficulties, posting learning resources and videos. "I have a student with a hearing impairment. By using Edmodo he was able to access all of his learning materials, video included, over and over whenever he needed, wherever he needed to. If I had just spoken the information," said Hayley, "he would have only retained around thirty percent of it and the rest would have been gone."

A student from Hayley's class commented "I have challenges with doing math, English and contributing to class verbally. The new approach Miss Nightingale is taking is making it easier for me to be able to learn and communicate. It makes it a lot better to know what other students are doing so I can get ideas for my work."

**"...[services delivered over the NBN]... completely changed my methodology of teaching... it made us take a step back, we became facilitators rather than just doing chalk and talk... it allowed us to personalise learning for our students."**

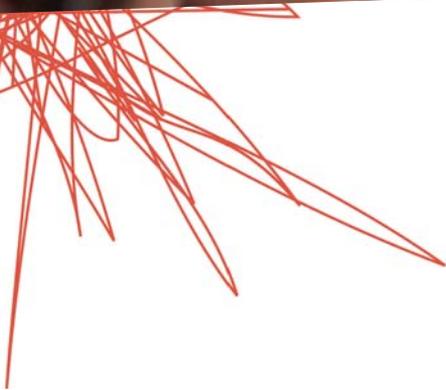


# About Willunga High

In September 2011, Willunga High School which is situated in the McLaren Vale Wine growing area of South Australia, became the first government secondary school connected to the NBN on mainland Australia. Prior to connection, Willunga High School and Primary School took part in a Sydney University baseline community study of pre-NBN technology use as well as their views on the capabilities of the NBN, with 422 students surveyed making "it one of the biggest surveys of its kind carried out in a single community." (Gregg, M. & Wilson J, Willunga Connects: A baseline study of pre-NBN, Nov 2011).

This survey found that primarily students used a personal media device and watched TV daily but did not engage with traditional books and print media. Students used social media to communicate, watched YouTube clips regularly and played games on their computer devices. Additionally, 84 percent of homes had a laptop computer and 75 percent had a desktop computer. With Willunga homes and the schools being connected to the NBN, there was the potential for the walls of the traditional classroom to virtually disappear. Students believed that the NBN would make the Internet faster, however there was little awareness of the potential benefits to their learning.





With the NBN coming past their very doorstep, the educational community of Willunga High School saw an opportunity to transform teaching and learning for students, teachers and community members to encompass 21st Century learning skills. In order to reap the benefits of the NBN, the school fast tracked strategic planning to facilitate a change in teaching and learning that had not been possible prior to the connectivity and fast upload and download speeds of the NBN. The school identified three areas that needed to be addressed in order to move ahead:

1. Review of the school's current IT infrastructure and the network coverage in relation to the use of the NBN for learning.
2. Provide staff with the digital learning tools required to begin their journey and be co-learners with students;
3. The development of a team of e-learning champions who would be the drivers and role models of this new learning environment and could share their learning with other teachers who were not as 'tech savvy'.

Then an opportunity arrived through the IdeasLAB program which provided extensive professional development for 42 staff to volunteer to explore new and exciting technologies and ways of embedding these into their teaching and learning programs. This professional development provided a springboard to bring about whole-school change to Willunga High School's learning ethos and allowed staff the permission and safety to try new digital tools in their classroom practice.



**“Our teachers believe that they are no longer the holder and deliverer of all knowledge and that they are now the sculptor of this new way of learning by utilising the potential of the NBN.”**

## From the Principal

### Janelle Reimann, Principal, Willunga High School

I have found that the *21st Century Teaching Strategies for a Highly Connected World* program provided Willunga High School with a foundation for teachers to build their confidence, knowledge and expertise. With these new skills teachers have been able to springboard into the future learning environment necessary to inspire, motivate and encourage students to spread their learning beyond the walls of the classroom and be co-learners in this journey.

The NBN has facilitated a revolutionary change in the delivery of content and co-contribution of learning input. It has given students an equal voice in what they want to learn and how they wish to learn it, bringing the world into their classroom.

Our teachers believe that they are no longer the holder and deliverer of all knowledge and that they are now the sculptor of this new way of learning by utilising the potential of the NBN.

At Willunga High School we have only just begun our transformational journey using the power and connectivity of the NBN to engage our students in their 21st Century learning. We are currently working as co-partners in a number of projects funded by the Department of Education, Employment and Workplace Relations to take advantage of this new way of learning. These include Monash University and the John Monash Science School (Quarks to Quasars) which will expose our students to cutting edge synchronistic collaboration using video conferencing and virtual classrooms. We are also partnering with the University of NSW on the Education 2020 project which uses the context of Mars Exploration to engage students in all of the sciences and mathematics. Our students will be able to plan and drive a rover through a Mars Mission remotely using their laptops facilitated by the speed and seamless transmission of the NBN.

Additionally we are also looking at how we can deliver programs to our elderly community to break down the generation gap of technology so that they too can use the NBN in their homes and lives. We had a highly successful trial for this program already this year and look forward to continuing to work with our students and the community. We will also be running Youth Opportunities, a student leadership program, and hosting senior math, chemistry and physics classes with other schools via videoconferencing. This will ensure student learning pathways are maintained and that the students involved are still able to remain in their home school.

New and exciting opportunities are evolving as we progress on our journey. We grasp these opportunities, say “YES” to everything and then mould and adapt these to meet our staff and student learning requirements and needs. It is an exciting time to be part of this new learning space!



## Case Study: Shakespeare's sonnets brought to life with live video link up

When studying Shakespeare's 'The Tempest', Willunga High School drama students were given a special learning experience. Bell Shakespeare, one of Australia's most distinguished theatre companies, hosted an online interactive workshop with the high school from the Sydney Opera House.

Facilitated via a video link through the school's connection to the NBN, the workshop enabled the students to receive instruction from a Bell Shakespeare tutor in real time.

Head of Drama and Arts Coordinator, Rob Seidel, comments, "I've never been involved in a virtual link-up, but I was amazed at how the tutor and the students were able to easily interact. It showed me that though we are located hundreds of kilometres from the Sydney Opera House and the Bell Shakespeare Company, our students can still have a one-on-one learning experience with an expert in another state. By using online technologies such as video link up, wonderful experiences and lessons are in reach."

"Because of the NBN connection and the quality of the image the students really flourished. I've been a teacher for 34 years in drama and most of my teaching has been within the four walls of the classroom. This has really taken it to a completely different level and has made both myself and the students aware that there is another way to learn and a new way to teach."





# Case Study:

## Excited students reaching for first rate results

The online community, Edmodo, was used by many of the teachers throughout the pilot programme. It was used to facilitate communication and collaboration between the teachers and class and among class members.

Thomas Gradisar, a history teacher at Willunga High School used the platform to engage with students who were preparing for their SACE (South Australian Certificate of Education) during the school holidays. All students had the opportunity to post questions on exercises and materials in preparation for their final exams which were then answered by other students or by the teachers.

Thomas said that as well as the students being engaged, they were able to help each other and so it created a real sense of 'togetherness'. This ubiquitous access to high speed broadband over the NBN meant Thomas was able to communicate with all of his students at the same time leaving no one at a disadvantage.

"Students who were previously handing in C grade work are now producing A grade work. By using online sources and combining it with insights shared from their peers and with the materials that I provided they were able to create much better work."

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## A culture of collaboration

Rob Love, an English teacher at Willunga High School, used an online community to build what Rob terms a “collaboration culture.” He expanded, “I wanted every student in the class to take responsibility for the learning of every other student.” Students shared their draft work with each other in real time, to refine and get feedback before they submitted their work. Initially Rob directed this, but eventually the collaboration was directed solely by the students. “It actually blew the students away when I suggested that students help each other and share their answers during the test, to ensure that everyone passed.”

The first time the students were encouraged to post comments online in real time was during a viewing of the documentary *Bowling for Columbine*. Students were asked to post their reactions during the viewing and by the end of the class there were 197 comments from the students. Rob says that usually in an activity like this he would only be able to get feedback from the five top students. “This synchronous communication over the NBN helped students who are less confident put their thoughts into text online and their peers were able to feedback and support them to improve learning for all students.”

“Access to high speed broadband over the NBN has encouraged us to really examine our pedagogy to get kids connected. It provides a depth to the resources and real time online interactions for the students learning. They’re demanding this stuff outside the classroom and if we don’t provide it during their learning in the classroom they don’t engage.”



## Ben Caruso

### English teacher – Willunga High School

Ben Caruso, an English teacher at Willunga High School, wanted to use an approach in his project that was outside the box to get students working in a collaborative environment. Ben's project asked his students to use blogs to "reflect and express ideas...and receive instant feedback from peers as well as their teacher." By using blogs students would be able to engage with each other using learning tools, sharing videos and links and leaving comments to provide feedback to each other.

Ben said, "We started by posting ideas that our students would be interested and keen to write about." Although, Ben guided his students in what they wrote about, he also gave them freedom to explore their passions. "I found the students developed a digital identity, they love speaking to others, and it gives them a purpose and meaning."

"I was surprised at the efficiency of broadband over the NBN. The engagement and the participation from students has increased, especially from students who I usually wouldn't get a lot of writing or information from. Now my students can access information via YouTube with the click of the button. It really is access to information anywhere anytime."

"I was surprised at the efficiency of broadband over the NBN. The engagement and the participation from students has increased, especially from students who I usually wouldn't get a lot of writing or information from."

# About TAFE NSW New England Institute

TAFE New England Institute (NEI) is a Registered Training Organisation (RTO) that is recognised throughout the New England and north-west region of New South Wales as the most important and significant provider of vocational education and training in the region. NEI delivers a range of training and assessment services, offering about 400 courses to more than 20,000 students, utilising modern technology for a competitive age.

Students have access to a range of up-to-date learning materials including libraries with internet access, on-line catalogues and access to electronic databases, comfortable and modern classrooms, workshops, study rooms and laboratories. It is also one of the first educational facilities to be connected to the National Broadband Network, allowing it to develop innovative and flexible solutions to deliver training. A group of six NEI staff participated in the 21st Century Teaching Strategies for a Highly Connected World program.



## Making virtual learning a reality

A classroom in the cloud<sup>1</sup> sounds like the stuff of fantasy but for students and staff at TAFE NSW - New England Institute it is already becoming a reality. According to Judi Gowling, Learning Technologies Officer at TAFE NSW - New England Institute, the goal of their project was to create a “collaborative, experiential learning environment in the cloud... so we can respond in imaginative ways to changing student needs.”

With the cloud and high speed broadband, the possibilities for learning are many and varied. Judi’s project team, appropriately named Cloud 9, trialed a wide range of new and emerging technologies. This included Coach’s Eye, an application providing video analysis of physical activity; Foliospaces, for e-portfolios; and Voice Thread, which provides communication and collaboration in the cloud. According to the team, “there are many cloud-based emerging technologies that can have a huge impact on traditional models... [resulting in] related learning that is limitless and mind blowing.”

In practical terms, the Cloud 9 project means that teachers and students are able to log on to full classroom resources from anywhere, says the Acting Learning and Assessment Development Co-coordinator, teacher Lyn Graham. While this concept already exists in online learning, the cloud and access to the NBN helps reduce the technical barriers to these services that students currently experience.

<sup>1</sup> Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet).

## About PLC Armidale

PLC Armidale is an independent girl's school in regional NSW. Although small in student population (320 girls - Pre-kindergarten to Year 12), the school is progressive, outwardly engaged and intent on building confident, caring and connected Australian citizens. The school was delighted to participate in the first rollout of the NBN on the mainland and hosted the official launch by Prime Minister Gillard in May, 2011. PLC Armidale formed a working group of teachers to work with NBN Co and ideasLAB to explore teaching in this highly connected environment.



“This will be a very steep learning curve and the “big picture” vision from Bruce Dixon and the ideasLAB team will be an important guide through this process. This is an exciting time in the journey of PLC Armidale.”



## Pursuing student interests

The project team from PLC Armidale started looking at the specific applications and online learning spaces that are now available. “I wanted to reach all of the students in the class,” explained PLC teacher David Moffitt, “so that all students felt that they had something to add... it gave the students a lot of task ownership.”

David continued, “Where this took us, and I didn’t expect this, was that the students responded to tasks that was more in keeping with who they were and their strengths and interests.” David found that his students were using communication technologies to collaborate outside of class based on the projects they were working on at the time. “The students understood that these technologies, enabled by services delivered over the NBN, are for serious learning.”

Following the course PLC Armidale is now moving to a more autonomous learning style, tailored to individual student’s strengths. In Year 7 and 8, teachers have trialed a “matrix” approach to delivering content. Students are encouraged to consider their preferred learning style using an eBook created by the teachers and distributed onto the student’s iPads. Students then explore the unit of work via a matrix of possible activities and experiences, collaborating and presenting their understanding in original and appropriate ways.

Video conferencing is also becoming a more regular part of normal teaching, linking classes with experts such as the Museum of Human Disease at UNSW to see dissections of healthy and diseased hearts.

For 2013 the future looks even brighter with PLC Armidale adopting a learning management system to allow online access to all classroom content, assessment and conversation. Lesson content will be available for download, online discussion, quizzes and online submission of assessment. A parent portal will allow parents access to their child’s progress and performance throughout the year via a dashboard view across all subjects.

David said, “This will be a very steep learning curve and the “big picture” vision from Bruce Dixon and the ideasLAB team will be an important guide through this process. This is an exciting time in the journey of PLC Armidale.”

Over the ten weeks teachers reported seeing visible changes in their students and their classrooms.



## Key findings

At the conclusion of the program, teachers were invited to complete an anonymous survey to provide evidence of the value of using the NBN in schools. It was found that teachers involved in the program are now using many different technologies in their classrooms with their students and are also trying new teaching approaches.

Rob Love, English teacher at Willunga High School, summed it up when he said:

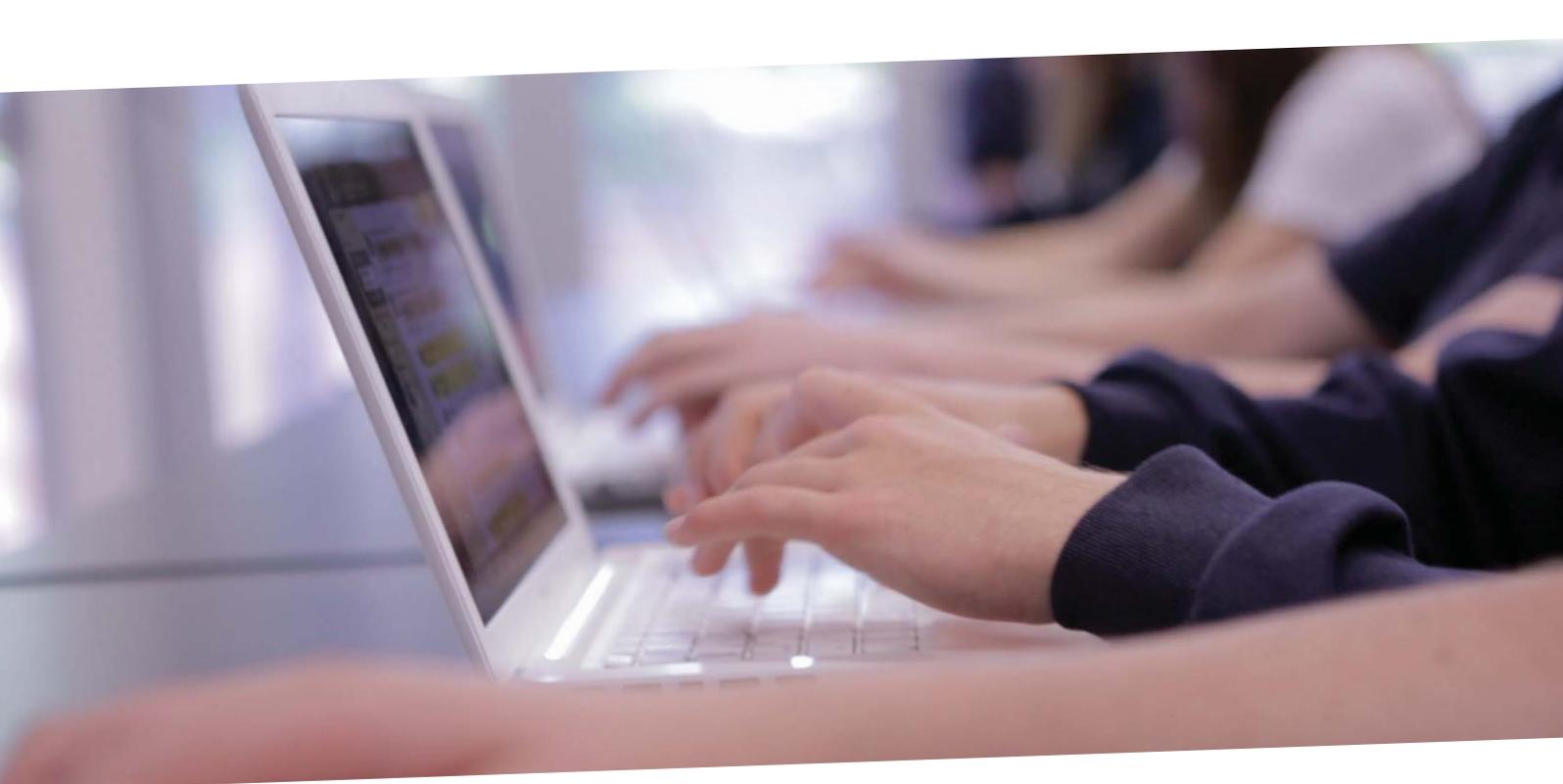
*“If we teach the same stuff in the same way it doesn’t matter what technology we use, we’ll get the same results. I tried to change the way I delivered my curriculum, in order to get a different outcome for my students.”*

Over the ten weeks of the program, teachers reported seeing visible positive changes in their students and their classrooms. This in turn led to further reflection around the imperative to respond to the opportunity technology and the access to high speed broadband over the NBN offered.

Many participants relayed that in addition to student engagement there were changes in students’ learning outcomes, due to the use of 21st century teaching strategies that respond to the needs of the modern learner.

Haley Nightingale, a special needs teacher at Willunga High School reported that:

*“The currency of the topics and the information the students were able to access matched the quality of their engagement. The quality of the work they produced was vastly improved.”*



## The project survey findings reveal that:

**96%** of teachers agreed that the NBN will increase their capacity for professional development and learning

**93%** said it will allow them to expand their personal learning networks

**86%** said the NBN will enable them to teach in more powerful ways

**96%** believe the NBN will allow students to achieve more and increase the quality of their work

**82%** said that the breadth, depth and relevance of their learning experiences will be increased

**89%** said students will be able to engage in richer, deeper and more ambitious inquiry-based projects

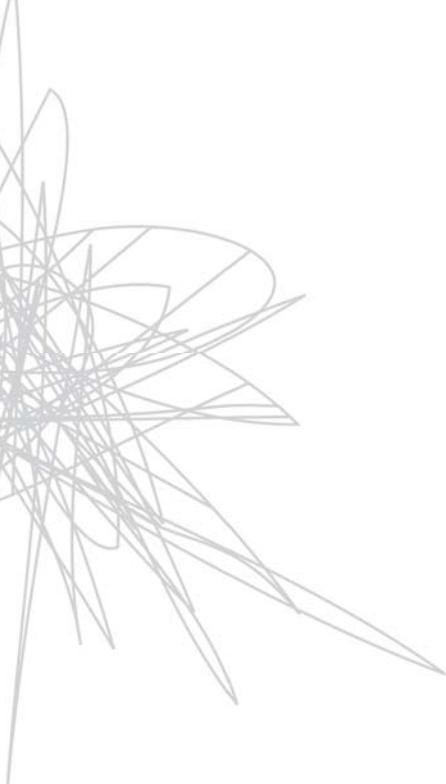
**93%** of teachers said students will be able learn with and from others

# Conclusion

Connecting a school to the NBN can be an impetus for its teachers to reimagine their curriculum and set higher learning expectations for their students and their professional development. For schools and teachers seeking to leverage the potential benefits of services provided over the NBN, it is recommended:

- Prior to connection to the NBN, it is essential that schools address the pedagogical and technical considerations. Specifically, they must have a strong sense of the role of technology in learning and teaching, and plan for increased student use of computers and wireless networks.
- Teachers require support, guidance and permission to explore new possibilities. This is most successfully achieved when teachers work in teams to explore their current practice in light of the global changes happening in online learning.
- Teachers' technology skills and experience across a school will vary greatly, as will their opinions on the role of technology in learning. Therefore, whole school change requires strong and clear leadership to drive a consistent and shared vision that leads to scalable and sustainable change.





# Appendix

## **Bruce Dixon** Director of ideasLAB

Bruce Dixon, has more than 25 years of worldwide experience working with schools. Bruce consults to schools, School Districts, Education Departments, Ministries of Education as well as technology companies such as Microsoft, HP-Compaq, Apple, and Toshiba on 1:1 teaching and technology in education.

## **Richard Olsen** Assistant Director of ideasLAB

In his role at ideasLAB, Richard identifies new technologies and their transformative possibilities for schools and for learning. Richard is interested in online learning communities, social networking, inquiry-based learning and game-based learning. Richard is the author of ideasLAB's white paper Understanding Virtual Pedagogies for Contemporary Teaching and Learning.

## **Dr Sofia Pardo** Lead Researcher of ideasLAB

Dr Sofia Pardo has over 10 years of research experience, having completed a PhD at The University of Melbourne on the evaluation of educational software for primary school children. Before joining the ideasLAB in 2009, Sofia was part of the Research Branch at Department of Education and Early Childhood Development where she had a key role in building research capacity across the department.

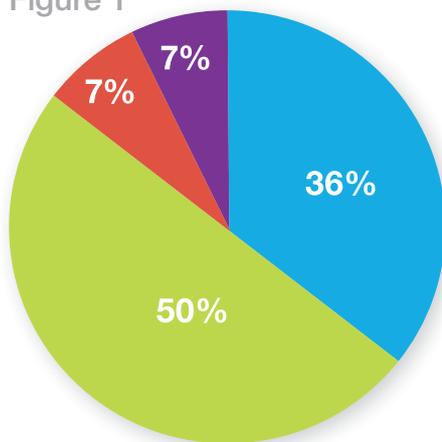
## Links and Further Reading

- Understanding Virtual Pedagogies for Contemporary Teaching and Learning  
<http://www.ideaslab.edu.au/design-lab/ckc/>
- NBN Co  
<http://nbnco.com.au/schools>
- Willunga High School  
<http://www.whs.sa.edu.au/>
- PLC Armidale  
<http://www.plcarmidale.nsw.edu.au/welcome-to-plc.php>
- TAFE NSW – New England Institute  
<http://www.newengland.tafensw.edu.au/>
- 21 Steps  
[http://epotential.education.vic.gov.au/showcase/download.php?doc\\_id=1024](http://epotential.education.vic.gov.au/showcase/download.php?doc_id=1024)
- WebEx  
<http://www.webex.com.au/>
- PLANE  
<http://my.plane.edu.au/>
- The Big History Project  
<http://www.bighistoryproject.com/>

# Survey Results

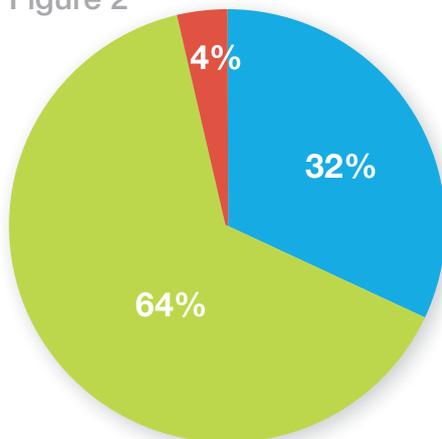
The NBN will enable me to teach in new and more powerful ways

Figure 1



The NBN will allow students to achieve more and increase the quality of their work

Figure 2



- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- I have no students

On completion of the program, participants were asked to complete a survey to share their views on what the NBN would make possible for their professional learning and the learning of their students in their classrooms.

The survey found that teachers have high expectations around the impact that the NBN will have on their professional learning and their teaching practices. The majority (96.4 percent) of teachers agreed or strongly agreed that the NBN will increase their capacity for professional development and learning and that it will allow them to expand their personal learning networks (92.8 percent).

The ability to teach in more powerful ways was something many respondents considered would be made possible thanks to the NBN. An increase in the quality and relevance of teaching was also associated with the NBN availability by respondents (see Figure 1).

Teachers also showed high expectations around the impact that NBN will have on student learning experiences and outcomes. The vast majority believed that the NBN will allow students to achieve more and increase the quality of their work (Figure 2); and that the breadth, depth and relevance of their learning experiences will be increased, as indicated by 82.2 percent of respondents.

An increase in students' ability to be self-directed learners (89.3 percent), engage in richer, deeper and more ambitious inquiry-based projects (89.3 percent) and learn with and from others (92.9 percent) was considered by the majority of respondents a potential consequence of the quality of internet access offered by the NBN.



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