Macquarie ICT Innovations Centre

Future Pedagogies

Project Report

2015-16

Future Pedagogies is a report published by Macquarie ICT Innovations Centre, representing a collaboration between the Department of Educational Studies, Macquarie University and the New South Wales Department of Education.

NSW GOVERNMENT Education Public Schools

MACQUARIE University SYDNEY·AUSTRALIA


OF THE

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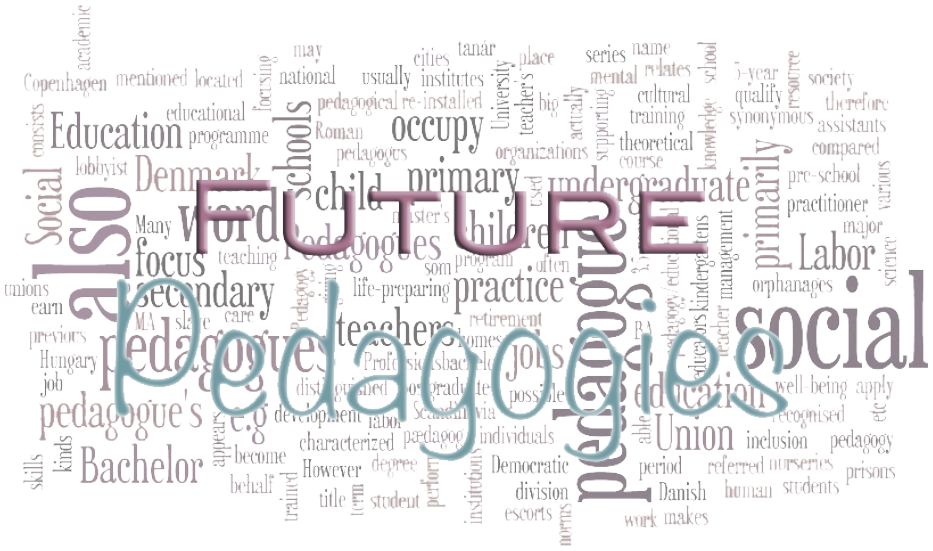
The research forming this Report was conducted jointly by staff at the Department of Educational Studies, Macquarie University and staff at Macquarie ICT Innovations Centre (a joint collaboration between the NSW Department of Education and Macquarie University). The support from the participating NSW Department of Education schools is gratefully acknowledged.

This report was prepared by Dr Kerry-Ann O'Sullivan, Michael Stevenson, Cathie Howe and Khyiah Angel. Website and project administration, graphic design and photography and event management were all provided by Lyrian McGregor.



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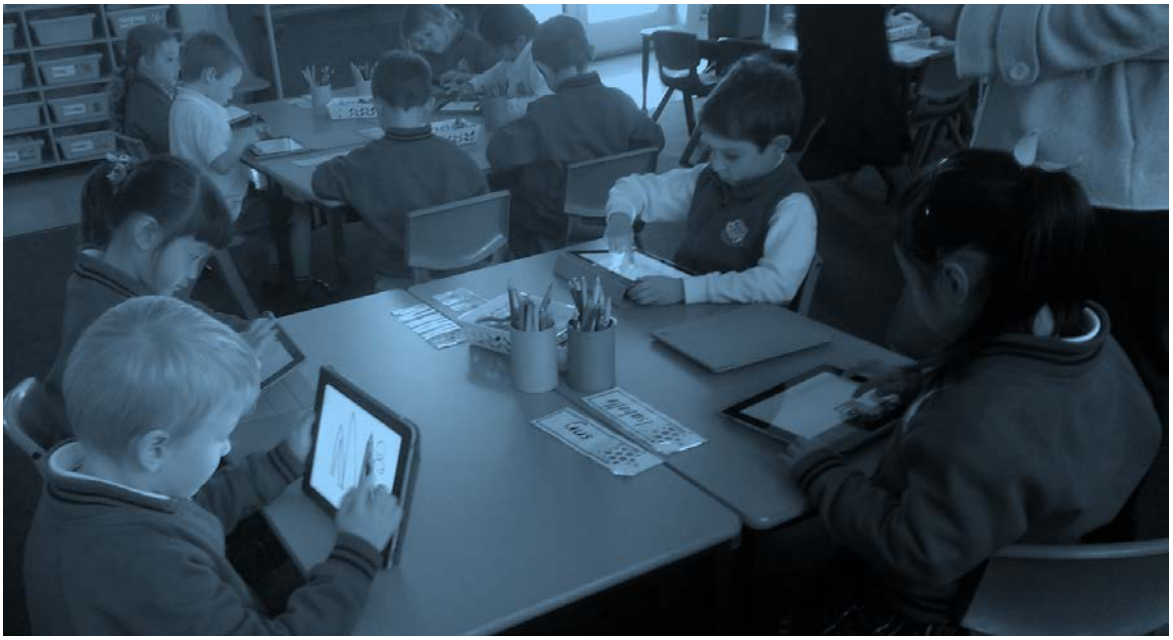

Executive Summary

Future Pedagogies explored how educators develop, employ and evaluate pedagogies to meet the evolving needs of their school communities. The project examined the relationship between pedagogical change and evidence-based practice. Its purpose was to immerse teachers in research that was relevant to their contexts and which could inform their pedagogical development. Participants applied issues in current research to identify pedagogy-related problems in their school context and to develop a strong evidential base to work through solutions and effect meaningful change. The project considered the nature of pedagogical change in the context of the realities contemporary schools face, including the implementation of national teaching standards and curricula, impact of technology and pressures of high stakes testing.

This project was developed as a research and professional learning partnership between Macquarie ICT Innovations Centre, Macquarie University's Department of Educational Studies, and the Department of Education in December 2014 and was carried out through 2015. Potential participants were invited to submit expressions of interest through responding to a questionnaire that examined pedagogy-related professional learning, decision-making and teaching practices within the school community. From these responses, an intensity sample was identified for further investigation through this collective case study. Eight schools participated with a mix of Primary and Secondary schools and they represented four metropolitan and four regional areas. In total there was fifty-two participants, which included both school leaders and teachers. Metropolitan schools were allocated AU$5000 and regional schools were allocated AU$8000 to cover their costs associated with the project. Expenditure was targeted to staff release and professional learning, to cover travel and

accommodation costs and in a small number of cases, an amount was spent on technology resources.

As part of their involvement in this project, school leaders were encouraged to develop relevant professional learning for their contexts based on research findings, the identification of specific problems that impact on pedagogical fluency, and in consideration of the needs of their community. Professional learning workshops were conducted in conjunction with the research activity. A final Showcase provided the participant schools with the opportunity to report on, and to present their pedagogical project achievements.

Four research questions were addressed in this study:

1. What are the skills that enable teachers to employ pedagogies suited to the specific learners and learning context?
2. How can schools develop and draw on a common language for pedagogy to establish successful learning outcomes?
3. What are the necessary elements of pedagogical fluency and how can these be developed?
4. What role can contemporary technologies play in developing pedagogies for current and future learning needs?

Data were gathered in four stages through one-on-one interviews and focus group interviews, school based visits and classroom observations, online survey instruments, participant reflections and evaluation questionnaire.

To educate contemporary students, there was a recognised need to focus on developing skills in the areas of creativity, lateral thinking, problem solving, flexibility, risk-taking and collaboration. Facilitating learning rather than transmitting knowledge was viewed as a priority and for practice to be 'authentic' and developed in relation to the learner and contextual factors. Most participants saw the need for effective professional learning to bring about a change in pedagogical practices. The enhancement of professional learning was identified as requiring professional autonomy within and beyond school- and system- led development, greater networking and collaboration within and between schools, expertise being built across all staff, and through leadership initiatives to drive change.

Teacher fixed mindsets and traditional beliefs with the holding of a 'technical' view of practice presented challenges to innovation and pedagogical change. Collaboration between teachers – building learning communities to share ideas and approaches and collegial discussions with time allowed for the application of new pedagogies were seen as important next steps in developing and articulating pedagogical practice and in supporting change.

Since pedagogies incorporate a range of methods, models and frameworks that can differ considerably from one context to another, forming a common language amongst educators is especially challenging. The value of knowing and making connections between theory,

research and practice was highlighted as a way forward to enhance pedagogical understanding and application.

Each school community has a range of contextual factors that will support or impede the processes of pedagogical change. Barriers to advancing pedagogy included degrees of teacher flexibility and understanding, the nature of professional learning, leadership initiative and support, time, availability of resources, and importantly, contextual factors such as issues of student engagement/ disengagement.

The concept of pedagogical fluency held relevance for both principals and teachers but there are challenges implicit in the process of educators becoming *pedagogically fluent*. Pedagogy was understood to mean more than just one model or approach and it was agreed that a 'one size fits all' approach was unsuccessful. Implications in relation to student equity were raised in light of the wide variation of pedagogies found within schools.

To be pedagogically fluent requires learning and teaching to be supported by well chosen and evidentially based approaches that are responsive to the needs of learners in a specific community so as to create deep learning, student engagement and ongoing critical reflection. This was still an aspiration in the participant schools although at least one primary and one secondary school were identified as being well along the pathway to success.

Across all the participant schools a wide range of technology tools and platforms was employed to promote different forms of teaching and learning. There was clear evidence of the use of technology to support more student-centred pedagogies, especially forms of learning that were self-paced, personalised, authentic and which utilised current tools for digital creativity. However, in a significant number of cases technology was used merely to fit traditional pedagogies and it was not pedagogically central to students' learning or to in class activities. Access to technology infrastructure remained inconsistent, and presented a difficulty in being unevenly distributed across the schools. Regional schools experienced some disadvantage in this respect.

Tangible achievements were revealed and the value realised for students and teachers when their leaders promoted pedagogical fluency even where they were faced with contextual and resourcing constraints. The acknowledged importance of educational leadership was noted here and it took a variety of forms including holding the initiative for change, providing support to those teachers who were innovative and collaborative and leaders in their own way, building educational priorities, and setting a vision for ongoing reform. In some cases, this was in the early stages as these leaders appeared to know what they hoped to achieve but this had not yet been realised in practice.

All principals were able to articulate a vision for future pedagogical change in their school community. For most principals, this also involved a discussion of the challenges that needed to be overcome in order to achieve their intended changes.

Schools reported that the project's design of the research and the professional learning program worked well for them and that their involvement in *Future Pedagogies* had an impact for their school community. For some this was not necessarily positive in that their work in the project forced a re-evaluation of their current pedagogies and a review of the prevailing cultural context of teaching and learning in the school. The involvement, particularly of some of the regional schools, allowed principals to identify priorities for their leadership teams and for them to consider the project achievements and pedagogically informed technology uses of colleagues from other schools. Participants indicated that the stimulation of research, speakers and new ideas coupled with professional learning activities and the opportunities for networking through the learning community provided them with a rich base for their critical reflection, challenge, encouragement or validation.

A final showcase afforded schools the opportunity to share the ways they addressed the pedagogical problem they had identified in their aim and to evaluate their project work for the rest of the participating groups. Each school addressed their strategies, challenges, achievements and professional learning and indicated their ambitions for the future in outstanding presentations and they spoke with impressive candour. It was clear that there is a strong desire amongst educators for more support and resources in schools and for professional learning that has an explicit research basis and collegial engagement, and which develops teachers' pedagogies for learning in the digital age.

1. Educational Context

Pedagogy is an integral part of education, schools and communities of teachers and learners. The term reflects a wide range of meanings and discourses that speak to the complexities of contemporary teaching and learning. Traditionally regarded as singular, the term now features more prominently as *pedagogies*, suggesting beyond its etymological meaning – *to lead* - that the directions in which we are leading learning are many and varied. In most contemporary school settings, multiple pedagogies are enacted, applied and explored. Current educational policy in New South Wales Schools states that "there is no one single effective teaching method or strategy", while calling for greater proficiency in "many teaching practices and, more importantly, to be able to to assess their impact on students and adapt their teaching practices to assist students if they are not responding or engaged" (Department of Education & Communities, New South Wales, 2013). This call is echoed in educational research that speaks to the underlying nature of *pedagogies* as multi-dimensional, context-specific and continually evolving, while at the same time being "strongly influenced by cultural perspectives on the objectives of schooling" (König, Blömeke, Paine, Schmidt, & Hsieh, 2011). In spite of a considerable body of research findings, however, a complex combination of factors influences pedagogical outcomes. As such, attempts to realise what might be universally defined 'best practice' remain problematic.

Currently in Australia a range of broader policy and social issues intersect with the pedagogies that are continually evolving in most school communities. Some researchers refer to the push towards national curricula, teacher accreditation, high-stakes testing and leagues tables as reflective of neoliberal marketization (Connell, 2009; Hardy, 2013, O'Sullivan, 2016). The implications of these forces suggest that increased accountability has led – and may further lead - to a narrowing of pedagogical strategies and practice (Klenowski & Wyatt-Smith, 2012; Lingard, 2010; Valli & Buese, 2007). The contested territory in current policy and curriculum is further shaped by the values that underlie the implementation of specific pedagogical approaches such as inquiry-based forms of learning in some versions of the Australian Curriculum (see, for example, Lupton, 2014). Similar debates have existed around other aspects of pedagogy, such as the "Reading Wars", between exponents of whole language and

explicit literacy instruction (Loveless, 2011), recent debates about whether or not open plan classrooms of the 1970s can be reinstated and redefined as twenty-first century learning spaces (Shin & Siebein, 2012) or the ongoing debates between advocates of student-led inquiry and those of teacher-led direct instruction (Kirschner, Sweller, & Clark, 2006).

The research landscape of empirical inquiry into pedagogical practice shows the complexities of its evolution from what Hargreaves (2000) terms the "pre-professional" era of didactic, teacher-led instruction to the present time of so-called "digital pedagogies" and "twenty-first century learning". Shulman (1986) was among the first to explore the shift from the containment of teacher knowledge within a discipline to the recognition of an important intersection between pedagogical and content knowledge. Drawing attention to the "missing paradigm", he alludes to the shortcomings of focusing largely on general pedagogical knowledge (GPK), often exemplified in discussions around classroom organisation, questioning strategies, assessment and lesson planning. In representing pedagogical content knowledge (PCK) as a new knowledge dimension, Shulman's work acknowledges the traditional focus of policymakers on curriculum content (the *what*) with their relatively limited focus on the teaching of the content (the *how*). His conceptualisation has been instrumental in the evolution of the Technological, Pedagogical and Content Knowledge (TPaCK) model (Koehler & Mishra, 2009). This incorporates Shulman's pedagogy and content knowledge dimensions and adds a third dimension – technology – to illustrate pedagogical complexity while also highlighting the significance of the contexts in which these various elements operate.

Inherent in the challenge to reconcile tensions in research, policy and practice is the need for evidence-based practice that can be developed and shared amongst educators across schools and systems through a common language for pedagogies and pedagogical change. In the shifting contexts of the twenty-first century, some have argued that evidence-based practice is as much about identifying and addressing school-based constraints that hinder effective change as it is about the identification of what future change might look like. Slavin (2002) considers that the appropriate use of pedagogy-based evidence "is essential to build confidence in educational research among policymakers and educators" (p. 15). Also important, Lingard, Hayes, and Mills (2003) argue for teachers to be repositioned as 'subjects' not objects of policy and for teachers' work to be reconceptualised in acknowledgment that they have far more agency and intellectual/ academic capital.

As we consider some of the ways forward where educators sought to develop effective pedagogical practices for our contemporary learners in times of considerable change, it is worth noting Siemens' (2006, p.13) advice.

> We are trying to use theories of learning from a predominantly physical era and force them to work in a digital era. We need a new pedagogy, a new view of learning, a new view of knowledge or interacting.

Future Pedagogies is a collective case study of pedagogies and pedagogical approaches in eight New South Wales government schools. Conducted from December, 2014 to August 2015, this project explored how educators develop, employ and reflect on their pedagogies to meet the evolving needs of their school communities. Researchers from Macquarie University closely examined the relationship between pedagogical change and evidence-based practice by investigating the extent to which pedagogy-related issues in current research were evident in the identified pedagogy-related problems in a school context. Through a series of face-to-face workshops and ongoing online communication, participants explored the relationship between their own pedagogies, recent educational reforms and the school community in which they worked.

By encouraging current educators to form a language for their pedagogies, the project aims to empower school communities to develop a strong evidential base to work through solutions and to effect meaningful change so as to enhance the learning experiences of their students. The project considers the nature of pedagogical change in the context of the contemporary realities schools face, including the implementation of national teaching standards and curricula, the impact of developing technologies and the pressures of high stakes testing.

2. Project Team

Chief Investigator | Dr Kerry-Ann O'Sullivan

Kerry-Ann is a Senior Lecturer in the Department of Educational Studies at Macquarie University, NSW. She coordinates the undergraduate major in Education, teaches Advanced Pedagogy at Postgraduate level, and leads the English and literacy program. Her research interests include the discourses and pedagogies of English and multiliteracies education and in enriching students' learning, especially in times of change. She is the recipient of National and State awards for her research and teaching, including a National Award for Outstanding Contributions to Student Learning, and she was a member of the National Curriculum English Advisory Panel. Kerry-Ann is the Chief Investigator and lead researcher on the *Future Pedagogies* Project.

Project Manager | Ms Cathie Howe

Cathie is a Professional Learning & Leadership Coordinator managing MacICT. She is the creative and strategic leader of an expanding, collaborative team that develops professional learning workshops for teachers as well as a range of student workshops. The teacher workshops focus on the challenges of designing learning that addresses content, pedagogy and the innovative integration of existing and emerging technologies in order to enhance learning and teaching across the NSW K-12 education sector. All workshops are grounded in evidence arising from research into transformative pedagogies for 21st century learners and how technology enhances learning. In collaboration with academic partners, Cathie pursues an innovative research agenda. Findings from research projects conducted through MacICT inform the education community and provide insight into new pedagogical approaches and the capacity of new technologies to enhance learning and teaching. Cathie also has expertise in building strong relationships and collaborations with a range of educational institutions and industry partners. Cathie has been involved in many research projects, including *Transmedia Storytelling: Weaving a StoryWorld Web, Researching Connected Communities 21, Augmenting Reality: Students as e-design artists, iPads in the Year 1 Maths Classroom, Game Design: Invasion of the ShadowPlague.*

Researcher | Dr Michael Stevenson

Michael is a lecturer in the Department of Educational Studies, specialising in the areas of English Methodology and ICT. Since commencing his teaching career in 2001, he has taught English, ESL, Music and Technology in secondary schools across northern and western Sydney. In addition to teaching, he has worked as a school leader in technology integration and strategic planning, advising in the implementation of learning management systems, 1-1 programs and ICT-curriculum alignment. He has also been involved in developing and implementing an integrated curriculum program that incorporates Project-Based Learning and cross-curricular team teaching in open plan environments. His recent doctoral study explored the role of technology-enabled Personal Learning Networks in teacher professional learning.

Researcher | Ms Khyiah Angel

Khyiah is currently a PhD candidate researching Multimodal Text. She has 18 years teaching experience across primary and high school settings and is also a published author of young adult fiction. She develops and facilitates Professional Learning courses for teachers focusing on multimodal text at MacICT, and teaches in the Department of Educational Studies at Macquarie University. Her qualifications include; BA.DipT (Primary), Grad Cert Education (Secondary), MA (Gender Studies), and Master of Creative Writing (New Media).

Project Critical Friend | Judy Gerber (NSW Department of Education)
Project Critical Friend | Professor John G. Hedberg (Macquarie University)
Project Critical Friend | Judy O'Connell (Charles Sturt University)
Research Assistants | Vivian Tsui Han Leung and Erin Mackenzie

Thank You

The research team expresses its sincere appreciation to all our wonderful participants and the eight school communities for their enthusiastic and generous contributions to this project.

Ethics Approval

Ethical approval for this study was obtained from Macquarie University Human Research Ethics Committee (Ref: 5201400871) and the NSW Department of Education State Education Research Approvals Process (SERAP) (Ref: 2014225). In following ethical protocols, no individuals have been identified in this study. The eight participating schools are introduced in the following two chapters but after this, no data are reported that would identify any specific school.

3. Project Participant Schools

Cessnock High School

Type of School	High
Enrolments	596
Region	Hunter Region NSW
School ICSEA value	887

"The school wide ethos of the teachers at Cessnock High School could be reflected in the statement, "We care and we are fair.' By using the resources made available in this project and improving the delivery of quality learning activities - differentiated for our students' relevant needs - we help facilitate the positive school culture embed in that ethos".

Epping North Public School

Type of School	Primary
Enrolments	430
Region	Northern Sydney
School ICSEA value	1167

"We hope to develop a harmony between curriculum, content, teaching strategies, learning environments, assessment, feedback and reflection. We want children to be active agents in the construction of their own learning".

"At EWPS we believe that affording students with the opportunity to discover and explore their passions is a necessary pedagogical challenge".

Ermington West Public School

Type of School	Primary
Enrolments	151
Region	North West Sydney
School ICSEA value	980

"… prepare our students for full participation in society, addressing our students' rural/remote/isolation needs…"

Evans River Community School

Type of School	Combined
Enrolments	499
Region	North Coast NSW
School ICSEA value	911

Jindabyne Central School

Type of School	Combined
Enrolments	681
Region	South East NSW
School ICSEA value	1044

"… enhance our teachers to move ICT integration from low level to high level order of thinking skills, in line with the Quality Teaching model. Teachers will develop and evaluate learning initiatives that focus on particular areas of the Science and Mathematics curriculum that students might normally find difficult and where a particular use of ICT could enhance learning. Teachers will be focused on how ICT is incorporated into learning activities in an authentic and seamless way, rather than the teaching of ICT or the teaching of the content in isolation".

"We want to ensure that our children are engaged, challenged learners through authentic and creative learning experiences. Additionally, we want our students to challenge us to be better teachers through student teacher feedback about how we can support their learning".

Manly Village Public School

Type of School	Primary
Enrolments	689
Region	Northern Beaches Sydney
School ICSEA value	1162

Nemingha Public School

Type of School	Primary
Enrolments	189
Region	Tamworth NSW
School ICSEA value	1019

"We would like to explore how feedback from students can improve our pedagogies. As a result students will develop self-worth, self-awareness and personal identity. Students will be deeply engaged in their learning".

Sarah Redfern High School

Type of School	High
Enrolments	475
Region	South West Sydney
School ICSEA value	903

"Overall, the project goal is to design and implement an effective and sustainable model which focuses on the explicit and continual development of teaching practice across the whole school. Inherently, this model requires a culture change which fosters collaboration, experimentation and trust between teachers and the school's Leadership Team".

Note: Average Index of Community Socio-Educational Advantage (ICSEA): value is 1000.

4. School profiles and project aims

This section provides general demographic information on each of the participating schools and a brief description of the aims stated in the school's project plan. To contextualise these aims, key insights shared by the participants are reported. The principals in this section of the report have been identified, either through their name or by association with the school in question. However, subsequent sections of the report have de-identified participants in accordance with ethical requirements for conducting the research.[1]

Cessnock High School

Cessnock High School is a rural comprehensive high school catering for students from Years 7-12. The junior school (7-10) comprises 436 students with 128 students in the senior school (11-12). There are 307 girls, 288 boys with Indigenous students making up 16% of the school population. 2% of students have a language background other than English. There is 47 teaching staff (54 FTE).

The school is aiming to increase student retention rates by offering its senior students a compressed curriculum whereby three HSC subjects are studied in Year 11 and three in Year 12. This means students take six two-hour lessons for each subject per cycle (fortnight) and complete this subject in its entirety, including Preliminary and HSC studies, in one year, sitting the external exam at the end of the year. As the principal notes, this initiative aims to address issues of student disengagement and unemployment:

> Our school community… is struggling at the moment. There's lots of data and statistics saying that… young people in Cessnock are disengaging with engaging and/or employment, and we're rated the second most disadvantaged area in New South Wales, in terms of local government area.

The participants compiling the school's report for the project drew attention to their need for teachers to confidently employ a wider range of pedagogies in order to engage more learners. Their project aims:

> …to create an environment where students are engaged in quality learning activities that are differentiated to meet their relevant needs. Teachers will have the confidence to use a variety of pedagogies to increase the engagement of their students to help facilitate this.

Elaborating on this, the principal observed that participation in the project would challenge a number of teachers whose pedagogies were more narrowly defined as a "lecture style":

[1] The ethical aspects of this study were approved by the Macquarie University Human Research Ethics Committee and by the State Education Research Approval Process (SERAP) for the New South Wales Department of Education.

> I'd actually just like for my teachers to, maybe, explore a variety of different pedagogical skills. I have some teachers that have been at the school for a long time, and they just roll out the same lesson, same technique, over and over. And I don't think that's necessarily because they are unwilling to explore different ways of teaching, I just don't think they've had their capacity to explore other ways you can deliver content. So I'd like to see teachers that are catering better for individual students, rather than performing, I suppose, a lecture style that they've been doing for a while.

When asked how they intended to broaden the pedagogies of these teaching staff, one participant stressed the importance of being exposed to new ideas – "the professional learning in the form of going to different venues and seeing different approaches".

In addition to identifying the need for a broader range of pedagogies, the school's plan outlined several areas of interest:

1. Further attention to online learning through Google Classroom digital learning environment.
2. Surveying of teachers to identify current practice
3. Use of survey data - evaluated by the project team so as to identify the specific needs of current teaching staff.
4. The team leader of the project will be invited to attend all meetings of the Technology Team (school-based professional learning community).
5. Teachers from outside the team invited to contribute, and be actively engaged in monitoring and having input into improving the delivery of the project.

By focusing their attention on technology and current practice, the school's report articulated the goal of creating "an accessible and reliable digital learning platform that incorporates high levels of differentiation within quality learning activities, and that can be easily and confidently adapted to all KLAs within the school".

Epping North Public School

Epping Public School is an urban primary school catering for 376 students (181 girls and 195 boys) from Kindergarten to Year 6. 25% of students have a language background other than English (LBOTE), while there are no students who identify as Indigenous. There is 22 teaching staff (21.7 FTE).

As the current principal observes, the school has had a consistent cohort of "experienced" teachers for ten years, with one additional early-career teacher and another two due to begin within the next twelve months. However, there has been a high turnover of leaders – most notably, seven school principals in the last eight years.

In their project report, participants identified their pedagogical challenge as follows:

> Teachers' and students' roles will evolve together in a more personalised technology-rich environment… We will need to educate our parent community that creativity, innovation, communication and technology is the heart of the future of education and students will need to be equipped with the dispositions that will result in them being flexible, creative thinkers.

When asked about the challenges involved in achieving a more personalised, technology-rich environment for all learners, the principal articulated the strengths of several staff members. However, she also noted that there remained a tendency by some teachers to set "busy work":

> They're a very capable group of teachers. They understand and they're embedding some innovative practice… through the majority of the classes in the school…. there is a lot of team teaching technology with the librarian who has then worked with teachers as a professional learning type of scenario to embed some of these practices in and across the entire school. [But] there is still a way to go in terms of moving on, giving children a centre and a voice in their own learning and setting their own goals, there's still probably a little bit too much stencil work for my liking…

The participants visualised their project aims by co-creating an infographic representation of the intended pedagogies for their school community. As they explained in their report, "authentic real world tasks that utilise technology will have to be embedded into day-to-day classroom learning experiences to promote and ensure deep knowledge and understanding". As they further explained, the implementation of these tasks requires "a shift in skills that students will need, [which] therefore has to be reflected in current pedagogy in the classroom of today and the future".

Participants believed that authentic tasks were integral to their project for a range of reasons that many of them discussed. One teacher believed that these tasks were most suitable for developing "critical and creative skills", while another argued that children would be more engaged and develop skills more applicable to the future workplace.

All participants agreed that the shift from traditional to authentic tasks required a deeper focus on professional learning, with particular emphasis given to the links between theory and practice, the need for up skilling with technology and the use of technology to support and facilitate more active forms of professional learning. To achieve these professional learning objectives, participants had moved the focus in the school away from face-to-face staff meetings and towards the use of the online platform *iTunes U* to disseminate ideas and encourage dialogic discourse. As the principal noted:

> Why would we expect teachers to learn in a staffroom with one person disseminating information to the rest of the teachers at the end of full day of teaching, where they're exhausted. Giving them some professional autonomy, I suppose, where they can choose to learn using online tools, etc. So I think there's a lot of options with the use of technology, that pervasive technology, to be able to deliver things different.

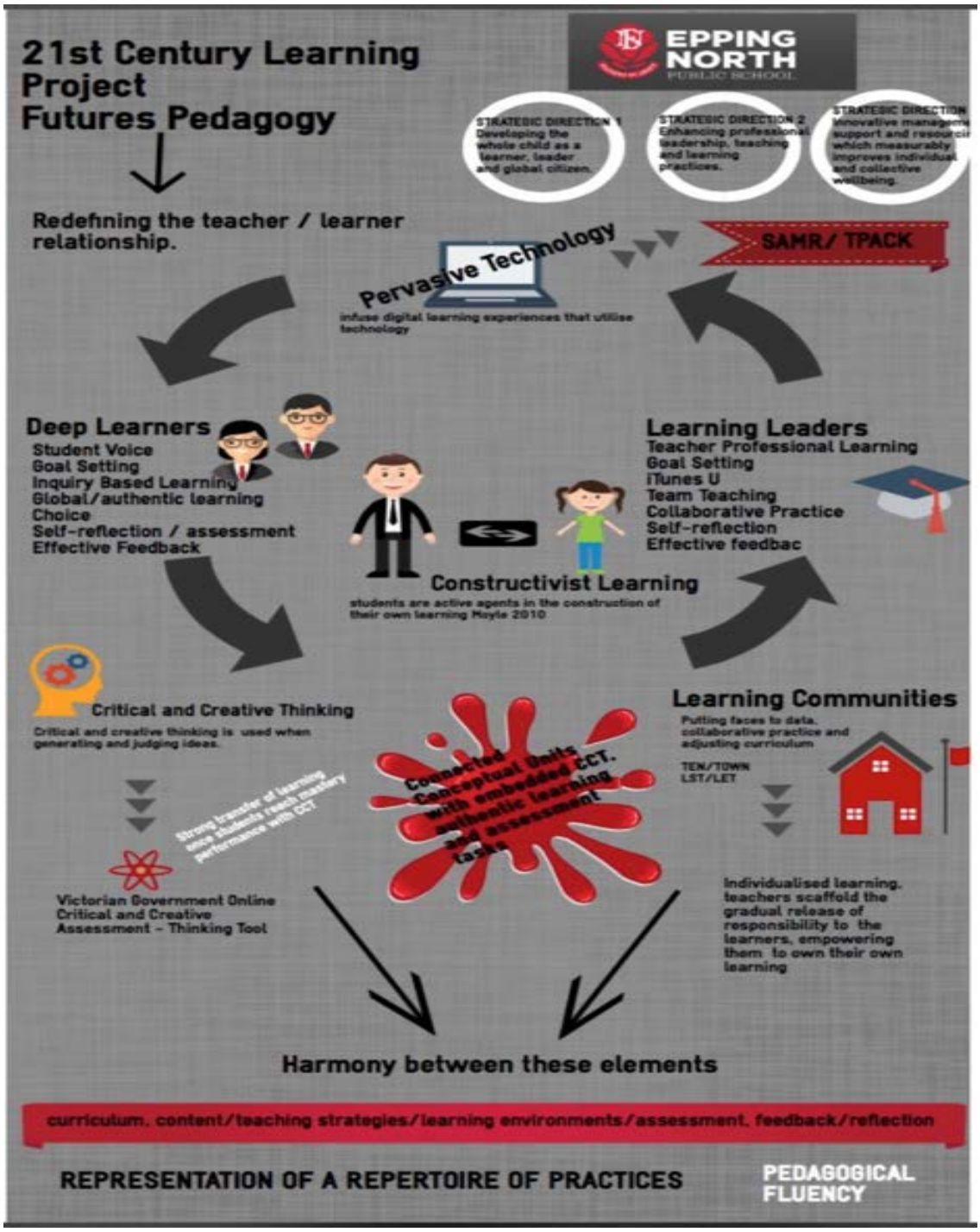

Figure 4.1 - Epping North infographic

The school's project plan articulated the intended outcomes of the processes that had been represented in the infographic. These were stated as follows:

> We hope to develop a harmony between curriculum, content, teaching strategies, learning environments, assessment, feedback and reflection. We want children to be active agents in the construction of their own learning. We want to engage our students, teachers,

> parents and the wider community in an innovative, equitable and effective public education system.

Ermington West Public School

Ermington Public School is an urban primary school, also located in the northwest suburbs of Sydney, catering for 481 students (225 girls; 256 boys) from Kindergarten to Year 6. 53% of the student body has a language background other than English; 10% are Indigenous. There is 15 teaching staff (13.9 FTE).

At the time of writing, the school had four teachers who were in their first three years of teaching alongside a larger cohort of very experienced teaching staff. The current principal, who commenced in 2014, acknowledged that the school community is undergoing considerable change:

> We've gone from [being] completely passive, "tell me what to do and I'll do it but I'm not really learning that much" [kind of school], across the board... entrenched practices, to a really big shift this year. So it's a growing enthusiastic bunch.

In their project plan, participants articulated cultural change and student-led learning as two key aims. Through involvement in the project, they sought:

> …to create a community with a shared future as successful learners, confident and creative individuals, and active and informed citizens. Student directed learning is a key pedagogical shift within this vision. At Ermington West Public School, we believe that affording students with the opportunity to discover and explore their passions is a necessary pedagogical challenge.

Describing the students in her community, the principal observed that "[t]he biggest thing that I've noticed is their inability to question". She stated that this lack of questioning was also shared by some of the teaching staff, who, she believed "need to ... to think a little bit more creatively about how things can be done… to take some risks… and open up the curriculum".

To achieve both cultural change and student-led learning, participants mapped their future work to three strategic direction phases in their school's report:

- *Strategic Direction 1 - Teachers as Lead Learners*
  To effectively build collective and individual capacity and place emphasis on ongoing, relevant and evidence-based learning and practice at an individual and collective level. To ensure there is strong leadership at all levels of the school that is capable, willing and actively working to shift thinking and practice. To further develop systems for professional learning focusing on the needs of teachers and ensuring a comprehensive approach to vertical and horizontal development.

- *Strategic Direction 2 - Partnerships in Learning*
  To engage all stakeholders so that the entire school community is informed, engaged and influential in the learning culture of the school. To build capacity within and across the school and with other educational settings. To develop partnerships with organisations and agencies which will allow the school to implement a balanced, dynamic and innovative curriculum. To involve all stakeholders in decision-making that is accountable, transparent and reflects local and systemic priorities.
- *Strategic Direction 3 - Students as Leaders and Learners*
  To create a genuine and powerful culture of learning and leadership that pervades the entire school and becomes a natural part of the way the school operates. To ensure that all students experience differentiation of learning experiences which allow them to become successful learners, confident and creative individuals, and active and informed citizens. To further develop opportunities for students to learn, practise and refine skills relative to leadership.

Through their work in these phases, the principal stated the final outcome in terms of students being able to demonstrate skills beyond passive learning: “one hundred percent of students with thinking skills in contextual, creative and critical ways”.

Evans River Community School

Evans River Community School is a rural K-12 school located on the far north coast of New South Wales. It has a student population of 499; including 254 girls and 245 boys. 14% of all students are Indigenous, and 2% have a language background other than English. There is 41 teaching staff (45.2 FTE).

In their school report, participants identified several pedagogy-related aims that included greater equity technology access across the school (and particularly for disadvantaged students), more consistency amongst all teaching staff in the use of technology, safely and appropriately using ICT for inquiry, and an emphasis on Inquiry-Based Learning across all Key Learning Areas (KLAs).

Early in the project, the principal conceded that the school had a considerable way to go in ensuring appropriate access to technology: “we start from a low base in terms of kids’ preparedness for learning, so kids at home, many of them don’t have technology, many of them don’t have internet access...some have their own devices but not many…”

The principal also identified professional learning as the key area of focus, and noted, “we’re looking at putting in place mentoring relationships and collaborative learning arrangements for staff to move forward”. He believed that these aims could be achieved through a four-stage process, summarised as follows:

1. Investigation by school leaders in the type and nature of professional technology-based learning required to address the needs of students at the school.
2. Development of scope and sequence documents that assist staff to focus on the skills students need to use ICT and work collaboratively.
3. Further investigation into what specified device (as part of a *Bring Your Own Designated Device*, or BYODD) students at the school need for their learning.
4. Development of capacity in all teaching staff and students to use ICT as for communication and collaboration to improve student outcomes through targeted professional learning programs.

Participants recognised that the move to BYODD required considerable planning. At the time of writing, the school received *equity funding* from the Department of Education, and school leaders were closely examining a range of devices in terms of their value for money. The principal was also exploring ways of using this funding for professional learning with the intended device. As one of the participants in the school team who had expertise in ICT observed, sustainable and continuous technology-based professional learning was needed in order to achieve project aims:

> I think our aim is... to try and put something in place whereby we are constantly up skilling our staff in the use of ICT and how it's going to support learning in the classroom… and knowing that that document or that continuum of learning for our staff is always going to be changing.

Jindabyne Central School

Jindabyne Central School caters for students from Kindergarten to Year 12 in the NSW Snowy Mountains region. At the time of writing, the student population was 681 (325 girls, 356 boys), of whom 1% is Indigenous and 7% have a language background other than English (LBOTE). There are 39 teachers at the school (49.8 FTE). Jindabyne has a seasonal, transient population for which staffing adjustments are made.

Through their involvement in the project, participants at Jindabyne sought to investigate ways to use ICT to enhance learning (particularly in the primary school and in the areas of Science and Mathematics) and engender a cultural change in the school wherein students would become "optimistic, resilient and confident lifelong learners who can; reflect, organise, collaborate, communicate, investigate, evaluate and think". Participants believed that the New South Wales Quality Teaching Framework (Department of Education & Training, New South Wales, 2003) represented the pedagogical dimensions that most closely aligned with the school's intended pedagogies. The principal reflected on the challenges and opportunities by underscoring teacher expectations and the need to challenge learners to take risks and solve problems in their learning:

> We have a very committed and focussed student body, but I believe that there's opportunity to challenge those students and to, I suppose, increase the standard and the

> level of expectation. My interest in this project was to...push the boundaries and challenge students to be better risk takers and problem solvers in terms of their own learning, but also to provide that opportunity for staff as well, to look critically at pedagogy within their classroom and to look at what other opportunities exist.

To achieve their aims, participants described a three-stage approach that involved: (1) improving learning outcomes in Science and Mathematics through authentic uses of ICT; (2) expanding the implementation of *Bring Your Own Device* (BYOD) across Kindergarten to Year 12; and (3) encouraging teachers' uses of ICT for higher order thinking, problem-solving and risk taking "in line with the *Quality Teaching Framework*".

As part of this three-stage approach, all teaching staff would select a unit of work to rework with more opportunities for problem solving, design thinking and the use of ICT to develop and share a product of their learning. Teaching staff would utilise "critical friends" to provide feedback for their colleagues, and time during staff meetings would be made to ensure that specific ICT tools could be explained, modelled and shared. Participants believed that these changes would engender the cultural shift that they sought through their project aims and involvement. The principal believed that baseline data participants had gathered on teachers' competencies with ICT and pedagogical practices:

> The most successful aspect of Jindabyne's plan has been the baseline data that we have gathered. We thought our school was further along in the journey of marrying technology, pedagogy and content in order to complete higher order tasks to enhance learning…we discovered that, despite there being pockets of teachers using technology to develop 21st century skills, the majority are using technology for lower order tasks, such as word processing.

Finally, the principal believed that her team's involvement in *Future Pedagogies* was an important step in facilitating further cross-school dialogue, especially between primary and secondary colleagues in the team: "we have found this project has enabled the team members to start a dialogue, K-12, about pedagogy. This will be the start of a journey of professional learning".

Manly Village Public School

Manly Village Public School is located in the tourist precinct of Sydney's beaches. It caters for 689 students (350 girls and 339 boys), of whom 29% have a language background other than English (LBOTE). There are currently no Indigenous students. The school has 32 teaching staff (35.4 FTE).

In their project plan, participants summarised their aim as "engaging all students in rich, personalised learning through fluid, innovative pedagogy that embeds digital technologies as effective learning tools". The report elaborated on this aim by drawing attention to the use of authenticity and creativity in learning tasks and better use of student-to-teacher feedback.

The principal observed that due to its expansion, the school had run out of learning space; hence there was a perceived need to explore mobile forms of learning such as fieldwork, outdoor learning and technology-based learning that was not tethered to traditional computer labs ("we shouldn't be relying on our place in the computer room every week in getting that technology to the classrooms").

In order to explore these areas further, the school team had investigated Design Thinking as a pedagogical model that could foster learner inquiry, creativity and sophisticated uses of ICT. They believed that this model could engender further creativity and enthusiasm among teaching staff. The report further stated:

> We aim to investigate ways we can embed the design-thinking model into learning experiences and programs- especially through inquiry based learning and/or when students are working technologically. As the project team, we aim to engage in learning about the model collaboratively, then embed it collaboratively before sharing our new knowledge with staff. We will then embed the model through an action learning and lesson study approach within our project team initially.

The team recognised that in order to share their ideas on Design Thinking, they "needed to differentiate the learning for teachers as much as we differentiate the learning for students". To this end, they sought to reconfigure the school-based structures for face-to-face professional learning so that it occurred in "action learning teams" rather than a single group.

The school plan summarised the intended outcomes of the team's work as follows:

> Through our Future Pedagogies project, we will have deepened student learning outcomes and further enhanced the engagement of our students by embedding the 6 Cs of deep learning (communication, citizenship, collaboration, critical thinking, creativity, character) into our learning and teaching programs. Students will have been involved in authentic, innovative opportunities to utilise digital technologies. Our staff will demonstrate greater confidence in implementing the Design Thinking model into their learning programs.

Nemingah Public School

Nemingah Public School is a small rural school in north-western New South Wales. It has a school population of 189 (81 girls and 108 boys), and a teaching staff of 11 (12.2 FTE). 4% of students are Indigenous and 2% have a language background other than English (LBOTE).

In their school's project plan, participants identified their aims as "fully integrating succinct learning goals in literacy units" and "using effective forms of feedback to improve learning outcomes". The principal elaborated on the role of feedback in teaching and learning by referring to the meta-analytical work of Hattie (2008) and suggesting that teachers could use feedback to better equip students to lead their own learning in pedagogically-informed ways:

> We're concentrating on feedback, that's where we're up to at the moment on that Visible Learning journey, so they all took, I found a pile of readings and examples, they all took components of it, studied it themselves and then presented it themselves on Staff Development Day, and you can see that it's really sparked off their learning as well, like, they're really keen to learn new things and improve their pedagogy.

To implement learning goals and feedback, participants identified three stages of development that included: (1) further professional learning in these two areas; (2) further use of "learning walks", where teachers would visit classrooms and ask students to reflect on their learning; and (3) further use of teacher-to-student feedback.

Throughout these three stages, the participants believed that the dissemination of ideas was integral to all teaching staff being able to employ learning goals and feedback in their classrooms. One participant stated that the "learning walks" provided teachers with an opportunity to observe one another's practice, thereby fostering collaborative professional learning:

> We try and work collaboratively and, you know, help each other and I think with the learning walks that's happening, you know, we allow, you know, all staff members to participate so they can see how it works too so it gives them more ideas and I suppose we're giving each other feedback and, you know, building on that and building on our strengths.

Through their involvement in *Future Pedagogies,* participants hoped to achieve, clear visible learning goals in every classroom, feedback from students that suggests that learning is student-led, improved literacy and better use of ICT amongst teaching staff.

Sarah Redfern High School

Sarah Redfern High School is an urban secondary school located in the south-western suburbs of Sydney. It has 475 students (232 girls and 243 boys), 10% of whom are Indigenous and 53% of whom have a language background other than English (LBOTE). The school has 35 teaching staff (48.4 FTE).

School leaders reported that Sarah Redfern High School had, at the time of writing, undergone considerable change over the past five years. Most recently, their focus has been to challenge very experienced teachers to employ a more diverse range of pedagogies in their teaching, and to utilise a wider range of technology tools to support and enhance learning. In their plan, they elaborated on this focus by underscoring continuous professional development (CPD), cultural change and further experimentation:

> The project goal is to design and implement an effective and sustainable model which focuses on the explicit and continual development of teaching practice across the whole school. Inherently, this model requires a culture change which fosters collaboration, experimentation and trust between teachers and the school's Leadership Team.

The project also referred to two pedagogical models they sought to employ further: first, the *4MAT* approach (Aktas & Bilgın, 2015) and Project-Based Learning, both of which would be developed across the school. One participant noted that these models were integral to achieving student engagement, relevant teaching and learning, and the development of skills that “will prepare them for succeeding at school and beyond”.

5. Research and project design

This chapter presents the research methodology and it includes the research questions and the approach to data analysis and also outlines the four stages of the project.

Methodology

In Stage 1 of the study, potential participants were invited to submit expressions of interest through responding to a questionnaire that examined pedagogy-related professional learning, decision-making and teaching practices within the school community. From these responses, an intensity sample of eight schools was identified for further investigation. In Stage 2, the study employed one-on-one interviews, school visits, classroom observations and school-based focus group interviews to examine how school leaders managed pedagogical change within their school communities. Stage 3 of the study involved participants engaging in face-to-face and online discussion to critically evaluate how their pedagogies address identified problems within, and meet the needs of, their school communities. Stage 4 provided the opportunity for the eight participant schools to showcase their projects to each other and to share their conclusions about their involvement and achievements.

This study addressed the following research questions:

1. What are the skills that enable teachers to employ pedagogies suited to the specific learners and learning context?
2. How can schools develop and draw on a common language for pedagogy to establish successful learning outcomes?
3. What are the necessary elements of pedagogical fluency and how can these be developed?
4. What role can contemporary technologies play in employing pedagogies for current and future learning needs?

The study was conducted over four stages that included participant orientation, project planning and progress meetings, school visits, and a final project showcase. Each of these four stages is explained in Table 5.1:

Table 5.1 - Project stage summary

Stage	Procedures and Methodology
1. Orientation *Oct-Dec 2014*	Expressions of interest are invited from all NSW DoE schools. Ethical approval for the study from both the Macquarie University Human Ethics Committee and DoE State Education Research Applications Process (SERAP) was obtained along with informed consent from all schools submitting an expression of interest. These data were analysed to select a smaller intensity sample of eight schools. Selection criteria included the: (1) level of leaders' interest in school-wide pedagogical change; (2) the range of problems identified in the school community; and (3) the background training and/or areas of expertise of participants and school demographics. One interview (via Adobe Connect) was conducted with each principal from successful schools in December, 2014.
2. Project planning and progress meetings *Feb 2015, Apr 2015 and Jun 2015*	Participants from selected schools attended two project planning and progress meetings to engage in initial and ongoing discussions about the contextual constraints that exist in their school communities and the pedagogical approaches they sought to develop and employ to address these specific problems. In Session 1, participants produced school-based project plans to formalise their approach in terms of strategic project goals and the use of allocated funds. Face-to-face interviews with each of the eight principals were also conducted at this time. Session 2 involved progress reporting in relation to each school's goals.
3. School context *Mar – Jun, 2015*	School based focus groups with classroom teachers were conducted establish key themes in relation to classroom the application of pedagogies being explored in each school community.
4. Project showcase, conclusion and final report *June, 2015*	During the final workshop, a focus group was conducted with all principals, where they were asked to discuss their progress in implementing pedagogical change through their involvement in the project. At the end of workshop day, all participants were invited to present in an afternoon project showcase open to the community. At the conclusion of their involvement in the project (June, 2015), participants completed an anonymous evaluation questionnaire in which the project as a whole and their own professional learning were evaluated. Project team analysed all data to produce the final report.

Datasets and Data Matrix

The data informing this study are drawn from semi structured one-on-one interviews, focus groups and an online questionnaire. All principals involved in the study participated in an introductory interview in December 2014. The purpose of this interview was to explore the interest of school leaders in the project and their intentions for creating pedagogical change in their school community. The questions invited principals to discuss their school's context, including the needs of learners, skills and interests of current teaching staff, contextual constraints, use of technology and key challenges moving forward. Principals then participated in a follow-up interview during the first workshop day in March, 2015. Questions in this interview focused on the role of leadership decisions and the contribution of leaders specifically involved in the project. These data were triangulated with input from classroom teachers during the school-based focus groups that were conducted between March and June, 2015. During these focus group sessions, all participating classroom teachers were asked to discuss their involvement in the project in response to a range questions that focused on the needs of learners in their context, their skills and interest in pedagogical models, approaches and other strategies, the use of technology, contextual constraints, and challenges moving forward. The final focus group with principals considered the key achievements realised through their involvement in the project and their beliefs about how the pedagogies in their community would evolve in the future. The initial and follow-up questions used in interviews and focus groups are included in the Appendices section of this report.

All interviews and focus groups were recorded, transcribed and analysed using *QSR NVivo*, Version 10. *NVivo* is a qualitative data analysis software package that enables researchers to closely examine data in many formats. Transcripts, audio files, spreadsheets, documents and photos can all be stored in, and accessed from, the program. *NVivo's* structure and operation enables researchers to identify common themes, link them across formats, and house them in one location for a more detailed examination. Table 5.2 summarises the datasets that were included in the study:

Table 5.2 - Summary of datasets

Instrument	Number of Uses / Responses	Length of Use	Total Dataset
December, 2014 Principal Interviews	8	Approx. 40 minutes	255 minutes
March, 2015 Principal Interviews	8	Approx. 20 minutes	140 minutes
School-based focus group with classroom teachers	11	Approx. 35 minutes	360 minutes
Final principal focus group	1	30 minutes	30 minutes
Final questionnaire	46	Approx. 20 minutes (11 questions)	46 responses

Table 5.3 shows the data matrix that informed the design and delivery of instrumentation in the study. This matrix also shows how instrumentation was employed throughout the four stages of the study (*Orientation*, *School Context*, *Project Planning and Progress Meetings* and *Project Conclusion*) to address each of the research questions:

Table 5.3 - Data matrix

Research Questions:	Orientation: Expressions of Interest	School Context: Interviews, school visits and school-based focus groups	Project Planning and Progress Meetings: *Interviews and principal focus group*	Project Conclusion: Questionnaire
What are the skills that enable teachers to employ pedagogies suited to the specific learners and learning context?	● General information on participants' background and training with pedagogies is provided. ● The EoI broadly describes the learners and learning context,	● Participants elaborate on their school context and specific needs of their learners. ● Participants identify the skills that underpin their pedagogies.	● Participants describe their learners and learning context and evaluate the pedagogies in their school community. ● Critical Friends feedback is provided to assist the development of school plans.	● Participants report on the development of specific skills identified during the project. ● Participants reflect on the current and future learning needs of their school community.
What elements in a common language for pedagogy do schools employ to establish successful learning outcomes?	● Participants identify pedagogies that are common amongst some, most or all teachers in their school community. ● Participants describe the aspects of these pedagogies that are most relevant.	● Classroom observations establish possible consistencies and inconsistencies in practice. ● Participants discuss how pedagogies are employed across the school through a common language.	● Participants discuss their school's pedagogies in terms of a common language within the school community. ● Similarities/differences between schools are explored.	● The questionnaire measures the extent to which the school employs a common language. ● Successful learning outcomes are identified.
What are the elements of pedagogical fluency and how can these be developed?	● The questionnaire measures the range of pedagogies employed by participants. ● Participants identify support structures needed to develop pedagogies further.	● Participants discuss the range of pedagogies they employ in their school community. ● Participants discuss support structures needed to develop pedagogies further.	● Participants discuss key "drivers" in their school community that demonstrate pedagogical fluency and discuss support structures needed for further development.	● "Best cases" that demonstrate pedagogical fluency are identified. ● Support structures moving forward are identified and discussed.
What role can contemporary technologies play in helping to develop	● Participants identify key technology tools used in their school community	● Participants discuss and/or demonstrate how key technology tools are employed	● Participants apply contemporary technologies to network with colleagues and	● Participants evaluate the effectiveness of current technology tools for enabling,

pedagogies for current and future learning needs?	and describe the relationship between these tools and teacher pedagogies.	as part of pedagogical approaches.	share their practices with pedagogical approaches.	facilitating and/or developing further pedagogies and/or pedagogical approaches.

Data Analysis

Interim analysis was applied during all stages of data collection. Following the completion of the initial December 2014 interviews, data from this stage of the study were explored inductively to identify broad themes and develop follow-up instrumentation for subsequent interviews and focus group sessions. Researchers also created an *a priori* category system (B. Johnson & Christensen, 2008) for subsequent segmenting and coding of all data. The coding structure was established through the use of nodes in NVivo, with each node representing segmented and coded data from the transcripts. Separate coding systems were developed for each dataset, with parent nodes that corresponded to the four main research questions in the study and child nodes that corresponded to the specific follow-up questions that were asked by the researchers. Due to the relatively small number of participating schools, researchers chose to employ a manual coding structure to enable closer analysis of the question responses and associated discussion.

All transcripts were added into NVivo in separate folders under the “Internals” folder with node sets for each of the datasets created in corresponding folders. Figure 5.1 shows the node structure that was employed for each of the initial and follow-up questions in the December, 2014 interviews with principals:

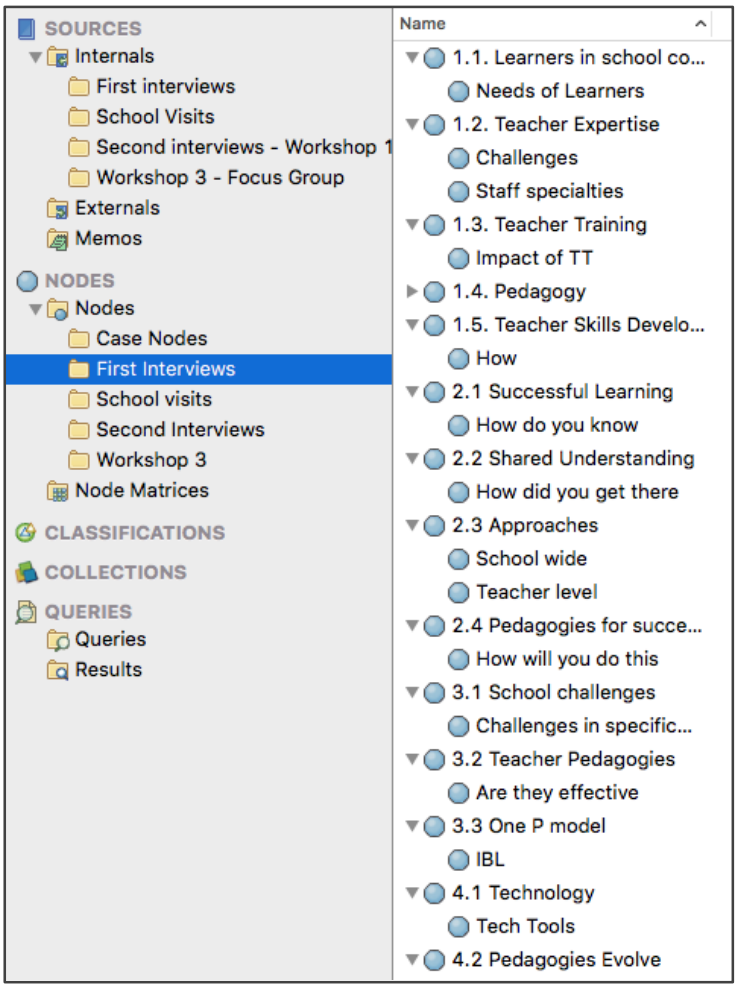

Figure 5.1 - QSR NVivo screenshot with coding (node) structure for December, 2014 interviews

As suggested in Figure 5.1, nodes facilitate the coding process and enable themes, patterns and semantic distinctions to be identified across the data. In terms of how they were used in data analysis for this study, each node included related material from the transcript that corresponded with initial questions, while each subnode included material that corresponded with follow-up questions. Node properties were arranged under the broader research questions and thus labelled accordingly.

Data condensation

Initial examination of datasets involved a literal analysis of coded themes. For example, identifying patterns in word usage, the regularity with which participants used particular phrases, the use of synonyms and the commonality of specific word trees, and the contexts in which they were used. These formed the basis for further examination of a common language and understanding of particular concepts.

Data interpretation

The next phase of analysis was interpretative. Organising the data into coded themes to develop a framework matrix enabled researchers to link themes and identify patterns. This method was chosen as it enables and supports a question-focused analysis, and identifies relationships between and within the themes.

Word and phrase frequencies

In addition to analysis of each individual transcript, word frequencies and related searches were employed to examine broader patterns across the datasets, including key words used by project participants during the interviews. First, documents of interview responses with interview questions removed were created on *Microsoft Excel* using the filter function by only selecting question responses (that is, excluding any dialogue from the interviewers in the analysis). Additional documents of interview responses were then created to represent relevant categories, including metropolitan teachers, metropolitan students, regional teachers, regional students, all principal interviews, all teacher interviews, primary school teachers, primary school principals, high school teachers, high school principals, community school principals, community school teachers.

Each individual interview response - as well as responses grouped by categories - was entered into a Word Frequency Query using *QSR NVivo* for single word frequency counts. Word clouds were also generated through this process.

The settings used to generate the word frequencies were as follows:

- **Display 400 most frequent words:** this was chosen as some keywords such as 'collaborative' appear in the 300-400th most frequent words.
- **With a minimum length of 4 characters:** (for example, includes 'kids')
- **Grouping with stemmed words:** the more expansive 'synonym' setting would have included some words that appeared to be unrelated e.g. 'learning' and 'teaching' would be grouped together while they may be quite discrete in meaning. The 'exact matches' setting would have been too restrictive.

Common words were removed so that word clouds contained only relevant key words representative of interviewees. A full list of removed words is available in Appendix 1.

While single word frequencies are a good indication of how frequently a word was used, it was acknowledged that these might not fully encapsulate key pedagogies discussed by principals and teachers. For example, principals and teachers commonly used "learning" in their responses, however, it could indicate a number of different ideas such as "inquiry-based learning" and "project-based learning". Therefore, phrase frequencies were analysed so the qualitative data analysis would be more comprehensive.

To generate the phrase frequencies, interview responses were grouped into relevant categories (including, for example, all of the principal interviews) and entered into *WriteWords Phrase Count*. This was repeated for phrase lengths of two-to-six words. As a number of the phrases that occurred more than once were not noun phrases and did not add meaning, for example, "those are" only phrases relevant to the research were selected. Items that were already covered by another phrase count were removed. For example, "creative thinking" was removed, as it was included in "critical and creative thinking". The remaining phrases with a frequency higher than two were then examined in *NVivo* to verify accuracy of frequencies using Text Queries and phrase contexts by examining sources.

Descriptive statistics

To generate the descriptive statistics, data from final evaluation survey (n=46) were analysed on *IBM SPSS*, Version 22. The name of one school and reclassification of five teacher roles were corrected, using the information on school structures inferred from the principal interviews. More information on the re-classification is in the *Active Profile of Participants* section of this report. Two teachers completed two survey submissions and one was removed and one was merged; thus, 44 complete responses remained. A school location variable was created to count the number of teachers from each region, as inferred from the names of the schools. The data were then used to generate histograms, bar graphs and box plots to represent age, role and region in *Microsoft Excel* and *SPSS*.

6. Professional learning program

The Principal (or nominated executive member) and three staff members from each school were required to attend three face-to-face full-day workshops throughout the duration of the project. The purpose of these workshops was to provide project information, updates and professional learning, to facilitate the sharing of project goals and progress, to conduct interviews and the focus group session with principals, and to answer any questions and provide support as appropriate.

Professional Learning

In recent years, it has been recognised that skills necessary for professional practice can be developed through "communities of practice" (Lave & Wenger, 1991, 1998). Building on Dewey's (1938) notions of knowledge acquired through social interaction, this kind of professional learning has, in turn, prompted a focus on "professional practice knowledge", a term used to describe knowledge developed through collegial interaction and shared reflective practice (Higgs, Titchen, & Neville, 2001; Kemmis, 2010). While some have argued that such knowledge can be developed and measured through appropriate pre-service and in-service training, others caution that this knowledge must be viewed in its broader social context. In particular, Kemmis (2005) regards professional practice knowledge as a "window into practice", but it is not the exclusive property of the individual who is reflecting. Citing Bourdieu and Foucault as two key theorists that show knowledge possesses aspects beyond an individual, Kemmis argues that we need to understand that the outcomes of reflective practice include "ideas about practice that are part of a shared social and discursive world with its own distinctive modes of structuration that exist 'outside' the heads of individual practitioners" (p. 402).

Among several of the schools involved, there was evidence of the recognition of professional practice knowledge being developed within shared communities of practice that the project helped to foster. For two metropolitan principals, this involved critical reflection on the individual teacher's professional practice and a willingness to share this with the community. At one of their schools, teachers realised, as the principal reported, "that that they actually need to be the drivers for the change. It's reaffirmed for them that the theory and practice links but then that professional responsibility is to lead some change with their colleagues". For the other principal, reflective practice involved looking honestly at "what we did in the past and how we can change", citing "the redefinition of the relationship between the teacher and student in the classroom" as the biggest concern for the teachers directly involved in the project. One of the regional principals admitted candidly that the reflective community of practice that she had encouraged for her team combined with learning about other schools through the networking opportunities in the project had led to "a bit of an awakening that we actually are not as far along the pathway of quality teaching and learning as we thought".

A recognition that shared social discourses shape professional learning outcomes further draws attention to the at-times stark contrast between school- and system-led changes. Such attention often leads to questions about the extent to which schools should be empowered to identify and address areas of weakness through more autonomous forms of professional learning. Caldwell and Spinks (2013) have recognised the need for collective ownership of change through shared management and greater autonomy for teachers and school leaders. They further highlight the failure of "top down initiatives" in leading to sustainable whole-school change:

> Experience of past top-down change programs or improvement scheme was one of dismal failure and it is therefore easy to see why the self-managing school is currently such a popular concept. The school effectiveness literature also shows that the more effective schools in all countries have staff groups who own their school because they as staff are responsible for its management and general wellbeing. It is also clear from the various school improvement programs that, commitment to personal and institutional change is greatest where the individual school is in charge of its own schemes (p. 32).

When designing the professional learning agenda for *Future Pedagogies*, the project team drew on this notion of the self-managed school and explored how school leaders could be better equipped to identify pedagogy-related issues from the literature and thus, develop their own targeted professional learning aims and outcomes where these and/or similar weaknesses existed in their school community. To this end - and to preserve the internal validity of the study - the project team refrained entirely from expressing their views about any pedagogy, potential school change, and what schools *should be doing*. Kemmis' (2005) notion of reflective practice knowledge was also employed to provide participants with the opportunity to interact, reflect and share their progress at key stages throughout the project and to allow them to articulate knowledge through a range of fora and discourses (including personally through one-to-one interviews, as part of a group in focus group sessions and to the general public and online community through the project showcase).

A number of more traditional instructor-led professional learning sessions were also conducted to assist participants with the planning and reporting requirements of the project, including instruction in the use of *Google Apps* for team and inter-team collaborating in the preparation of school reports, *Google Plus Communities* for the creation of a closed online community in which participants from all participant schools could communicate, share reports and comment on other's progress, and *Twitter* for promoting school progress to the wider, global education community. In general, these were based on similar courses that are regularly run at Macquarie ICT Innovations Centre (MacICT). During school visits to regional schools in New South Wales, MacICT instructors offered to run a short session on digital learning design that involved the use of Cloud-based tools on mobile devices. This course was intended to support the four regional schools, many of which were unable to regularly send teachers to larger metropolitan areas for professional development courses. In all four cases,

participants from each school elected to attend the training, which was conducted after the focus group sessions.

Finally, three keynote speakers were involved in *Future Pedagogies*, including Dr Kerry-Ann O'Sullivan (Chief Investigator and Senior Lecturer at Macquarie University), Judy O'Connell (Critical Friend and Senior Lecturer at Charles Sturt University), and Professor Lori Lockyer (Vincent Fairfax Family Foundation Chair in Teacher Education, Macquarie University). In the opening workshop, Dr Kerry-Ann O'Sullivan as Chief Investigator spoke about the purpose, aims and context for *Future Pedagogies*, and presented current educational research about pedagogy that included a thematic review of key pedagogical concepts and a focus on the intersection between pedagogy and the broader socio-political education issues affecting OECD countries. During Workshop 2, Judy O'Connell spoke about how pedagogy is being shaped by key technology trends, challenges and recent technological innovations. In Workshop 3, Professor Lori Lockyer joined both of these speakers to form a panel discussion on the themes and issues addressed and raised in the project.

Table 6.1 - Summary of workshop activities

Title and Focus	Date	Facilitator	Brief Description	Intended Outcomes
"Exploring Pedagogy in Current Educational Research"	Workshop 1	Kerry-Ann O'Sullivan	Keynote presentation on pedagogy and pedagogy-related issues in current educational research.	• Participants gain a broader understanding of the meaning of *pedagogies*. • Participants understand the purpose and context of the project.
"From Here to Here"	Workshop 1	Michael Stevenson	Simple group activity based on Cooperative Learning strategies (Kagan & Kagan, 1994)	• Allow participants to mingle and share their ideas about pedagogy in an informal setting.
School Report Planning (Google Docs)	Workshop 1	Cathie Howe and Michael Stevenson	Participants use Google Docs to access the report template, create, share and publish their school reports.	• Effective planning of school-based initiatives • Clear articulation of school goals for involvement in the project
"Introduction to Digital Learning Design"	During school visits (for regional schools only)	Cathie Howe and Michael Stevenson	Short presentation and activities to explore digital learning design based on current MacICT courses.	• Provide regional schools with further access to professional learning
Critical Friends Feedback on School Reports	Workshop 2	Cathie Howe and Michael Stevenson	Participants access school report drafts for other schools to provide critical friends feedback.	• Opportunity to share ideas for critical feedback and/or further development
"Word on the Tweet" - Introduction to Twitter for Professional Learning	Workshop 3	Cathie Howe	Participants explore the use of *Twitter* for cultivating Personal Learning Network and staying in touch after the project has concluded.	• Further promotion of school achievements and *Future Pedagogies* to the general community • Opportunity for participants to continue to network following the conclusion of the project

School Team Participation

In addition to their involvement in professional learning sessions, each school team was required to share important findings from their involvement in the project with others in their school community. For some of the schools involved, *Future Pedagogies* was limited to the small team of teachers involved (usually 3-5 participants). Other schools used the project as an opportunity to implement whole-school pedagogical change, incorporating their professional learning into a range of school-based fora such as staff meetings, release days and professional development days.

Regardless of the scale of their school's involvement, all school teams were required to further their involvement by:

- introducing the project and providing a rationale for why their school was involved;
- liaising with staff not directly involved in the project as appropriate;
- preparing school reports that outlined:
    - one pedagogy-related challenge;
    - the relevance of the challenge to the school community;
    - the processes involved in addressing this challenge;
    - a school project timeline; and
    - a proposed budget for expenditure of project funds;
- providing critical friend support by looking at other reports and providing commentary; and
- preparing for the project showcase presentation.

Showcase at Macquarie University - 4th June, 2015

The *Future Pedagogies Showcase* represented the culmination of each school's project-related activities during the research component. The showcase was underpinned by a key theme "Future Pedagogies - What's Your Vision?" so as to reflect the ideas the project team had been exploring in the workshops, interviews, school visits and data analysis. Approximately one hundred people attended the event, including project participants and their colleagues, other teachers and school executives from Department and non-Department schools, corporate staff from the Department of Education, and academic staff and preservice teachers from Macquarie University.

The showcase consisted of two sessions: (1) a panel discussion; and (2) presentations from each school. The panel discussion involved three experts on pedagogy: Dr Kerry-Ann O'Sullivan (Chief Investigator and Senior Lecturer at Macquarie University), Judy O'Connell (Key Speaker in Workshop 2 and Senior Lecturer at Charles Sturt University) and Professor Lori Lockyer (Vincent Fairfax Family Foundation Chair in Teacher Education, Macquarie University). The panellists discussed a range of issues that included challenges around

developing meaningful student-centred pedagogies as part of whole-school change, the need to explore more pedagogically-informed uses of Information and Communication Technologies (ICTs) and the relevance of current educators being connected through online communities of practice. Panellists also reflected on the need for a common language for talking about pedagogies and the importance of setting priorities for the development and implementation of future pedagogical goals.

Post Project Quotations from Participants

"[It was a] great opportunity to work with the executive staff, to have professional conversations and learn from each other"

"Personally I feel I have upskilled tremendously and my confidence in using technology has skyrocketed. It has changed my teaching practice for the better."

"It has been a fantastic experience to liaise with staff from other schools and share experiences, especially to hear their stories about their journey."

"From this experience I have been able to network and connect with larger groups of quality educational practitioners, broaden my knowledge, strengthen my skills and open my mind to new pedagogical practices."

"I have loved working with teachers across the Stages and developing my own understanding of the design thinking process. It's been great to see our students so highly engaged in their learning and collaborating and working in teams effectively. It's been really exciting to see where we started with this project and see where we are now in such a small space of time."

"Personally I appreciate the opportunity to link with other "like minded" schools."

"I have personally learnt a lot about different technologies to help enhance the work on Feedback at the school."

7. Project participation and expenditure

Profile of Active Participants

This section summarises descriptive statistical analysis of the active *Future Pedagogies* participants. It places particular emphasis on responses submitted (*n*=46) to the Project Evaluation Questionnaire (see Appendix 5).

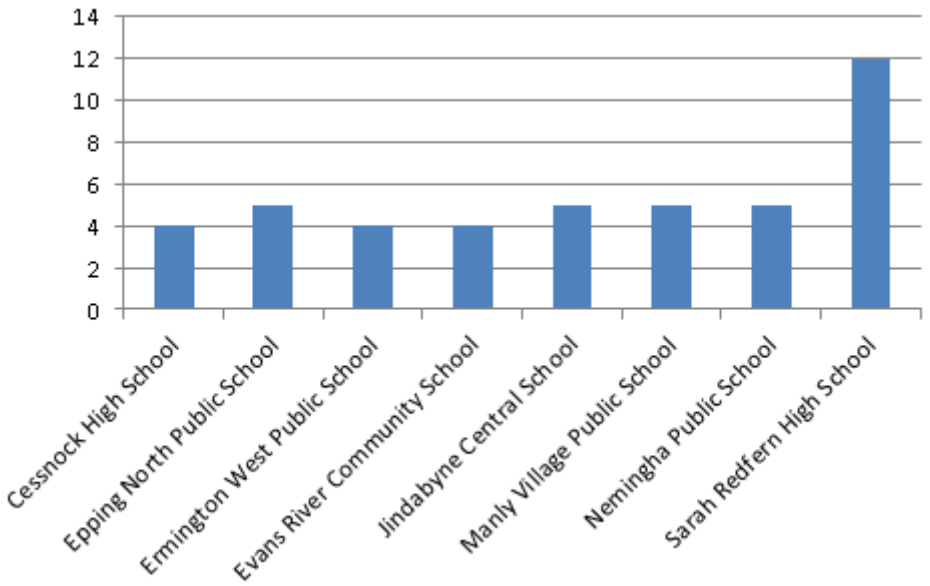

Figure 7.1 - Number of teachers who completed the survey from each school

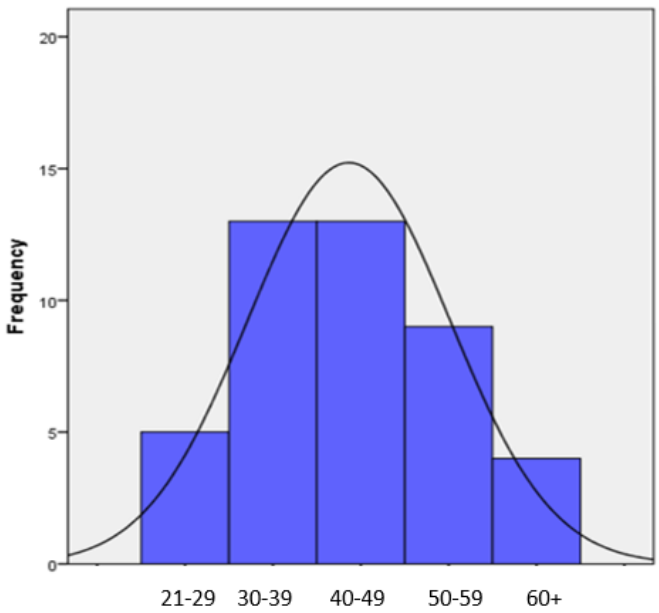

Figure 7.2 - Age distribution of participating teachers

At the conclusion of the project, we invited 52 staff from the participating schools to complete a survey to understand how the project challenged them and met their needs. A total of 46 responses were recorded. This section summarises the descriptive demographic data collected from the evaluation questionnaire.

On average, four to five teachers completed the survey from each school with the exception of one high school that had 13 evaluation questionnaire submissions. This strong involvement of teachers from a high school is reflective of the whole school approach adopted for the project. A total of 32 females and 12 male teachers completed the survey. The responses of primary (*n*=22) and secondary (*n*=21) teachers involved were roughly equal. One teacher who did not identify as primary or secondary was a deputy principal at a K-12 school. The distribution of staff by region indicated 59% of survey participants were from metropolitan schools (*n*=26) while 41% were from regional schools (*n*=18). This suggests staff from metropolitan schools may be slightly overrepresented in comparison to staff from regional schools in the findings.

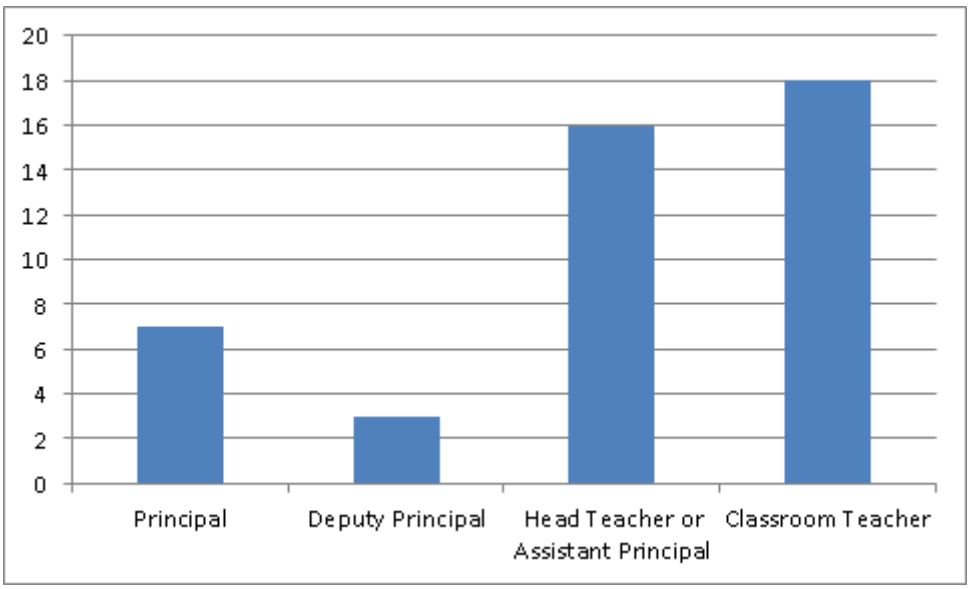

Figure 7.3 - Participants' identified role in their school

Participants by role

As Figure 7.4 indicates, a majority of participants (*n*=35, 77%) was current teaching staff at their schools ("Classroom Teacher" and "Head Teacher or Assistant Principal"). A large portion of these teachers nominated as having a Head Teacher or Assistant Principal leadership roles (*n*=14, 36% of total).

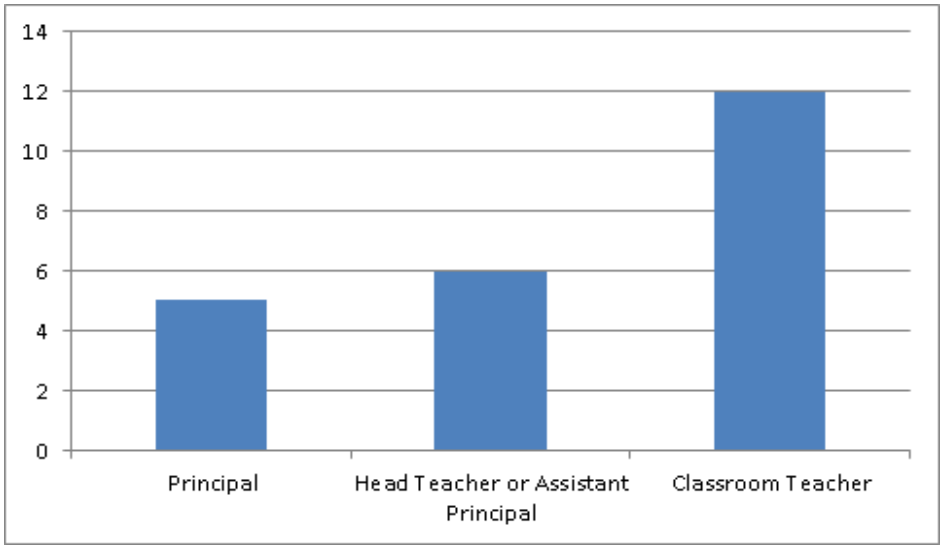

Figure 7.4 - Primary school participants by identified role

The distribution of the roles of the primary school teaching staff is illustrated above. Of the 23 primary school staff, fifteen of the 23 primary staff had a teaching load. The two teachers indicating an "other" role in the survey were an instructional leader and EALD teacher and were classified as a classroom teacher.

Figure 7.5 shows the distribution of roles among the participating secondary school participants:

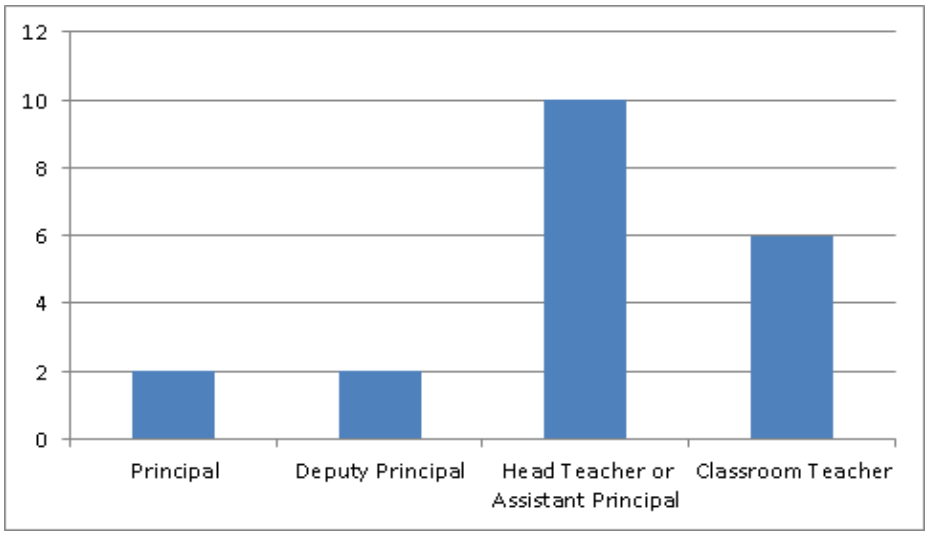

Figure 7.5 - High school teachers by identified role

At the time of writing, sixteen of these teachers had a teaching load. The three teachers indicating an "other" role in the questionnaire were a curriculum manager, business manager and manager strategic planning from a high school. This highlights their principal's initiative in using the *Local Schools, Local Decisions* (NSW Department of Education, 2011) scheme to create roles for teachers to suit their school context. More executive staff from high schools participated than primary and more primary classroom teachers participated than in high schools, though this may be a reflection of primary and secondary school structure.

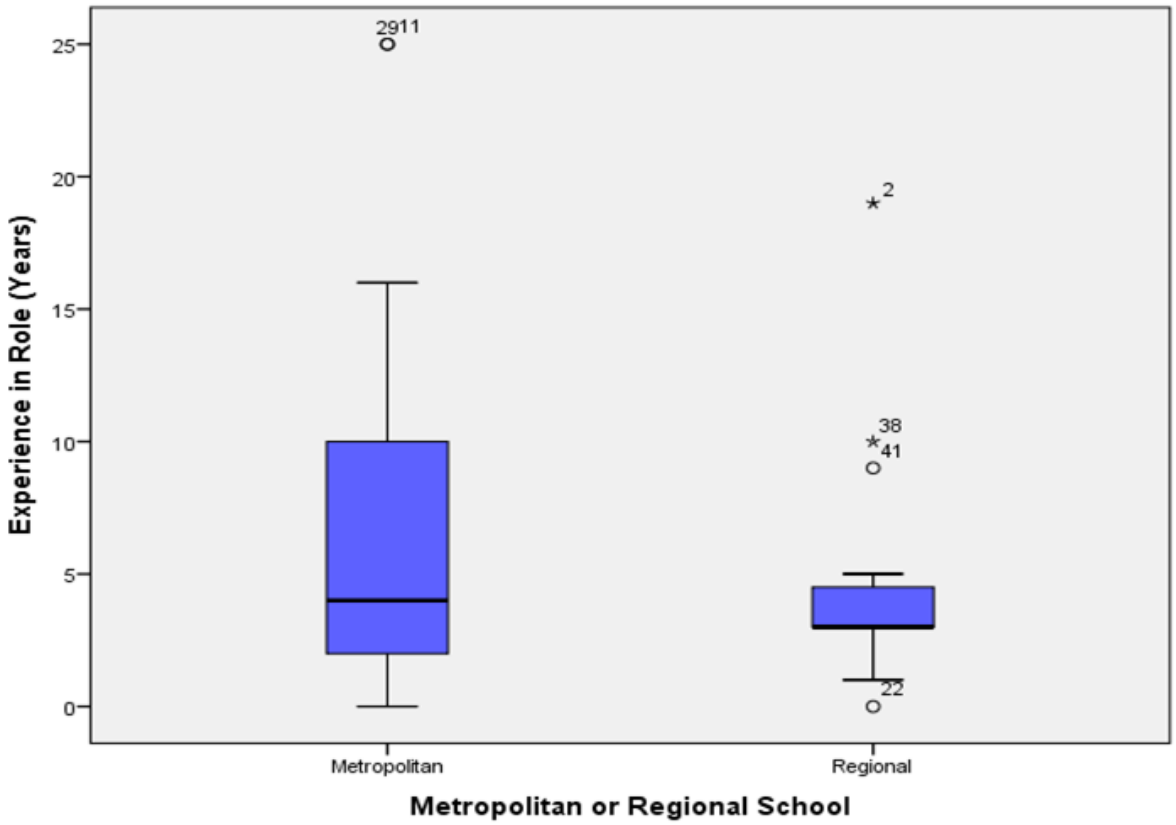

Figure 7.6 - Boxplot of the range of experience by school location

Figure 7.6 illustrates the distribution of years of experience in their current role by region, with the solid line indicating the median experience in years. The years of experience of metropolitan teachers (*M* = 6.50, SD = 6.776) were, on average, a little higher than regional teachers (*M* = 4.69, SD = 4.586). As the interviews were conducted in March and June – and since some of the participants were new to their role having only a few weeks of experience – researchers decided to indicate a participant's first year in their role as zero for consistency. Two teachers indicated to have less than a year of experience.

Teachers in metropolitan schools had a wider range of experience in their roles while regional teachers had a smaller range of experience with the exception of some very experienced teachers, indicated by the asterisks in the box plot above. The box and whiskers highlight the range or spread of experience of the teachers involved. It is interesting to note that the data

indicated a higher frequency of teachers with four years teaching experience in regional schools than metropolitan schools.

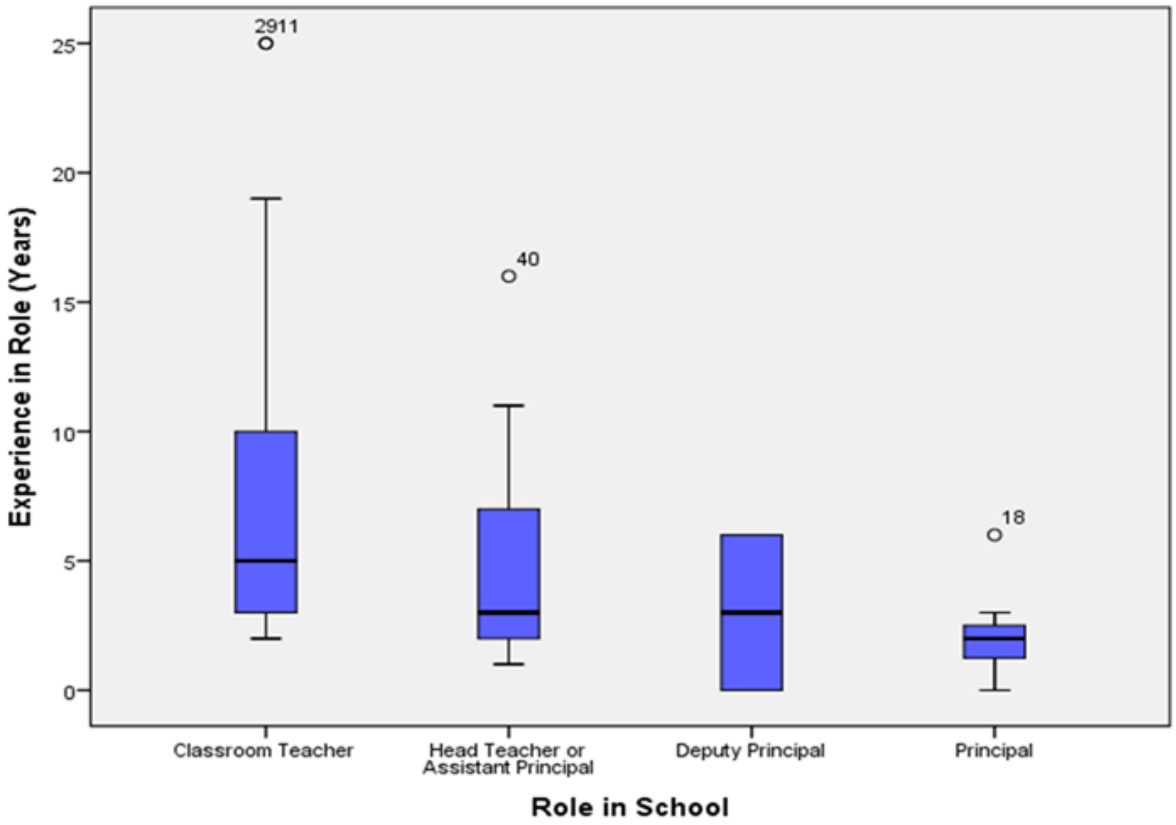

Figure 7.7 - Boxplot of participants' experience in their role

Figure 7.7 exhibits the experience (in years) of teachers in their respective roles. The spread of experience in teachers with leadership roles ("Head Teacher or Assistant Principal") is largest out of all the roles. It is important to note that only three participants with the role of Deputy Principal participated in the survey, and one did not indicate their experience in the role. Thus, the box plot for Deputy Principal should be interpreted with caution. Six principals of the eight participating schools had less than four years of experience in the role. 72% (*n*=13) of classroom teachers had less than ten years' experience. 44% (*n*=8) of classroom teachers and 79% (*n*=11) of teachers with leadership roles had less than 5 years of experience.

Expenditure Summary and Discussion

This section outlines the expenditure of the schools involved. Metropolitan schools (*n*=4) were allocated AU$5000 and regional schools (*n*=4) were allocated AU$8000 to cover costs associated with the project. A majority of schools elected to contribute school funds towards their project (*n*=7), thus total amounts reported ($82,347) may be higher than the total amount given to schools ($52,000). Schools were also informed at the start of the project in 2014 that allocated funding was not to be spent of physical infrastructure (for example, tablet

devices, Wi-Fi access points and teaching materials) and were encouraged to fund professional learning, release, travel and accommodation to suit the needs of the school.

Resources budgeted by schools were classified in by the following categories:

Table 7.1 - Spending categories and typical inclusions

Category	Inclusions
Travel and accommodation	Expenses required for attending the Future Pedagogies workshops and showcase at the conclusion of the project
Teacher release	Casual staff employed to relieve teachers to develop their project
Technology resources	Purchased technology items to facilitate and enhance learning i.e. software and hardware
Professional development	Money spent on teacher training
Specialist teacher	Employment of an additional staff member to oversee technology aspects of the project and the school
Other costs	Includes printing, stationery, administration and other miscellaneous costs

While each school focused their funding in different areas, a majority of schools used costs to release teachers for the project and this was where 49% of funding was spent. Proportionately fewer schools funded the purchase of extra technology resources, funding professional development and specialist teachers. However, it is important to note that this does not necessarily indicate that schools do not place importance in these areas.

Three schools used funds for formal training as part of professional learning. One school indicated funds were contributed to resources for teacher professional learning while another school each attended a digital conference with additional funds towards more professional learning. The remaining school attended the Inspire Innovate conference run by the New South Wales Department of Education.

Regional schools (*n*=4) had $3000 more funding than metropolitan schools and were the only schools that indicated costs for travel and accommodation. Two schools had used $3000 for their travel and accommodation expenses whilst one school used $1150 and another used $4000. Due to the location of the school that spent the most on travel and accommodation, researchers suspect the extra expenses were due to the extra transport costs. The school that

spent the least on travel and accommodation also did not use their own school funding for the project.

While all schools were informed from the outset to use funding in areas other than physical infrastructure, two schools purchased technology resources. One school had included some additional school funding to purchase a license for the education management software, Moodle. The other purchased unspecified software and hardware including "document cameras" and tablets.

Table 7.2 - Collective allocation of total project funds by area of expenditure

Area	Expenditure	Percentage of total funds	Number of schools spending in this area
Teacher Release	$44 550	54%	7
Travel & Accommodation	$11 177	14%	4
Professional Learning	$14 420	18%	3
Technology Resources	$5 650	7%	2
Specialist Teacher	$4 500	5%	1
Other Costs	$2 050	2%	2

8. Pedagogy, skills and the needs of learners

Research Question 1: What are the skills that enable teachers to employ pedagogies suited to the specific learners and learning context?

This section reports on the first research question and it explores the particular skills identified by principals and teachers that they saw as necessary to support the pedagogies required for their students so as to enhance learning within their specific school context.

The findings are presented below in four stages:

1. December 2014: Principals' pre-project interviews
2. March 2015: Individual Principal interviews at first workshop
3. April- May 2015: School visit teacher focus groups
4. June 2015: Principals' focus group interviews at final workshop

December 2014: Skills Principals Sought to Develop

In the December 2014 Pre-Project Interviews, each principal was asked to describe their school community with a focus on the needs of learners within their community and the expertise of their current staff in employing pedagogies to meet these needs. To examine the term *expertise*, principals were prompted to identify specific areas of strength amongst their staff, to refer to any recent training that teachers had undertaken to enhance their pedagogies, and to identify the skills they wanted to develop in their teachers and themselves through their involvement in the project. This interview served as an initial data point for exploring each principal's professional learning aims prior to the project's commencement.

Based upon data from these interviews, at this early stage, three dominant themes emerged:

1. The focus on skills development in the areas of creativity, lateral thinking, flexibility and risk-taking;
2. The need for autonomous professional learning beyond school- and system-led professional development; and
3. The belief amongst principals that the pedagogical expertise in each school needed to be enhanced to create change.

Each principal to varying degrees stated these themes, and in many ways they reflected the reasons behind a school's selection for inclusion in the project. The rationale and key findings for each of these three themes are discussed below.

Theme 1: The development of creativity, lateral thinking, flexibility and risk-taking.

Six principals identified the need to engender a positive attitude amongst their teachers towards the development of particular skills, and believed that their involvement in the project would, to some degree, enable or empower them to do so. The skills they desired are categorised broadly into three main areas that included creativity, lateral thinking and risk taking. The six principals perceived these three attributes to be important when seeking to enhance the pedagogies of teachers within their school communities. Researchers further noted that several principals privileged these specific skill capabilities over others, and that a teacher's capacity to think differently, to try new ideas and to avoid defaulting to "safer options" was integral to employing appropriate pedagogies to suit the needs of learners in their community.

One principal of a metropolitan school identified the importance of possessing open-mindedness, with a willingness to take risks as a starting point for changing pedagogical practices:

> In terms of skills, it probably is more of a mindset to start with, to think a little bit more creatively about how things can be done, not necessarily "this is what you have to do," or "this is what the structure is". [For example,] why do children have to be in those classroom groupings to start with? So let's look at our mindsets and be a little bit adventurous in taking some risks. I think would be pretty exciting…. the ability to connect kids with other schools, with other children across the world, so those more collaborative, open-ended environments that you can have with pedagogy.

The principal of another metropolitan school, who drew attention to the nexus between this attribute and improved applied knowledge in assessment practices, also identified risk-taking:

> … that my teachers are willing to take risks is really important, but also that, in taking those risks, they're also gaining skills in the ability to assess, observe, trace the evidence to say that the students are meeting their outcomes.

A third metropolitan school principal also considered assessment and the role that teachers can play in diversifying pedagogical strategies through creating high quality assessment tasks. They believed that the creative development of "rich tasks" designed for digital learning environments ("beyond pen and paper") was the best way to ensure that the strategies linked to the assessment were employed by all teaching staff. They conceded, however, that many of the teaching staff needed to improve their skills in creating these kinds of tasks.

A principal of a regional school also identified risk-taking as a core attribute in effective teaching, stating that the Australian Curriculum General Capability of *critical and creative thinking* needs to be applied to the work of teachers as they develop their pedagogical practice. They believed that secondary teachers' reliance on content delivery was at the cost of employing a more diverse range of strategies:

> Risk taking, problem solving and critical and creative thinking need to be our focus... particularly for secondary teachers, and I'm a secondary teacher myself. We often get caught up in the delivery of content, rather than thinking about the content as the vehicle to develop those critical and creative analytical skills and the challenge for students to take risks, and sometimes be wrong, but have that as a learning opportunity at every point, so that's what I want teachers to develop: the confidence and the skill level that enables them to provide some diverse but challenging teaching and learning experiences for students that isn't just content driven.

This principal further drew attention to the need for their teachers to "open their doors, learn together, reflect, refine and collaborate across stages and across schools… to enhance their pedagogical capacity". They had an aim for both staff and students to be extended through the teaching and learning processes.

Finally, a regional school principal focused on the need to challenge teacher inflexibility, suggesting that teachers in their school often go in "with their lesson planned… and they're quite rigid in their delivery". They believed that teachers who could move beyond more traditional teacher-centred direct instruction were able to draw on student input and thus redirect the lesson flexibly to meet the learners' needs.

Theme 2: The need for autonomous professional learning

Half of the principals interviewed at this early stage identified a need for pedagogy-related professional learning that was more teacher-led, self-managed and autonomous. In the literature, this is sometimes referred to as Continuous Professional Development (See, for example, DiMauro, 2000). Elsewhere, technology-based terms such as the Personal Learning Network (see, for example, Creelman, Ossiannilsson, & Uhlin, 2014) emphasise the role of technology in supporting more autonomous forms of professional learning. Stevenson, Hedberg, O'Sullivan and Howe (2015) have also examined the semantic distinction between professional *development* – which often implies the development of the teacher by the school, system or trainer – and professional *learning*, which implies the agency of the individual teacher and actions they undertake to learn professionally. Importantly for this study, each of these four principals believed that teachers were able to identify and learn about pedagogical approaches through professional learning outside of the traditional structures such as the staff meeting, one-day training course or network day.

A regional school principal argued that autonomous professional learning could be "sparked" by inspiring material, believing the research evidence in *Visible Learning* (Hattie, 2008) could play an important role in encouraging individual teachers to broaden their range of pedagogical strategies through teacher-led professional learning. They noted that since sharing resources such as PowerPoint slides and minutes from professional learning community meetings related to this research, amongst a small number of staff there was a "keenness to learn further". This principal believed with further support from the leadership

team that this keenness could be extended to all teaching staff throughout the school community.

While recognising the value of more autonomous forms of professional learning, other principals noted the challenges inherent in building capacity across the teaching staff for successful teacher-led professional learning throughout the school. A metropolitan school principal saw autonomous professional learning as confined to a relatively small portion of staff in their school, noting that further study requirements played a role in whether or not an individual educator was inclined to engage in autonomous professional learning:

> I'm doing my Masters and we have other teachers who are wanting to be certified educators so that is the path they are heading down. That is a small minority though, that's not, you know, I would love that to be able to sort of extend more and the focus not become so much on, I guess it becoming more autonomous and their professional learning being a little more authentic for them

This statement and the references to "inspiring material" at a regional school both draw attention to the importance of teachers having ongoing access to new ideas and research in professional learning. There appears to be a need for some sources of authority with suitable guidance for staff to continue their professional learning. For the metropolitan school principal, there was an acknowledgement that their Masters degree was essential for providing them exposure to new pedagogy-related ideas ("I've been doing my Masters so obviously I'm reading regularly and I share that with my executive and if I find an article that is really interesting I share that with them"). At the same time, this view underscores a more traditional view of the role of the principal as the disseminator of research in the school community.

Theme 3: The enhancement of pedagogical expertise for change

In other schools, the need to increase effective professional learning in order to build a larger base of pedagogy-related expertise among staff was reflected in the discussions around the key exponents of pedagogical change in the school. In several cases, it was evident that pedagogical expertise was limited to individuals and small groups rather than being demonstrated by all teachers in a particular school.

A regional school principal noted in relation to technology-based pedagogical expertise, "we have one guy, but we're losing him shortly". A metropolitan school principal stated that there were "a couple of shining stars that do a lot of the innovative practice" with pedagogies, admitting that most staff still required further learning. Another regional school principal pointed out that there were gaps in pedagogical expertise particularly evident in individual subject areas, with "one guy in Maths" who was able to move beyond relying on direct instruction in his teaching. A third regional school principal pointed out that there were "a number of teachers… experimenting with the flipped classroom" while athe principal of a metropolitan school recognised that a small "group of teachers" were starting to innovate

with literacy-based pedagogies such as *Accelerated Literacy* (See, for example, Jacobsen et al., 2002) and higher order questioning.

By contrast, there were limited references to a whole school teaching staff having competency in a diverse range of pedagogies, with the exception of one metropolitan school principal. As principal, they sought opportunities to regularly train all staff in new pedagogical approaches, most recently with *4MAT* training (Aktas & Bilgın, 2015) for all staff. The 4MAT model uses strategies within four distinct phases of the learning cycle: experiencing, conceptualising, applying and refining. They also implemented cross-Key Learning Area professional learning communities to explore how effective pedagogical practices in one subject area might be adapted and employed in another. While being able to describe the expertise that existed amongst all their staff as a result of the training they had received, they admitted that there was still further work to be done in ensuring that their teachers "further diversify their pedagogical strategies".

March, 2015: The role of leadership in the development of pedagogy

The one-on-one principal interviews conducted during the first workshop provided principals with a valuable opportunity to meet one another and to hear about each leadership team's aims as part of their school's involvement in *Future Pedagogies*. By this stage, each principal had introduced the project to selected colleagues and had begun to plan their school's project. As such, the data from these March interviews show an evolution in the discussion about pedagogies as a result of further time to think and plan and opportunities to receive input from school leaders both within and outside their communities. Interestingly, these factors seemed to have brought out a leadership focus in the interview responses, with principals to varying degrees, discussing their role in the project and how their leadership decisions shaped the professional learning of their colleagues. Principals were also asked to discuss the leaders with whom they worked for the purposes of this project. An early finding was that the school leaders in the project gained important reference points from working both with focused teams of leaders in their school and as part of a broader community of schools.

Based upon data from these interviews, at this stage, two notable themes were revealed:

1. The principals' perceptions of themselves as the leaders of learning within their school context;

and in a shift from some of the views expressed in the December interviews,

2. The identification of a particular teacher who was developing professional autonomy and driving change.

Theme 1: Principals' perceptions about leaders of learning

In the March interviews, several principals stated the important role that leaders play in enabling and supporting pedagogy-related knowledge and skills development in their staff. One regional school principal suggested that in their "traditional" school, each head teacher was largely responsible for directing the professional learning of their staff and determining which pedagogical strategies were employed in their subject area. They further conceded that such decisions were not necessarily based on evidence of best practice: "[In our school] if you had a strong head teacher, that faculty would run quite well, but it might not necessarily be run according to what might be considered best practice in other schools. It's done based on the skills of the head teacher and the experiences of the head teacher".

A principal of a metropolitan school explored leadership in a way that echoed some of the principals' earlier concerns in the December interviews, in terms of how good ideas and effective practice are shared across the whole staff:

> ...we're looking at leadership of pedagogy and how we can translate that from really knowledgeable expert teachers into our beginning teachers. Four of the teachers in my school are in their first years of their career, so we do a lot of mentoring and a lot of cross classroom practice, so [we're looking at] how we can extend knowledge and expertise, and really build that repertoire of teaching skills.

Another regional school principal defined leadership broadly, describing a style of leadership that is reflective of the concept of distributed leadership (see, for example, Harris, 2013). With a relatively new executive team and being new to the position of principal, they saw their role as identifying best practice amongst pockets of staff and using these staff members as leaders of learning: "...our work in terms of the leadership team has been on a stronger understanding around what effective teaching is and then aligning some professional learning to support the staff in terms of building their capacity, to be leaders of teaching and learning".

Significantly, it emerged that a third regional school principal had adopted a system leadership model and thus handed the leadership of the school's project involvement to their Assistant Principal. In contrast to the majority of principals that sought to find a balance between styles of leadership broadly described as "top down" and "bottom up" (see, for example, Fullan, 1994), this particular Assistant Principal believed that a top-down approach was what was needed. In this school the leadership had decided that the strategy of "learning goals" was central to the success of their initiative and the Assistant Principal described their aim of reaching a point where every student in the school could accurately answer the question: "what are you learning today?" When asked what pedagogical skills they wanted to develop further in their teachers, he responded:

> We've been looking at *Visible Thinking* [Hattie, 2008], trying to use visible learning and the implementation of learning goals into our classrooms. So we're pretty successful at that now. We started off with Maths and then moved into…we're moving into literacy at the

> moment so some of the teaching skills that I would like to see are the fact that that [process] will continue.

Theme 2: The identification of teacher autonomy

During the second round of interviews in March, one principal identified an example of teacher autonomy. The principal highlighted one staff member as a key driver of the project in the school, and as being someone who had "moved from professional development to professional learning, in that she takes on a role on her own to find out and resource". This particular staff member was also described to be "tech-savvy" and had a philosophy of "students as leaders and learners", both of which were incorporated in her teaching. The example signalled a move from the initial December interviews where attention was on the principal as leader of learning to reveal individual teacher professional autonomy was developing to drive pedagogical change within this school.

April-May, 2015: Teachers' perspectives on pedagogical skills

The school visit interviews provided a shift in focus from the principals to the teachers and represented an important data point for several reasons. First, since the interviews were conducted in each school setting, participants were able to show artefacts and more easily reference their pedagogies to the specific school context. Second, since the interviews were conducted in the absence of the principal, interview questions were more focused on the pedagogies of classroom teaching and less about the pedagogies of leadership (as had been the intention in the March interview data). Third, the interview data allowed for a triangulation of earlier findings; in particular, this attention on classroom teachers enabled the researchers to see in what ways the project aims stated by principals and other school leaders were being realised in practice. Fourth, the data reflected many of the contextual constraints influencing the classroom teachers' work, thus providing some indicators about the support structures that might need to be in place to achieve some pedagogical change within school communities.

These data were gathered mid-way into the project. While the sample did include classroom teachers that were also school leaders, not all of these interview participants had attended the workshops at Macquarie ICT Innovations Centre.

Based upon these interviews with the teachers in their own school contexts two key themes emerged:

1. Teachers tended to describe their pedagogies in technical terms and in relation to technology; and
2. Teachers identified a relationship between changing beliefs and changing pedagogies.

Most teachers addressed these issues, and in many ways these highlighted some important elements for consideration when bringing about changes in pedagogy within particular contextual circumstances. The main findings for each of these themes are discussed below.

Theme 1: Teachers and the tendency towards the "technical"

Many of the classroom teachers interviewed employed a range of different terms when discussing their pedagogies and when they attempted to describe their teaching practices. Among the teachers interviewed (*n*=41), there was a dominant emphasis on technology when discussing the strategies they employed - or aimed to employ - in their teaching. For several teachers, this involved the recognition that their use of ICT did not adequately inform their pedagogies, either in terms of improving their classroom practice or in enabling the pedagogies that they wanted to employ. In other words, these teachers did not feel that their pedagogies were adequately supported or enabled by their current uses of technology.

One head teacher conceded that all teachers in their subject area used technology largely to fit into their existing practice, with a particular emphasis on direct instruction as the dominant pedagogy they employed:

> ...my staff haven't done a lot of development in ICT so they are simply using their projectors and that sort of thing. So we're trying to do a bit of skills development in terms of interacting technology… My staff is very confident and focusing on reading activities for differentiation and that sort of thing. But we're kind of focussed on ICT, that's probably where our skills need to be developed.

Hearing this remark, a colleague explained that the best way to engage students in her Maths classroom was often without technology, to "take them away from the technology and actually set up an XYZ axis in the classroom with different coloured wool that they can actually move it [the axis] physically".

Another classroom teacher from a similar regional school admitted that her use of technology (as well as her colleagues' use in general) was not modelling best practice. In particular, she drew attention to some teachers' tendency to take resources from the Internet without acknowledgement: "We talk about it but we don't explicitly teach it to kids... or recognise it as adults. Like, you know, we all copy things from the Internet and just use it in something else and whatever else. So in terms of what we've currently done, in developing skills for teachers…" A teacher at another regional school shared her belief also, where ICT use was developing but where the staff felt that they needed to do more to position students as "twenty-first century learners".

Participants in all three rural schools - where the tendency to discuss pedagogies in "technical" terms was most apparent - readily cited contextual constraints that they felt impeded their use of technology in more pedagogically informed ways. These constraints commonly included limited access to the Internet, poor bandwidth, costly Internet access in

the homes of students, and limited technology expertise among staff. Of these concerns, the limited expertise was in part due to the school's remote location and the restricted availability of quality face-to-face professional development programs for teachers. When one researcher asked about the availability of online courses, one classroom teacher replied that these courses were far inferior to face-to-face professional development since they most often assumed that information could be "posted up online" with limited guidance and support from the instructors.

At a large metropolitan high school with very low SES, the teachers discussed technology in terms of their own missing skills that needed to be identified and targeted through cross-KLA planning and professional learning. At the time of writing, the teachers were working on improving ICT skills related to the visual and graphical representation of knowledge, regarded as "skills that our students are not coming developed with…" For several of these teachers, this discussion involved their admission that they needed further development in using ICT tools to visually/graphically represent information such as data, higher order thinking and conceptual links, but the teachers believed that the cross-KLA professional learning communities had provided substantial support with using these tools. This school employed a bring-your-own-device (BYOD) model of technology infrastructure, where students were allowed to bring devices that comprised a range of different platforms and software applications. The teachers at the school argued that the professional learning focus on exploring and using a wider range of tools for visual/graphical representation enabled them to assist their students to then demonstrate these skills using their BYOD device.

The emphasis on technology as a way of describing pedagogies is interesting in that it suggests that for some teachers, technology may play a diversionary role by focusing a teacher's attention away from exploring best practice as being *independent* to technology. However, the data may alternatively suggest that pedagogical practice in contemporary schools cannot be disconnected from the use of technology in one form or another. For many teachers, pedagogy and technology are closely intertwined; however, as these data show, some teachers recognise that technology in itself does not inform - or transform - teachers' pedagogies. The data from this school suggest that targeting skills and looking at a range of technologies that may support teachers' skills development might be an effective way to ensure that the tools of technology do not divert the focus away from effective pedagogies. A Habermassian emphasis on lower-order "technical" concerns (see, for example, Smith & Lovat, 2003) related to ICT usage may place teachers' attention on the use of actual tools rather than on developing their own pedagogy-related skills to integrate technology effectively and adaptively into their classroom practices.

Theme 2: Teachers and changing beliefs and changing pedagogies

In several of the participating schools among the classroom teachers interviewed there was evidence of the perceived value of changed beliefs in relation to pedagogical change. This

was similar to the phenomenon described by most principals in their December and March interviews. The consistency of this theme suggests that some school leaders and classroom teachers share the view that changed beliefs are important in relation to areas such as technology, professional learning, student centred teaching and the willingness to change practice. Researchers thus believe that a change in attitude, perspective or assumption in relation to one or more of these areas can be an effective predictor of change in pedagogies.

Teachers' beliefs are said to determine "almost everything one thinks about the business of teaching, the place of the school in society, most desired methods of teaching/learning and, finally, who should control curriculum and how it should be constructed" (Smith & Lovat, 1990, p. 71). When discussing the need for changed beliefs, teachers in these interview data referenced factors such as open-mindedness, greater collaboration with other teachers, a willingness to engage in teacher-student learning partnerships, ability to support the professional learning of colleagues and need to expand a teacher's professional learning network beyond the traditional contexts and confines of the school and system.

Teachers at a suburban high-SES school emphasised that their open-mindedness and willingness to collaborate with one another and with their students had led to the realisation that they no longer saw themselves as the sole "experts" in the classroom. As one teacher put it: "I think that's what I've actually personally enjoyed about this journey is that allowing the students to take the opportunity to be the expert and I'm the facilitator rather… the activator". In another regional school, the teachers' involvement in the project was itself an important pretext for collaboration between primary and secondary teachers - with this sort of collaboration being otherwise uncommon in this specific school context. For one primary and one secondary teacher, this collaboration involved developing teamwork skills and an improved shared knowledge of each teaching area.

Some teachers in a low-SES metropolitan school had undertaken costly inter-state training that had been instrumental in changing their perspectives on the potential of high quality formative assessment for implementing effective pedagogies in their school community. While only a small number of teachers was able to undertake this training, they regarded the ideas developed during the training as critical for understanding the pedagogies needed. Their primary concern was to "up skill" other colleagues in the school so that the teaching staff collectively had the necessary knowledge to proceed. Being relatively new in their use of formative assessment, the teachers interviewed nonetheless believed that this could develop the ability in students "to assess themselves, be critical thinkers and then be able to use the knowledge that they have to extend their own learning further".

For teachers in another metropolitan school, collaboration was an essential component in the largely autonomous professional learning undertaken to improve their pedagogical practices. One teacher regarded their learning as a steady process of "collaboratively building our practice as a school community". In a similar way to the other school, teachers here believed that formative assessment was the best approach to employ effective pedagogies in their

classrooms. However, they had decided to explore *Design Thinking* (see, for example, Brown & Wyatt, 2010) a relatively recent educational framework that emphasises a scaffolded and often project-based design process for demonstrating skills and knowledge in a real world context. Being a completely new area for the teachers in this school, one teacher with verbal support from the principal formed a professional learning community (PLC). She noted, "one of the main skills that we're developing [in our PLC] is being able to planning a learning sequence that is student-led".

Interestingly, this teacher and her colleague had substantially employed online Personal Learning Networks (PLNs) to build the skills and knowledge they needed for Design Thinking to be implemented in their school. Both teachers acknowledged that PLNs provided critical information they were unable to find in conventional school and system networks; most of the ideas they explored were from overseas educational contexts:

> We wanted to implement this [design thinking] and we wanted to do it together… [through] team teaching… and we saw a few ideas on some different blogs that we found through Google Plus Communities that there's this great teacher, I think she's in the States, that is doing a lot of design thinking and inquiry-based learning in her classroom. So we, kind of, stole her ideas and messed around with them a bit.

By contrast, teachers in a regional school with very limited support for face-to-face learning appeared less well-equipped to extend their learning beyond the traditional school and system contexts. One teacher admitted, "we work in a bubble," pointing out that the biggest challenge was "knowing what's out there and where we are at…" She further noted that their gaps in understanding made it difficult to accurately identify the knowledge and skills to be developed. Another teacher elaborated:

> We're very isolated as a school compared to other schools. We don't actually do much meeting together between us and other schools. There's not much collaboration between say maths teachers from different schools or science teachers. We don't have those kind of networks that we're involved in and because we're so physically distant from other schools, we don't collaborate in that way either. And a lot of the staff have been here for a long time or it's their first school so they're not exposed to different things in other schools either. So we're very unsure and we don't know what we don't know to a great degree or we don't see why what we're not doing is important. So an awareness of what's out there, an awareness of what's important is important for us to have.

It is recognised in the literature that a gulf exists between rural and urban school experiences for staff and students in Australia (see, Arnold, 2001; Green, Noone & Nolan, 2013) and one of the ways in which this is evident is in the limited professional learning opportunities available for regional educators (Sullivan, Perry & McConney, 2014).

June, 2015: Principals, pedagogies and project outcomes

During the final focus group interview with principals in June, each was asked to discuss the pedagogies that had been developed amongst their staff during the project period that were specifically related to their project goals. Three dominant themes emerged that reveal the principals' judgements about what was achieved and these provide some important implications about the work done in the schools. These themes are reported below:

1. The importance of professional learning for a change in pedagogical practice;
2. The need for greater networking and collaboration within and between schools; and
3. The role of leadership initiative in driving change.

Theme 1: Professional learning and changing pedagogies

Most principals acknowledged the importance of professional learning - both at the present time and for the future – to create a change in pedagogical practice within the school community. One principal believed, reflecting on the importance of scholarly readings in building their own understanding of pedagogies, this was primarily about "linking theory and practice". They described this as a continuous process of their teaching staff being able to draw on new ideas through theory and to implement them effectively in the classroom. For another principal, changing pedagogical practice involved teachers taking "more ownership of their professional learning". This principal had worked in a school where several junior teachers were driving their professional learning through networks beyond the school and educational system, while the majority of staff was reluctant to do so. In recognising the challenge of building capacity for autonomous professional learning across the teaching staff in their school community, this principal alluded to the need for more choice and flexibility in future professional learning opportunities.

The principals' comments on professional learning are significant in the context of the project as a whole. In terms of its overarching design, *Future Pedagogies* promoted school-based and context-specific professional learning, wherein leaders were free to determine how best to use the funding that they received as part of their involvement. It is further significant that a majority of the funds was spent in the area of teacher release from face-to-face teaching (RFF) ($44,550, or 54% of total project funds, spent by seven of the eight schools involved). Most participants acknowledged the importance of time in being able to learn and apply ideas needed to improve their pedagogical practice. For leaders, this involved drawing on the success of teachers that were able to learn autonomously, implement their learning in a classroom setting and appropriately support their colleagues. For a principal that indicated a greater sense of "ownership" in their teachers' professional learning, this meant a stronger sense of the agency, autonomy and responsibility created in the individual educator.

Theme 2: Networking and collaboration for school communities

For four of the principals, the focus group provided an opportunity to discuss the need for greater networking and collaboration both within and between school communities. One principal cited the affordances of current technology tools such as *Google Docs* and *Google Drive* for the collaborative planning that is advocated in the current K-10 syllabi for the Australian Curriculum. With access to these and similar tools, the principal argued that their teachers now have the means to "plan, program and produce things". In particular, several of their teachers had effectively used *Google Docs* to redesign units of work for the new national curriculum; while the tool streamlined the approach for all staff working on the same document, they felt it also created a greater sense of ownership with all of the staff involved feeling that they had contributed equally to the unit. The principal also argued that when effective collaboration is achieved, teachers are able to engage in higher order professional learning, with this form of learning more likely to be translated into their classroom contexts:

> With staff and students, we found that things were at a very low order so there is a real need for us to take a few steps back and recreate I suppose that pathway for professional learning so that we have consistent collaborative practices in terms of what we're aiming to do.

For the second principal, the opportunities to connect with the other participant schools and to share practice were key to the skills developed during the project. They cited the problem of schools sometimes "working in a bubble," where teachers were not "aware of what they don't know". By connecting with other schools, there were further opportunities to learn from these schools' successes and failures. The third principal agreed, further elaborating that collaboration and networking for them and their teachers chiefly led to "a bit of an awakening that we are actually not as far along the pathway of quality teaching and learning as we thought". Having seen what other schools had achieved through their involvement in the project, they now felt that their school had a much longer way to go in order to realise improved pedagogical practice in every classroom. Nonetheless, they recognised the value of the project in leading to this "awakening".

For the fourth principal, collaboration and networking involved more teachers in their school being able to embrace teacher-learner partnerships - what they described as "the redefinition of the relationship between the teacher and student in the classroom" - to the point where teachers could learn more freely from each other and their students. They acknowledged that this was difficult for some staff, but maintained that teacher-learner partnerships were an essential precursor for teachers being more agile in their professional learning. They further believed that the onus was on the teachers to account for their professional learning, seeing this as a process of: (1) identifying pedagogy-related skills they needed to address; (2) addressing them in their professional learning; and (3) providing evidence to the school that they had done so. They summarised this process in terms of the message they often told their teachers: "what you need to do is provide that evidence and if you're not [able to do so] that's

okay - we will provide the additional support". They maintained that the role of a good leader was to alternate between "challenging" and "supporting" their staff, while providing some assistance with every new pedagogy-related challenge that was presented in the school community.

Theme 3: Leadership initiative to create pedagogical change

The third theme - the role of leadership initiative in driving change - was reflected in two principals' recognition of value of *Future Pedagogies* in providing system-based support for school-wide pedagogical change. The first principal argued that the project provided the school executive with "a focus… to take that step further…" This principal recognised that having the support of a university, the educational system and an extended community of schools provided the needed impetus for making changes. The second principal expressed this initiative at the level of the individual teacher, suggesting that projects like *Future Pedagogies* could lead teachers to realise that "they need to be the drivers of [pedagogical] change". Drawing attention to the agency of the individual educator, the principal believed that autonomous teacher-led professional learning in relation to pedagogies could ultimately effect the most lasting changes to pedagogical practice in the school community.

While principals acknowledged a wide range of benefits of their school's involvement in the project, they also recognised some key pedagogy-related challenges in moving forward. Perhaps most significantly, several principals described the need for a more authentic practice that cut through the pedagogies "rhetoric". As one principal described, there was a need for greater alignment between what teachers *say* and *do*: "while they think they are doing it and they talk like they are doing it, the actual authentic look of it in the classroom is quite a different story". Another principal described the challenge ahead as teachers learning about new approaches but "going back to old habits".

For most principals in the focus group, there was recognition that meaningful and lasting pedagogical change required teachers to have a more diverse range of pedagogical strategies and approaches than was currently the case in each school community. Acknowledging the importance of projects like *Future Pedagogies* in helping teachers to become more aware of what colleagues within their school and other schools were doing, most principals discussed the need for greater "fluency".

As one principal described the challenge, "teachers need to know about the importance of pedagogical fluency… [for example,] when to use more explicit teaching, when to step back and let the students take ownership of the learning…" For their teachers, the teacher-learner partnership approach in the school also involved teachers knowing when to "let go" of strategies on which they often relied in favour of other strategies that their students indicated worked more effectively for them. As they indicated: "one of the big questions we've asked in our school is what good thing can we let go so that we can do something even better".

9. Forming a common language for pedagogies

Research Question 2: How can schools develop and draw on a common language for pedagogy to establish successful learning outcomes?

This section reports on the second research question and explores how the participants' language for describing pedagogies evolved throughout the project. In each of the interviews and focus group sessions, participants were asked: first, to describe teachers' understanding of *pedagogies* in their school context; and, second, to evaluate whether or not each teacher in the school had a shared understanding of the specific pedagogies that they sought to explore and implement through their involvement in the project. In the case of principals, these two questions served to identify how leadership decisions regarding pedagogical initiatives were understood and implemented by their teaching staff. In the case of classroom teachers, the questions helped the researchers to understand the ways in which the pedagogical intentions of the school leaders were being practically implemented in the classroom.

A discussion of research based attempts to build a common language for discussing pedagogy along with a review of the characteristics of some well known pedagogical models is presented first. Following this, the data from the two groups of participants – principals and teachers - are then presented below in separate reports.

The development of pedagogical models

Since pedagogies incorporate a range of methods, models and frameworks that can differ considerably from one context to another, forming a common language amongst educators is especially challenging. While being specific to context, pedagogy is also shaped by it, and is "strongly influenced by cultural perspectives on the objectives of schooling" (König, Blömeke, Paine, Schmidt, & Hsieh, 2011, p. 189). Nonetheless, as Lingard (2010) notes in relation to the vast body of research available, "we know that of all the school factors it is teachers' practices – their pedagogies and assessment practices (both formative and summative), which have the most effect on student learning" (p. 140).

Although contextual constraints may impede the development of effective pedagogies in many school contexts, there has been recent and renewed attention on the importance of developing a common language for pedagogies in Australia. From a global perspective many current national and state professional standards are linked to greater teacher accountability with increasing legislative regulation and a focus on external standardised testing (O'Sullivan,

2016), there is also a recognition of the importance of shared understandings about pedagogies as a key element for improving contemporary students' learning.

In Australia, this renewed focus has been informed by two large-scale studies in pedagogy. The first of these was the *Queensland School Reform Longitudinal Study* (QSRLS) (Lingard et al., 2001), which aimed to comprehensively explore pedagogy through a rigorous, staged design that incorporated classroom audits of teacher practice. As the first systematic review of pedagogies across almost one thousand Queensland primary and secondary schools, the study promoted *Productive Pedagogies*, a model conceptually based on the *Authentic Pedagogy* model in the United States (Newmann, Marks, & Gamoran, 1996). By positioning the study in a broader international context, the QSRLS aimed to establish a common language around pedagogy with findings that would be externally valid. It built upon the *Authentic Pedagogy* research by extending considerations to social as well as intellectual outcomes of schooling. As Ladwig (2007) explains, "the rapid interest in *Productive Pedagogy* could have been a response to an unmet need for a *common language* about teaching for educators to collectively focus on what is arguably the core business of schools: teaching" (p. 71, our emphasis).

The QSRLS findings informed the *Quality Teaching* (QT) framework, a model developed by Dr James Ladwig and Professor Jennifer Gore of the University of Newcastle. This was based on both QSRLS and *Authentic Pedagogy* and implemented by the Department of Education in New South Wales government schools during the early 2000s (Department of Education & Training, New South Wales, 2003). Similar to QSRLS, QT involved the development and use of instruments to measure pedagogy not only through direct classroom observations, but also through related activities such as lesson planning, programming and assessment. Unlike the QSRLS (which involved external observers), colleagues in schools usually conducted the observations. In order to promote the importance of re-thinking pedagogy across all participating schools, the model was theorised as having both "maximum impact" (avoiding the "we already do that" response) while having "maximum realism" (encouraging the "I can do that" response) (Ladwig, 2007, p. 73). QT also aimed to reflect the multidimensional nature of pedagogy by conceptualising three key areas: (1) intellectual quality; (2) quality learning environment; and (3) significance. Importantly, these three areas represent organising principles for educators across a large system to observe, reflect, discuss and evaluate pedagogical practice using a common language.

In stipulating key areas for empirical research, Quality Teaching aimed to build on both the strengths and weaknesses of QSRLS, especially in relation to "intellectual quality" and "significance," both of which emphasise the importance of pedagogies that promote meaningful connections, deep learning and constructivist approaches for students. At the same time, properly addressing these areas requires, as Curry and Light (2006) have argued, "the opportunity [for students] to exercise some control over what they learn and how they learn" (p. 9). While QT built on the work of QSRLS, exploring the importance of measuring the

effect of a wide range of pedagogical strategies, the authors of QT concede their analyses "measure pedagogy only by the quality of the assessment tasks, and do not include any measure of the quality of classroom teaching to which students were subjected" (Amosa, Ladwig, Griffiths, & Gore, 2007, p. 11).

Pedagogies in theory and practice: the search for a common language

Understanding the breadth and depth of teachers' work with pedagogies in the twenty-first century classroom remains a challenge. However, as Lingard et al (2003, p.401) assert the "core argument is that pedagogy should be recentred". Below is a report on the ways the participants in the *Future Pedagogies* project described their understandings of their pedagogies within their school contexts and the language they used to characterise their work as they implemented pedagogical changes in their classrooms. In this exploration of a common language for pedagogy, the data are grouped according to:

1. December 2014: Principals' pre-project interviews
2. March 2015: Individual Principal interviews at first workshop
3. April- May 2015: School visit teacher focus groups
4. June 2015: Principals' focus group interviews at final workshop

December, 2014: The Pedagogical Language of Principals

Figure 9.1 - Word cloud for December, 2014 interview data

In the early December 2014 interview data, most principals appeared honest and open about the perceived need for their teachers to have a shared understanding of pedagogies and identified some challenges around reaching this shared understanding. Broadly speaking, principals emphasised the importance of pedagogy-related achievements as group-based, collaborative, and community-oriented. Most principals saw less mentioned but nonetheless important concepts such as literacy, assessment, feedback, curriculum and technology as also integral for describing pedagogical change. Similarly, practices such as meeting, planning, and collaborating were seen as necessary for building a common language for improving teachers' pedagogies. Perhaps more than any other outcome, *student engagement* was regarded as evidence that a school had - or would, in the future - achieve improved pedagogical practice.

One metropolitan school was unique in having a core set of leaders that had worked in the school for over ten years, while at the same time having a high turnover of school principals. The current principal sought to work with school leaders to implement stronger teacher-learner partnerships, personalised and technology-enabled learning, and a greater focus on creativity and innovation for students to be "equipped with the dispositions that will result in them being flexible, creative thinkers". When asked if their staff had a shared understanding of these intentions, they reflected on their recent promotion to principal and their belief that teachers need to ensure that a newly employed pedagogical approach must be evaluated to ensure improved learning outcomes:

> I think they [my teaching staff] do have a shared understanding of what it looks like, but like myself I suppose, and I'm only just recently out of class, I could get it happening [improved practice] some of the time, but you couldn't get it happening all of the time… [My teachers] know what it looks like, they know what they want to do, and they're more than willing to do it… [As a classroom teacher,] my thing was always assessing that this different method of teaching actually improves their [the students'] outcomes, rather than doing it in a different way. I [still] have difficulty getting my head around [this challenge]…

A principal from another metropolitan school was particularly emphatic about the importance of a shared language for pedagogy amongst her teaching staff, likening this to a "shared sense of purpose". They stressed *improved learning outcomes* as the defining measure for newly implemented practice, while also alluding to the role of meetings as fora for staff to talk about their pedagogies:

> We've worked really hard to develop an updated shared vision for the school and we want a shared sense of purpose that we're all on the same page. I'd like to think that they do because it is certainly a message I have been trying to get out there and [it's been] the focus of our meetings. I have been very vocal about this, the focus of our meetings is about enhancing learning outcomes.

This principal cited their recent efforts to relegate administrative "busy work" to email communication as they argued that "three quarters of our meeting should be around student

learning and how we can enhance the learning outcome…" rather than "be bogged down with administration". They acknowledged that this was a "big shift" for staff.

A principal of regional school drew attention to the central role of whole-school professional development in enabling a common language for pedagogy. They stated that their teachers had "done lot of work around high standards, high expectations and the idea of personalised learning". This was qualified by their view that they needed to be further "challenged" in order to sustain their improvement.

For another regional school principal, professional development in Hattie's (2008) *Visible Thinking* represented a vehicle for facilitating a common language between all staff. Having trained teachers in some of the key findings of the researcher's meta-analysis of pedagogical strategies, the principal noted that "they all understand what an effect size is, so they understand the impact now because we have an assessment schedule and we use standardised testing across the school". The leadership team was currently involved in the task of producing "protocols for effective classroom observation" similar to those of the *Quality Teaching Framework*. Similarly, another regional school principal saw *pedagogy* as "where research and practice meet in the middle". While only beginning to explore evidence-based practice with their staff, they stated their intention to "bring research into our school plan" in the coming years.

March, 2015: The Development of Principals' Pedagogical Language

Figure 9.2 - Word cloud for March, 2015 interview data

The March 2015 interview data show some progression in the principals' and school leaders' language for discussing pedagogies. It is important to note that these data reflect the school's early involvement in *Future Pedagogies*. As such, principals had had four months to further formulate their intentions for the project and to develop their language for talking about pedagogies in the context of their school community. Some small shifts are reflected in the word cloud in Figure 9.2 when compared with the one in Figure 9.1. Words such as "differently", "change", "classroom", emerge more prominently although there is a degree of consistency across the two data sets. The word "pedagogical" and "interesting" appear for the first time in Figure 9.2.

Several principals were candid about the challenges they had faced during the initial stages of the project in forming a shared understanding of the pedagogies required to address the needs of learners in their community. As a very newly appointed principal in a low-SES rural school, one principal described the cultures of resistance they had faced when attempting to have discussions with teachers around the nature of pedagogies and pedagogical change:

> Yes, it's difficult [to achieve a shared understanding], and I suppose seeing I've been there [in my school] for three terms, it's hard to really work out whether I have. The way that I'm seeing at the moment is, when I started at the school, there was quite a bit of... no... I shouldn't have said "quite a bit". There was *some* resistance towards some of the things we were doing. Staff were saying, "we don't need to change, we don't need to change, we don't need to change".

A principal of a metropolitan school also faced resistance from their staff when attempting to introduce pedagogical change, qualifying that "there is a small group that I just think … are at that point in their career where they don't want to know about it". While arguing that they didn't have "absolute resistance" across the teaching staff, they conceded, "we do have some 'nodders' and not 'actors'", alluding to the idea that some staff were happy enough to discuss pedagogies but then did not enact the changes needed.

Another metropolitan school principal indicated that they had made substantial progress in focusing teachers on evidence-based pedagogies, echoing their earlier concerns about the need for new initiatives to be properly evaluated. To have staff engaging with relevant research and technology tools, they created an online *iTunes U* course with scholarly readings, other educational media such as podcasts and discussion fora questions for their teachers to provide their opinions. Having implemented these changes with particular respect to their involvement in the project, this principal argued that having evidence-based discussions around pedagogies was key to building a shared language while at the same time ensuring that the 'right' pedagogies were employed to suit the needs of learners in the school community:

> When people, I suppose, are using the same language ... I suppose if they're doing discussion posts or you're hearing it in the staffroom or you're seeing it in the classroom, and that they're in those learning communities, I suppose they're talking about it using a

> common language and a common approach and those sorts of things. People are actually opting in to go and look at other people's lessons and things; that's when you see you've got a shared understanding.

Speaking about progress made with staff surveys on pedagogy, an acting principal of a regional school discussed the results of a recent school-based survey that suggested a lack of understanding around the leaders' strategic directions. Amongst other things, the survey sought to examine whether or not a shared language for pedagogies existed in the school community. As the acting principal elaborated, "it [the results] came back [and indicated] that whilst teachers might understand what we're talking about; they don't really know where we're going with what we're talking about. So we've worked on that".

The principal of a metropolitan school drew attention to data that had been gathered since their appointment as principal five years previously. They maintained that their teachers continued to build a strong, shared understanding about the pedagogies needed for learners in the community, arguing that surveys and consultation were both key to achieving this shared understanding. Through ongoing consultation with parents and students and regular surveys about areas such as technology availability as well as preferred tools and ways to learn, this principal noted, "we've got evidence from where they're at to where they're going".

April-May, 2015: The Pedagogical Language of Classroom Teachers

Figure 9.3 - Word cloud for April-May, 2015 teacher focus group data

Data from the school visits and focus groups conducted during April and May reflect the pedagogical language of the classroom teachers involved in the study. As with the principal interviews, participants were asked to explain how project-related ideas were being shared and how their colleagues were responding to these ideas. These data provide insights on how classroom teachers articulate their pedagogies, both within and between school communities. The word cloud in Figure 9.3 identifies a stronger focus on relational aspects "kids", "teachers", "staff", and highlights "times", "different", and "skills" more obviously than the word clouds of the principals (see Figures 9.1 and 9.2).

Several themes emerged from the teachers' data including:

1. The role of collegial discussions in a variety of forms at different times in the teaching/learning cycle;
2. The need for hands-on applications of pedagogies in order to consolidate the teacher's pedagogical language; and

3. The need to address contextual factors that may impede the application and development of a teacher's pedagogical language.

Theme 1: Collegial discussions during the teaching/learning cycle

There was strong support for collegial discussion as a vehicle for sharing teachers' pedagogies as well as support for a range of fora wherein these discussions take place. These discussions assumed three main forms that included informal discussions, formal staff meetings within the school and formal meetings between schools (most often termed "network meetings"). In general, participants felt that collegial discussions provided an opportunity to exchange important aspects of pedagogical language with colleagues. In Secondary schools, these discussions took place both within, and outside of, the teacher's subject area, while in the Primary contexts these discussions took place both within, and outside of, the teacher's Stage of Learning.

Interestingly, the term "staff meeting" was often used in reference to mini-presentations, workshops and other forms of professional learning, rather than in reference to a traditional agenda-based discussion. In relation to mini-presentations, half of the project schools employed small "sharing sessions", in all four cases related to technology. At one regional school, teachers began every staff meeting with "two-minute technology tips" that were demonstrated to colleagues, with teachers thereafter making themselves available in informal pockets of time such as recess and lunch to provide further support. As one teacher remarked, "I've had at least one member of every faculty come and learn more about it [my recent 'tech tip'] and they're using it [the tool] across the school now. As [teaching] staff, we are open to change and learning new skills".

Similarly, teachers at a metropolitan described "share meet sessions" where "teachers bring different technology tools and share what they do with them with the rest of the staff". Staff at a regional school also noted the value of what they described as "five-minute tech bites" at the start of every whole-school meeting (with such meetings including both Primary and Secondary teachers). Finally, teachers at another metropolitan school also regularly shared ideas about the pedagogical use of technology tools in staff meetings; however, these were most often drawn from tools that students had identified and, on occasion, they taught teachers how to use. Elaborating further on their use of surveying to identify the technology tools that students are using, one teacher pointed out that survey findings were used to establish project-related groups for professional learning: "there is a survey done at the beginning of the year about what's working well, what needs to be addressed and crazy, big ideas. And out of those ideas come projects that are real concrete projects that we're grouped into, to have a product by the end of the year".

Teachers in six of the schools involved cited the use of workshops where they could undertake "hands on" learning with new pedagogical practices. In Secondary schools, these workshops involved planning and were often subject-based. Staff also conducted workshops, though

participants in the focus group emphasised the need for most of these workshops to be cross-KLA. The heavy emphasis on technology in these workshops coincided with the belief that technology was, in one teacher's words, "everyone's business". Another teacher acknowledged that this recognition represented an important change in the school's culture:

> Looking at the eLeaders we had in the past, which was a bit more, like, not everyone had to be part of that... you know [technology use limited to] small groups of people, so while I found that I learned a lot, not everyone had to do that [use the technology]. Now we've got everyone being part of it and… we are experiencing, you know, new things and learning new things in relation to ICT because we're all just part of it.

At two schools - both of which had Primary and Secondary teacher participants - there was recognition for workshops that included teachers from across the school as well as recognition for Stage-based Primary workshops and subject-based Secondary workshops. In the Mathematics subject area, teachers at one school conducted combined sharing sessions and hands-on workshops entitled "WWW - What Works Well," while also ensuring that project- and pedagogy-related ideas relevant to other subject areas were shared and explored in more depth in whole school staff meetings.

At another regional school, "pupil-free days" were often structured as professional learning workshops with a whole school session in the morning followed by afternoon sessions that were Stage and subject-based. Teachers found the combination of these types of workshops important for covering whole school issues such as Bring-Your-Own-Device (BYOD) while still allowing time for teachers to work within their specific curriculum area.

One metropolitan school was unique in requisitioning Release-from-Face-to-Face (RFF) time for pedagogy-related group discussions and workshops. The teachers acknowledged that this was a big shift from simply allowing teachers to spend RFF time as they saw appropriate. As one teacher observed:

> I think at first it was a shift because we were so used to [the idea that] 'this is my time'. So I think we had to get over [the idea and say], 'hold on a second - this is normally when I'm at my books or this is normally where I do RFF'. So I think that [shift] was an issue for some, but most of the staff - they've been pretty good and they can see what we're trying to do so they've taken that on board.

Classroom teachers at one regional school - most of whom were also leaders in varying capacities - stated the importance of both face-to-face and electronic communication. One teacher stated, "everyone relies a lot on email…. [For example,] if you find some research or you find something people are very open to share and flick it to different staff and say have a read of this, this is what we were discussing about this area". Of their staff meetings, teachers observed that the main emphasis was on sharing ideas within Stage-based groups.

Theme 2: Hands-on applications of pedagogies and the consolidation of pedagogical language

While recognising the value of sessions where teachers could present and share, most classroom teacher participants emphasised the importance of a "hands on" application of new ideas, many of which were also related to the pedagogical uses of current technology tools. In this respect, classroom teachers differed from principals, who tended to focus more on the connections between theory, research and practice while classroom teachers tended to omit theory and research in their discussions about pedagogy.

In general, teachers saw the application of ideas as an important next step for developing and articulating their pedagogical practice. One teacher at a metropolitan school described this next step as "further unpacking things" that were shared during collegial discussions while recognising among the project team members that "the four of us have all got completely different ideas". The leaders in her school had relegated RFF time to Stage-based meetings, and she observed that this time now enabled she and her colleagues to learn through "hands-on" activities rather than simply engaging in silent, individual planning.

Teachers at another metropolitan school described a similar phenomenon in reference to their exploration of Design Thinking. While they had not yet shared their ideas about this pedagogical approach with all staff members, they acknowledged the need for deeper learning on their part. As one teacher explained:

> What we really want to do is have that deeper understanding of the Design Thinking model before we go ahead and tell people, 'this is what we're doing'. This is how great it's going to be because we want to test it out first and see what we do well, what we need to improve on, as a group, I guess, first of all.

At a third metropolitan school, the team felt that a "professional learning session" was the best way to share the ideas from their involvement in the project. These sessions were described as "very hands on," with particular emphasis on encouraging all teachers to experiment and play with new technologies. Referring to the response of others outside the project team to these sessions, a participant observed:

> I think it's [their response to the sessions] generally positive and I think that it's about us [the project team] showing and supporting other people and also saying that it's okay that, you know, just have a go… to plan and do all those things that you would as a normal lesson and teach that way. But also let go [of preconceived ideas] and experiment and, you know, sometimes lessons can work really well and sometimes they don't - but don't let that put you off.

Teachers at one regional school also discussed the need for substantial, practical "hands on" workshops where teachers could learn through experimentation, play and guidance. However, they also referred to a more structured approach to running workshops, where following their training, teachers were required to create resources that would be

implemented in their classes. One teacher described these workshops as following a three-phase process for ensuring deeper learning of pedagogy-related ideas:

> So our three step process was [the leaders saying,] 'we're going to train you in these aspects in the continuum, then we're going to give you a chance to develop resources that will help you to teach it within the classroom, and then we'll have an implementation phase. And we're breaking that down with the different aspects in the continuum.' So it's a three-phase process.

At another regional school, there was a belief that the "learning walks" established by the project team were providing an informal opportunity to develop ideas by seeing how these were enacted in the classroom setting. The walks involved teachers, school leaders and visitors wandering through the school, entering classrooms and asking students, "what are you learning today?". Participants felt that these walks provided a valuable opportunity for informal pedagogy-based discussions where classroom teachers could share aspects of their pedagogy that were grounded in the specific classroom context in which they worked. Participants also noted that the school leaders felt that these learning walks fostered more collaboration between teachers:

> We try and work collaboratively and, you know, help each other and I think with the learning walks that's happening, you know, we allow, you know, all staff members to participate so they can see how it works too so it gives them more ideas and I suppose we're giving each other feedback and, you know, building on that and building on our strengths.

Theme 3: Contextual factors and the application and development of pedagogical language.

It is important to note that while classroom teachers were honest and open about the contextual challenges that existed in their school, the number of challenges cited that participants felt impeded the application and development of their language for pedagogies was relatively small in comparison to other contextual challenges noted elsewhere in this report. In broad terms the challenges identified here included the need for more time in order to apply and understand pedagogies in a teacher's classroom, the sense of being easily overwhelmed by new pedagogical language, and the perception that pedagogical changes represented "more work". Implicit in their discussion of these challenges was the teachers' views of the support structures in place within their school - or lack thereof - that could enable them to develop and apply their pedagogical language.

At one regional school, participants were particularly concerned about the need for time to implement any form of pedagogical change. This shared concern echoed earlier findings about the need for substantial "hands on" applications of new ideas, and the belief that sharing information by itself would not enable a collective understanding of the pedagogies needed in the school community. By extension, one teacher observed that a lack of time for

focusing on pedagogies meant that he and his colleagues often felt they were "drowning" when presented with new ideas in staff meetings:

> I think time is an issue because people get up and they talk about these wonderful things we could use or we could do but that's it, there's no further from that and we don't… we might go [say,] 'that's fantastic, we'd love someone to show me a bit more about that.' But we're drowning, so we're not going to go and seek out that person and say can you show me how to do it because that person is drowning as well.

Concerns about time and the particular sense of being overwhelmed were also shared by the staff at another regional school, where the project team admitted that they carefully sought to share only a few key ideas in order to "keep things not too dramatic" when working with those outside of the project team. At one of the metropolitan schools, the project team was also conscious of the issues that they might encounter when introducing too many new ideas thus resulting in other teachers feeling overwhelmed. They believed that the best way to avoid this was to be fully immersed in Design Thinking and to develop clear examples, resources and assessment to then present to staff. They believed that by ensuring that this thinking and planning work took place prior to presenting their ideas, others outside the project team would "be more receptive to it [Design Thinking] and see that it's not something additional".

Teachers at another metropolitan school recognised school-to-parent communication around pedagogy as a particular challenge for them to address in the future. As one teacher noted, this challenge was akin to "educating" parents about the pedagogies needed in the school community so that they could be better stakeholders in future:

> I think it's a change [parents becoming more involved in school-based pedagogies], like the change in the way that people approach their teaching and I think we probably need, in some respect, to get that message [the importance of good pedagogies] across to parents still. Like there is a change from what skills were needed when they were at school to what [skills] their children need now.

Finally, teachers at a regional school cited physical distance from other schools and professional learning as challenges for them to address when developing their language for pedagogies. One teacher observed that this, combined with a low turnover of staff, meant that many teachers in the school were unaware of newer pedagogical changes in the broader educational landscape:

> We don't have those kind of networks that we're involved in and because we're so physically distant from other schools, we don't collaborate in that way either. And a lot of the staff have been here for a long time or it's their first school so they're not exposed to different things in other schools either. So we're very unsure and we don't know what we don't know to a great degree or we don't see why what we're not doing is important.

Rural isolation that offers limited opportunities for professional engagement within the region is another contextual factor that may impede the development of teachers' pedagogical language and the promotion of changes in practice.

June, 2015 Findings: Principals' reflections on the language for pedagogies

Figure 9.4 - Word cloud for June, 2015 principal focus group data

The final principal focus group is significant in that it reflects views about each leader's participation and evolution of thought over the course of the project. In particular, as principals reflected on their school's achievements, they were asked to describe: firstly, how they had shared their project-related ideas with teachers outside of the project team; and, secondly, how teachers had responded to these ideas. The final word cloud in Figure 9.4 reveals a more evenly spread and balanced set of words with "think" for the first time being foregrounded along with "practice", "got", "see" and "know" emerging more obviously now.

In relation to the first question, a number of principals discussed the professional learning support structures they had put in place in order to ensure that teaching staff built a common language around pedagogies. Two principals of metropolitan schools discussed their use of technology for more personalised professional learning, believing it was important for staff to identify and address their own areas of weakness. One tried to ensure that some pedagogy-related professional learning offered in the school was choice-based, and that "staff could decide which thing they want to find out more about and go to the person who is providing that". The second principal's *iTunes U* course for their teachers had, in their view, proven both successful and popular. Referring to the use of *Google Docs* and scholarly readings, they

described their staff engaging with the reading while “annotating off to the side [of the document] about their classroom practice”.

Listening to these two principals discuss their use of technology for professional learning, a principal of a regional school conceded, “we haven’t really been using technology to communicate... amongst the teachers - but we’re starting to delve into that”. Similarly, another metropolitan school principal also admitted that they were still in the early stages of sharing ideas from the leadership team to all classroom teachers. They had formed a deliberately small project team to ensure that the ideas could be fully developed before sharing them with other staff members:

> We’re just harnessing the excitement because our team has been talking about what they’re doing, team teaching together. And other staff are really seeing that they’re excited about what’s happening within their classrooms so we’re going to use that excitement to then grow it throughout the rest of the year. So it’s…for us it’s been about our learning and how we can really reflect on our practice and improve it. And the next step is now to grow it for all the staff.

Reflecting on her own role in building a shared understanding and about the specific role of ICT, one principal of a metropolitan school remarked, “as the principal, I have to be a role model… In some cases, it’s been really hard, but I have had to demonstrate when I’m doing presentations to them I have to show them that I’m using ICT”.

In consideration of the second question, principals generally agreed that their staffs were responding well to new ideas about pedagogies that they had introduced through their involvement in the project. At the same time, five principals acknowledged that there were inherent challenges in ensuring that staff would take the ideas on board and translate them into classroom practice. For example, one principal of a metropolitan school implied that their staff felt overloaded with the current “educational landscape… and all the reforms that are coming in”. They observed that one of their key concerns as principal was being able to strategically introduce new ideas that align with key reforms, “so that staff can see the big picture”. As they further commented, “it’s still going to be a little bit confronting [to my staff] because we’re asking them to look at their practice“.

One principal of a regional school likened their leaders’ teamwork in the project as “developing a bit of a structure and pathway” for other teaching staff not directly involved in the project. Key to this was the time spent between leaders during drives between their remote school and Macquarie University: “all of the conversations that we’ve had with the team on the drive to and from have been really good professional conversations”. In furthering the work of the leadership team, they believed there was a need “to make a clear pathway before we actually make connections with other teachers so that it is successful”, suggesting that their achievements to date were “just the tip of the iceberg”. A metropolitan school principal likened the work of their leaders as building “ownership” in their school’s initiative. Again drawing attention to the small size of the school, they observed, “it’s easier

for us to get the ownership because we've got more of that personal relationship [with our staff]".

The findings from data sets highlight the importance of time spent talking and sharing amongst colleagues and the value of having conversations about pedagogy and educational developments drawn from research bases. Time is also crucial for teachers to experiment with and practise the applications of new technologies while also developing the pedagogies to effectively implement new ideas and changes into their classrooms. Finally, each school community has a range of contextual factors that will support or impede the processes of pedagogical change. Opportunities for professional learning, individual development and cross-school exchanges can enhance the development of teachers' shared understandings and build a common language around pedagogy.

10. Exploring pedagogical fluency

Research Question 3: What are the necessary elements of pedagogical fluency and how can these be developed?

A consideration of pedagogies

An emphasis on *pedagogies* as "multiple methods" with no singular approach favoured suggests there is a need for fluency across a wider range of pedagogies and it highlights the importance of using evidence when selecting and justifying pedagogical strategies, frameworks or approaches so as to suit the needs of learners and the school community. As a concept, *pedagogical fluency* has been used sparingly in the literature, most recently in reference to areas such as technology integration (Ferris & Wilder, 2013) and preservice teacher training (Garza, Duchaine, Reynosa, Hobson, & Hobson, 2014). However, models such as the TPaCK (Koehler & Mishra, 2009) illustrate the importance of pedagogical fluency as educators are encouraged to examine pedagogy in relation to both technology and discipline content. This model further suggests that in order for pedagogical fluency to be realised, general pedagogical knowledge (GPK) needs to be adapted to other forms such as pedagogical content knowledge (PCK) and technological pedagogical knowledge (TPK).

Hamilton (2009, p.14) reminds us "each pedagogy is designed to lead, channel or steer learners in a particular direction". It is important, therefore, to have a clear rationale for the specific choice of any pedagogy. Drawing on a rich research field of pedagogical content knowledge (PCK) and evidence-based practice, Shulman (2005) cautions that any evidence of improved learning outcomes related to pedagogy must also be subjected to close scrutiny:

> Evidence informs and enlightens decision-making; it does not bypass the need for interpretation and judgment. It's unrealistic to expect that educational research will regularly be conducted by those who have absolutely no stake in the outcomes. Education is not, and never will be, a values-free zone. Nevertheless, we need ways to review research findings, evaluate the evidence, consider the values inherent in the situation, and render judgments that our citizenry can trust (np.).

While many accept that empirical research findings can be used to justify particular pedagogical approaches, others – including advocates of action research – suggest that evidence can also be produced iteratively when exploring approaches for the first time and then using the findings to inform leadership decisions (see, for example, Glanz, 2014). Such arguments are especially relevant when selecting specific technology tools for which no prior evidential base exists.

The importance of clearly identifying and targeting areas of weakness when seeking to improve pedagogy and to draw upon evidence to do so is recognised in current policy and

research in school reform. For example, the authors of the New South Wales policy document, *Great Teaching, Inspired Learning,* believe that evidence will play a powerful role in teacher quality in the years to come – that, "the quality of the teaching workforce in NSW will be informed by a strong evidence base" (Department of Education & Communities, New South Wales, 2013, p. 10). The same report calls for "greater recognition [shown] to school-based, classroom-focused professional learning", drawing attention to the decisions of school leaders and classroom teachers in furthering their professional learning to meet the specific challenges that exist in their communities (p. 16).

Integral to these calls is the need to leverage professional learning to address specific problems so that teachers become active participants in the development of their pedagogical repertoires and pedagogical fluency. As one of the exponents behind *Authentic Pedagogies*, Newmann (1996) points out that school leaders should be active in working out the problems as "the state of affairs" in the school:

> Many models of organisational change suggest a crucial step is some form of information gathering or research about the current state of affairs in the organisation. In this respect, changing a school's pedagogy is no different than any other form of organisational change (p. 78).

Further to this, there are social justice implications for leaders when a significant variability of pedagogical approaches exists within a school community. As Lingard at al (2003, p. 402) assert the "[q]uality of pedagogy is also an important equity issue for all students".

An examination of 'pedagogical fluency'

This section reports on the participants' discussion of the concept of *pedagogical fluency*. Given that it is not widely used in the literature or commonly discussed in practice, questions were posed in each interview from a range of different angles to explore this concept further.

In the principal interviews in December and March and principal focus group in June, participants were asked to indicate whether the school leaders had decided that teachers would employ specific pedagogical models and to suggest the reasoning around such decisions. Principals were then asked to cite some of the pedagogical models that their teachers *chose* to employ and discuss the ways that these models helped to meet the needs of learners in their school community. Principals were also asked to discuss what "fluency" meant in relation to pedagogy and what pedagogical fluency did - or could - look like in their school. Aside from specific pedagogical models, principals were also asked to discuss other, more general pedagogical strategies, approaches, and intentions suited to their school context, and the reasoning around these. Finally, they were asked to distinguish between what they were currently doing in relation to pedagogy and what they intended to do in future.

During the school visit focus group sessions, classroom teachers were asked to discuss *pedagogical fluency* in connection to what they and their colleagues were doing in the classroom. Initial and follow-up questions in these focus groups explored aspects of pedagogy similar to those explored with the principals, including specific models and other more general teaching approaches, strategies and intentions. Teachers were asked to indicate whether they were choosing to implement particular pedagogies (that is, without specific directions from school leaders) or as part of a whole-school or whole-department approach (that is, directed by leaders such as the principal or head of department).

In addition to examining the form of pedagogies in each school community (for example, as an approach, instructional method, or philosophy), researchers aimed to examine how pedagogy-related leadership decisions impacted on equity within the school community. For example, three principals cited the need for all teachers in the school to adopt a "whole-school" pedagogical approach to ensure greater equity in their school community, while two maintained that pedagogical decisions needed to always be made at the level of an individual teacher in a classroom. The remaining three principals advocated a balance between whole school approaches for major initiatives such as improvements to literacy and changes to assessment while leaving other pedagogical decisions to be decided at an individual level. These data suggested an interesting split between pedagogical change that is whole-school or classroom-based and they draw attention to the ways that school leaders work to ensure equity by enabling quality pedagogies in their school community.

December, 2014: Principals identify key aspects of pedagogical fluency

One of the main aims of the December interviews with the principals was to accurately identify schools that were employing specific pedagogical models. Related to this aim was a need to explore why certain models were of interest to participants - and, aside from specific models, what general approaches, strategies or other pedagogical initiatives were being implemented. In exploring these areas, the researchers hoped to gain a better understanding of participants' perceptions and understanding of the concept of pedagogical fluency - with the range of models, approaches and strategies discussed - relative to their school context. Two important themes emerged:

1. The participants' belief that multiple methods rather than a one-size-fits-all approach is needed in their schools; and
2. The perception that pedagogical models hold some relevance in guiding school leaders, but that good pedagogical practice is "more than a model".

Theme 1: Pedagogy needs multiple methods not a one-size-fits-all approach

Amongst the eight principals, there was strong consensus about no "one-size-fits-all" pedagogical approach, strategy or model. When asked why they believed multiple methods were preferable to any one method, participants generally cited variation between learning

styles, differing subject areas, individual teacher strengths and weaknesses, and other forms of diversity in the school community. Summing up the inability of one model to meet the needs of their learners, one regional school principal stated, “there is too much diversity in the needs of the kids here”. Citing differences between secondary subject areas, they added that “with the different teachers you’ve got here, they have different strengths in different areas too… the thing in our school would be it is really a matter of the courses [subject areas] and identifying what works best for a particular class or for a particular child”.

Another regional school principal also identified the requirement for different subject areas to use different pedagogies. This principal drew attention to issues faced in the subject areas of Mathematics and Science, where certain cultures around largely teacher-centred approaches (“chalk and talk”) worked against the implementation of other forms of pedagogy:

> [For example] as a Maths teacher, I will use whatever pedagogy needs to be done to cover the content that I’m doing because [there is a belief amongst Maths teachers that] you cannot do a rich task. Math and Science will really scream at you if you say you’ve got to do a rich task because to cover their content, you’ve got to do ‘chalk and talk’ [direct instruction]. Some of it [the content] you can do with independent learning but if anyone dictated to me [as a Maths teacher] ‘you must use this one and only pedagogical approach’, I would say ‘no way!’.

The need to acknowledge varied teaching approaches was also evident in the participating primary schools. When asked whether they preferred one method or multiple methods, one metropolitan school principal observed, “I don’t think one approach is going to work for everyone [at this school], and I don’t think it allows for individual teaching styles”. An acting principal of a regional school shared this view and argued against one model, they advocated for “looking at… what suits these children [in our school] most”. Taking this argument further, a metropolitan school principal disagreed with the idea that “there would be one model that would answer all the questions or [meet] the learning needs of different students in *any* school or educational jurisdiction”.

Theme 2: The relevance of pedagogical models as “guides”

Interestingly, in spite of the consensus that there was no *one* model that would adequately serve each school community, there was support from half of the participating schools (for specific models as part of a school’s broader approach. In these cases, when principals cited models, they tended to support the school’s planning in unique ways that reflected aspects such as the school culture, the strengths and interests of individual teachers, the beliefs of school leaders, and the school’s access to professional learning. The four principals identifying particular pedagogical models suggested that, in each case, the model played a “guiding” role for the school leaders and was something that they felt was worthwhile to explore in greater depth in the future. The models discussed in these interviews included *Project* - and *Problem-Based Learning, Inquiry-Based Learning, Design Thinking*, and *4Mat*.

Two principals of metropolitan schools indicated their support for Project- and Problem-Based Learning. For one of these principals, these models provided guidance about how to establish strong learning partnerships between a teacher and a child. In particular, they felt that the emphases on longer term projects that require creativity, problem-solving, goal setting and collaboration "gives you flexibility... and the ability to learn so many different things than with one set [traditional] approach". The other principal similarly believed that Project-Based Learning was a highly student-centred approach that engaged learners in their school community more effectively, noting that it was "definitely included in the school's planning". Furthermore, the school had used this model to guide teachers in some of the ways that they might redesign the physical layout of their classrooms. With students working in teams on longer-term projects, they noted that classroom design was a key intention moving forward:

> Some teachers address it [redesign] by taking the kids outside, taking them out of their physical classroom, rearranging their desks and tables and I guess what we need to look at over time is changing some of the furniture and things like that for them too but that is something that is going to have to be done over a number of years.

One principal of a regional school was vocal in their support for pedagogical models as a way of ensuring that all teachers were "on the same page". In particular, they described their leaders' interest in combining Inquiry- and Project-Based Learning to ensure that "we have students directing the learning". They further believed that the combination of these two models could provide ongoing support for both "early adopters" and more resistant teaching staff, "giving them the confidence to take on new experiences and challenges". They also described their "excitement" about the possibilities that exploring this model could enable:

> The idea of adopting one model [the combination of Inquiry- and Project-Based Learning] would allow for staff to feel that they could manage the change of approach, and you know there'll be early adopters, there'll be people who have already started Inquiry-Based Learning or Project-Based Learning, other people need to be, I suppose, encouraged, and other people have to see that it's going to work first before they're willing to take the risk. In terms of that improvement, I've got to sometimes keep myself in check, because I get a bit excited about the possibilities, and I have to bear in mind that, in Secondary, the staff have a range of classes so they're looking at a range of students and differing abilities and things, and it is that gradual shift in terms of that mind-set, you know, that old world paradigm in terms of a new world of thinkers and so I have a strong background in professional learning so I'm the learning and leadership officer normally, so I've come in and thought, 'Oh my goodness, what's going on?'.

The principal of a metropolitan school similarly emphasised the value of whole staff training in *4MAT,* an instructional approach for scaffolding higher order thinking (see, for example, Aktis & Bilgin, 2015). Referring to their earlier work with the *NSW Quality Teaching Framework*, this principal argued that teachers needed a way to *practically* implement conceptual models and that a pedagogical model could facilitate a common understanding of how to do so:

> All my teachers are trained in *4MAT*. Now, that is a pedagogical approach that is embedded [implicit] in the *Quality Teaching Framework.* Many years ago, I was a *Quality Teaching* consultant, and what I found was that a number of teachers that I worked with across the state had difficulty in "hanging" that framework on what it looked like in the classroom... especially in secondary schools, because they're very focused on their content. Now, we use *4MAT*, everyone here is trained in it and basically they [my teachers] are looking at how they can engage the different types of learners. We have some staff who are fully qualified *4MAT* trainers, and every new staff member that comes in, that is the *language* and the conversation we use around teaching and learning (our emphasis).

Finally, this principal also indicated their support for Project-Based Learning as part of the school's current and future planning. They pointed to substantial learning gains that had been achieved from implementing this model approximately one year before participating in the project, noting that it had supported teachers in their engagement of students, design of assessment tasks and management of learning. They indicated that they wanted their teaching staff to "make sure that we continue with the professional development and continue with Project-Based Learning, so that we actually are getting productive pedagogy rather than just chalking-and-talking [direct instruction]".

March Data: Principals and pedagogical fluency in their school context

During the March interview, principals were specifically asked to discuss the concept of pedagogical *fluency* with recourse to ideas they had gained from their involvement in the project. Given that the March interviews were conducted during the course of Workshop 1 (the first day that teachers from all eight schools had the chance to meet one another and the project team face-to-face), these data still represent a fairly early point in the project. However, since the time of the December interviews, all principals had been acquainted with the nature, purpose and scope of the project, as well as having had time to think about their plan for involvement. It is also important to note that principals were generally aware of recent policy changes such as those discussed in *Great Teaching, Inspired Learning* (NSW Government) that include the need for multiple teaching methods with greater evidential support.

From these data, two main themes emerged:

1. Some participants (especially principals) view *pedagogical fluency* as the understanding and application of multiple teaching methods coupled with the ability to evaluate their effectiveness; and
2. The concept *pedagogical fluency* holds relevance for both principals and teachers but there are challenges implicit in the process of educators becoming *pedagogically fluent*.

Theme 1: Defining pedagogical fluency with multiple methods

In line with the thinking that underpins current educational policy in New South Wales Schools, most principals articulated *pedagogical fluency* as an ability to understand and apply - or "be fluent with" - multiple teaching methods. However, closely related to this was the ability to be able to justify the use of a method with reference to the needs of the learners in the school community, or with reference to other evidential support (such as educational research and policy). For example, one principal of a metropolitan school described pedagogical fluency with an "analogy" of a highly effective teacher:

> When we talk about students having reading fluency we know that they have all of the skills and strategies to read; they can decode, they can phrase, they understand about all the concepts of the print, they've got good phonological awareness. If I was going to make an analogy for pedagogical fluency, I would say that it's an educator who can move fluidly between approaches at any given point in time because they can see that there's a student need to for it [the given approach]… So, to me, fluency is a teacher who has a repertoire of skills, they understand their effectiveness and when they should be used, and which students they're more effective for, but always have that really high standard of expectation of what kids can achieve.

Another metropolitan school principal also referred closely to the needs of learners in their community when describing pedagogical fluency. While noting the value of Inquiry-Based Learning for enabling stronger teacher-student learning partnerships, they maintained that effective practice represents a synthesis of strategies, models and frameworks:

> I suppose for different ways that you want the children to learn, different ways that you want your teachers to learn; that they use a pedagogical structure that would best suit that particular piece of learning. I don't think Inquiry-Based Learning is the single, sole way of delivering good education, so I suppose that fluency is the ability to grab different pedagogical sort of activities, or frameworks or structures to enhance learning based on content, environment, all those sorts of things.

One regional school principal suggested that the main aim of pedagogical fluency should be learner engagement for all learners in the classroom, to "provide different [teaching] techniques for all the different students in the room so that everybody's engaged or has the opportunity of being engaged in their learning". Examining their role as a fairly new principal in the school, they argued that their teaching staff needed more exposure to multiple methods in order to determine the most effective pedagogies for their community. In similar ways to another regional school principal, they advocated a "hybrid" form of pedagogy that combined different models and approaches. They further believed that "ground up" innovation - where teachers could determine the pedagogies best suited to learners in their classroom - would lead to the most sustainable forms of pedagogical change:

> My management style is developing things from the ground up, so...and I think that that helps with the sustainability. So, despite changes in senior executive team members, if you have that solid platform at the base level, at the classroom level, it'll be sustainable.

> So, in terms of developing models, I would be working with the classroom teachers on exposing them to several different styles, and then letting them drive where we go from there. So, would like this, one model, or whether we would like several, or whether we'd like to create our own hybrid.

Finally, another regional school principal described pedagogical fluency as being "able to make adaptations and, I suppose, personalise the learning for the students that you have".

Theme 2: The challenges of becoming pedagogically fluent

In recognising the importance of multiple approaches and the need for evidence when employing any given strategy, most principals were quick to point out some of the challenges inherent in their staff becoming more *pedagogically fluent*. Again drawing attention to the concerns of individual subject areas, one regional school principal described the resistance of some teaching staff who relied on textbooks: "a lot of Maths teachers are textbook-driven, and I think that if they saw different ways [other methods aside] that they can deliver material, then they might try that. I know that I have some that won't. They've been doing the same thing for 40 years and will be reluctant to change". This perception was also shared by the acting principal of another regional school, who alluded to "the blockers" they had to challenge in their school - "people that were very set in their ways and didn't want to do it [try other methods]".

One principal of a metropolitan school explored the impact of high-stakes standardised testing on their teaching staff, noting that teachers' concerns about their students performing well in the Higher School Certificate (HSC) represented a mindset challenge. They described the typical thinking of a teacher concerned in this way and explained their use of cross-KLA team teaching as a strategy for getting Secondary teachers "out of their comfort zone":

> [The teacher thinks] 'I have to get through this content; I have to do this because at the end there is an HSC exam'. And so part of the challenge has been putting some of the secondary teachers out of their comfort zone. So that they understand that the teaching and learning is not about the content, it's about the skills that they have to impart knowledge or to impart something into a child so that they can discover. So, for example, if you put a Maths teacher in an [Visual] Art class… they then have to think differently because Mathematics teachers sometimes have a certain way of thinking whereas an art teacher will think quite differently.

When asked about whether or not all teachers in their school community were pedagogically fluent, most principals suggested that "fluency" was limited to pockets of teachers. For one regional school principal, this was evident in subject areas, where he described, for example, differences between teachers of Music (with more student-centred learning) and Mathematics (with more direct instruction). Speaking more generally about the challenges of working with Secondary teachers, one regional school principal argued, "content-driven teaching and learning inhibits pedagogical fluency".

Two metropolitan school principals discussed their teachers' understanding of pedagogy as an important element of identifying whether or not they were *pedagogically fluent.* For one principal, this involved the recognition that pedagogical innovation was limited to pockets of teachers in her community. They observed that "we have *some* lighthouse teachers and we have some teachers who are particularly good at Maths or Literacy, and those sorts of things, and are very passionate". Identifying equity as a core concern for them in the coming years, they highlighted the implications of scaling pedagogical fluency across the teaching staff: "a challenge is being able to have it [pedagogical fluency] across *all* classrooms so there's some equity in children's education". Making the same observation as one of the regional school principals, they also admitted "we're still fairly reliant on textbooks". They also pointed out that there was a gap in understanding between rhetoric and practice: "whilst people, I think, articulate they are 21st century educators, I don't think actually in practice [they are]".

Although conceding that she also had pockets of pedagogical innovation in their school, another metropolitan school principal was keen to discuss achievements that had been realised at a whole-school level, highlighting challenges that included understanding pedagogy "in practice" and understanding why students were not engaged:

> I think it [pedagogical fluency] would vary in degrees. From where they [my teaching staff] were five years ago I actually think that they were really deficient in understanding pedagogy in understanding what good practice looked like. It wasn't their fault; it definitely was not their fault because they actually wanted to be good teachers or to understand why the children weren't engaging in the learning. And I think from my point of view what you would see from where our school was five years ago to where it is now that learning culture is definitely there. Could I say to you that every single teacher in the classroom currently is doing good pedagogical practice? Definitely not. But it is possible...

April-May, 2015: Teachers and pedagogical fluency in the classroom

During the school visit focus groups, researchers explored participants' perceptions of pedagogical fluency and sought to better understand the pedagogies with which participating teachers were "fluent". Two main themes emerged from these data:

1. A wide degree of variation exists between classrooms and other teaching units - and this is generally considered acceptable; and
2. Many challenges affect classroom teachers' development of pedagogical fluency.

Theme 1: Variations between classrooms

Given the wide degrees of variation between school communities that were evident in the principals' discussion of different pedagogical models, strategies and approaches, it was unsurprising to find similar variations between the classrooms within each school community. However, it was somewhat surprising to find considerable variation between classrooms and other units within a school - most notably, subject areas, student cohorts and primary Stages. At one regional school, the variation between subject areas that the principal had described

in earlier interviews was clearly evident in the teachers' discussions of the different pedagogical strategies, models and approaches they employed. One English teacher described the combination of Project-Based Learning with activity grids to promote more responsible, engaged and motivated learners: "English has been experimenting with like, project based learning and a little bit of grids and things to try and increase student choice and building their skills and self-direction and stuff. We find our kids here, like, motivation, like, that accountability and responsibility for their work".

The use of these strategies stood in contrast to Mathematics, where teachers were generally reliant on the textbook and direct instruction. In describing this reliance, one Maths teacher talked about a recent initiative to try other methods in his subject area - namely the use of the Flipped Classroom and a range of more student-centred technology tools. Both of these initiatives were considered unsuccessful for different reasons. Referring to their colleague's efforts to implement the flipped classroom, the teacher observed, "he had experimented himself with the Flip Classroom with his top Maths class and it didn't work - just didn't work. It was basically just a waste of his time and effort and he hasn't used it since". Identifying different technology tools, they described the challenge of students not utilising these tools to support their learning outside of the classroom:

> Yes, we've tried Maths Online, Mathletics... all those things; they're just not being used outside of the classroom. We can bring them into a room and they will use it [the tools] obviously. We can obviously log in ourselves and see what they've been doing, but there is nothing being done at all, it's [the technology] not being used. So we got rid of *Maths Online* for that reason. We tried the *Mathletics* this year and so far it's… un-utilised.

Teachers at one metropolitan school did not typically show the same variation in pedagogies between subject areas, tending instead to describe a number of approaches that were developed and implemented through cross-subject area teams. However, they did indicate considerable variation between student cohorts, arguing that this variation called for pedagogical fluency. With a low-SES population and the addition of students from many non-English speaking cultures, the teachers in this focus group believed that pedagogical fluency was needed to ensure that strategies relevant for each learner were employed. Interestingly, one teacher described the phenomenon of having three distinct groups in the school that included "top quality students" attracted to the selective streams offered who were learning alongside both mainstream and special needs students:

> Because we have tried to attract a different clientele and have been successful with the selective streams etc. and we are getting a lot of top quality students coming but we still have our other clientele and so what comes up mostly in our faculty especially in the senior levels where they are not streamed. And then you've got kids that are hoping for a band six. We have this…you've got almost three distinct groups that you're trying to teach which then requires teachers to have an enormous and fluency.

Among the classroom teachers in the participating primary schools, there was evidence of variation in pedagogies, though not to the extent of the two participating high schools. There was, however, evidence that the kinds of "lighthouse teachers" a metropolitan school principal had described who were exploring their own interests and sharing their findings with colleagues during staff meeting and professional learning sessions. At this school, one teacher described her interests in the Flipped Classroom and intentions for moving forward:

> I've been looking at the Flipped classroom and tried to make my day into three sessions where I have literacy in the morning, numeracy in between recess and lunch and then I have investigation and creativity in the afternoon. So and putting groups and learning stations together there, but it's a very slow process and a very gradual process and I'll probably get there to some degree by the end of the year.

At another metropolitan school, the small group of teachers that had begun to explore and implement Design Thinking described their work following the first workshop day in March: "we hadn't come across design thinking until we came to the very first day of *Future Pedagogies* and I think it struck our imagination because we have done so much work with the conceptual framework and we have done so much work with project based learning".

Teachers at one regional school were well aware of the implemented "learning walks" that involved teachers and other visitors entering classrooms and asking students "what are you learning?". One teacher described gains that they had made in moving their Mathematics curriculum away from the reliance on "busy work". With further reference to this subject area, the teacher described a change from students seeing themselves as "simply doing Maths" and in being able to describe the particular topic on which they were working. The teachers at the school believed that students taking more interest in specific topics and areas of study reflected the move away from "busy work", noting:

> So they [students] can look at it and go [say] 'this is exactly what we're doing'. So that's, yes that's definitely a changed style of teaching and if we can continue that into English so that again we don't have that busy work, but we've got a specific focus, then that would be a great outcome of this project.

This report about the varied pedagogical approaches that were identified by the principals presents an implication in relation to the variability of the learning experiences of students in respective classrooms. As Lingard et al (2003, p.402) assert "Quality of pedagogy is also an important equity issues for all students".

Theme 2: Challenges for teachers' development of pedagogical fluency

Similar to those principals who described a range of challenges that can impede the development of pedagogical fluency, classroom teachers were able to articulate the challenges they felt affected the range of strategies, approaches and models they employed. At one regional school, these challenges were especially evident. The Learning Support Teacher discussed the challenges facing her as stemming from the student cohort -

particularly the many low-literacy level students who were unable to read and who had disengaged from the mainstream curriculum. In a similar way to the teachers at a metropolitan school with a low-SES population, she saw this challenge as one that required better support through a broader range of strategies. However, with a limited understanding of what her colleagues in the mainstream curriculum areas were doing, she described herself as mainly working in isolation:

> I think as a school need to learn to support our kids with low literacy better as they come in from year six and help them to become able to succeed. Otherwise they disengage and this stuff becomes irrelevant to them. So if we could be more supportive in the way that we teach them in the classroom. I don't know what the rest of the school are doing because I don't teach mainstream but I have had a lot of teachers come and say – do you have anything that I can use with my year seven class, they are really struggling. A lot of them can't read so I don't know that's just an observation that I've come across and I feel, you know we might… to share resources and knowledge about how to support them.

When asked whether professional learning sessions provided an opportunity to share pedagogies that might address some of the problems with the student cohort, classroom teachers at this school were generally unenthusiastic. This lack of enthusiasm suggested a divide between these teachers and their school leaders, with one teacher going as far as to suggest that professional learning was more about advancing the individual interests of some school leaders than addressing the problems: "I think our professional learning is focused on individuals and what they want for themselves. It's not focused on how we can help each other and how we can help the kids as a whole school by sharing and learning together".

At one metropolitan school, the need to work with the three cohorts of differing abilities meant that, in spite of gains, they still faced many challenges in their teaching. One teacher believed that technology had been instrumental in her being able to strategically differentiate her lessons for these different groups, conceding that in spite of the broader range of technology available and her implementation of a broader set of pedagogical strategies, there were still problems:

> Where I think technology is the most useful is to help us to be able to teach three different lessons in one every single day. So that seems to be a huge thing. We've still got behaviour issues, we've still got kids not submitting stuff, and we've still got kids who are out of the classroom at the drop of a hat. You've got welfare and social issues on a huge scale then you've got kids whose parents who are at the principal now going [saying], 'how come my child missed out on that one mark?'.

For the small group of teachers at another metropolitan school implementing Project-Based Learning, there were still gaps in their understanding - and that of their colleagues – as to how to effectively implement the model. As one teacher noted, when implementing Project- and Inquiry-Based Learning, some teachers still defaulted to a heavy reliance on teacher-led instruction.

> Even though *Project Penguin* [Project-Based Learning assessment task] is a worthwhile thing to be a part of and another one that we're a part of - *Design, Make, Innovate* - they're both really valuable projects but we always get to that stage--well, first of all, they seem to be terribly teacher-led in the early stages and I don't really see that as Inquiry-Based Learning.

Finally, for staff at one regional school, teachers admitted: "trying anything away from the textbook is a huge challenge for us…". Textbook reliance was evident in both primary and secondary departments of the school, leading one primary teacher to "worry about the future" because she was aware that many other primary schools had moved away from textbook reliance and that she was unable to convince her colleagues to do likewise.

June, 2015: Principals and their perceptions about any pedagogical changes

The final principal focus group explored the extent to which they believed pedagogies had undergone changes in their community during the project, as well as inviting their perceptions on how pedagogies might evolve in future. One of the project's aims was to bring schools together so that leadership teams might be more aware of specific pedagogies that were being developed and employed in other schools. The workshop days provided a forum for discussing these and other issues. As such, the final principal focus group session in June represented an important culmination of leaders' ideas about pedagogical fluency, bringing together what they thought had been developed and what they hoped to develop and apply further in future. These two areas are addressed as separate themes below:

1. The perceived achievement of current pedagogical changes; and
2. The planned development of future pedagogical changes.

Theme 1: Perceived achievement of pedagogical changes

All principals generally believed that their involvement in *Future Pedagogies* had fostered the further development of the pedagogical fluency of their teaching staff. Half of the principals tended to believe that their participation represented, in the words of one principal, "a starting point", and that there was further work to be done. The remaining half of participating principals saw the project as a *continuation* of work done previously, with the role of the project, in the words of one principal, as "cementing" and "validating" previous initiatives.

For the principal of one regional school, involvement in the project had led to the "awakening" that their staff ultimately lacked the pedagogical fluency that would be needed in future. Speaking candidly about this realisation, they drew attention to the dominance of low-order pedagogical strategies that were currently in place in the school community and described the challenges of working across a Kindergarten-to-Year 12 (K-12) school:

> For my team it's been, I suppose, a bit of an awakening that we actually are not as far along the pathway of quality teaching and learning as we thought. Particularly when the

> team had really shared understanding about what we wanted to achieve and what they themselves were doing but when we examined practice across the school in that K12 perspective. With both staff *and* students, we found that things were at a very low order, so there is a real need for us to take a few steps back and recreate, I suppose, that pathway for professional learning so that we have consistent collaborative practices in terms of what we're aiming to do.

Another regional school principal similarly conceded that their teaching staff had "a long way to go". However, by encouraging teachers to meet and share strategies, they believed that their ideas about "ground up innovation" could be realised. They described changes to the structure of staff meetings to allow for more sharing of ideas, discussing the example of the "five minute technical tip component" at the start of every meeting:

> What we've built into our staff meetings as well is a five-minute technical tip component where teachers volunteer to come out and say something they use in technology for in the class room. And they're talking along introducing something similar to the sessions that used to occur. But it will just be voluntary and it will be coming from the teachers.

Some principals suggested that their involvement had been a catalyst for changing mindsets in relation to pedagogy. The principal of one metropolitan school observed that their team of teachers working in the project had now recognised "that they actually need to be the [pedagogical] drivers for change".

Another metropolitan school principal similarly noted a change in their leadership team, all of whom now felt more "responsible for ensuring that they are embedding best practice in teaching and learning." Referring to their involvement as the continuation of good practices already established, this principal described the responsibility the executive team now had for the learning of both students *and* teaching staff at the school:

> From my point of view what it has done is it has more or less cemented the journey because as you know we had a pedagogies framework in which we're working around our teaching and learning. And what it has done it has now allowed the executive to facilitate those skills around and have a better understanding. But not only learning that happens in the classroom but learning responsibility they have for the learning of their co-workers. And I think that is really important as well.

Two metropolitan school principals both discussed the strong nexus between theory and practice as an important outcome from their involvement in the project. One observed that it helped their teachers make better links between theory and practice, while also helping them to contextualise their involvement in other conferences, professional learning and professional reading. They noted that *Future Pedagogies* played an important role in their teachers being able to put theory "back into classroom practice, and then to share that [informed] practice with their colleagues". The other principal similarly recognised the implications of the theory-practice nexus for future change, suggesting that the project had "reaffirmed for them [the teachers] that theory and practice [has] links, but then there is a professional responsibility to lead some change with their colleagues".

Drawing on this discussion of the relationship between theory and practice, a third metropolitan school principal believed that reflective practice was the best way to ensure that genuine pedagogical change could be realised in their school community. Referring to the work of their "lighthouse" teachers, they argued that their reflective practice would lead to more wide scale change across the school, "looking at what they can do and the adjustments they can make in the small ways - then make it larger as it becomes a pendulum shift, I suppose, over time".

Two metropolitan school principals argued that teacher-learner partnerships were strengthened through their involvement in the project. One principal described this as the "redefinition of relationship between the teacher and student in the classroom", while the other talked anecdotally about asking for help from Year 6 students in using a technology tool:

> I now outsource [knowledge about how to use this tool] to a group of students. I didn't know how to do a *PowToon* presentation, so I just sent an email out to my senior [Year 6] classes saying 'I need somebody to do a power tune for me, I'm not going to tell you how to use it you have to find out yourself because I don't know. Email me back if you're interested'. Then I had a group of six kids come and see me and they've now turned our school vision statement into a *PowToon* presentation ready to go on the school website. I think harnessing this to overcome some of those…if I'd asked a teacher it would have been, 'I've got reports and I've got this and I've got that'. So remembering that we do have a body of willing participants!

To visualise the pedagogies that were being employed in their school, one principal generated information for staff that included important terms of reference and statistics about specific strategies and approaches being applied. Importantly, teachers were asked to "define constructivist learning in their classrooms". Following these individual definitions, teachers were asked to "do a *Teach Meet*", an informal professional learning session with a small group of colleagues, where each teacher shared the pedagogical strategies that worked well for them in realising constructivist learning. Teachers were also required to collaboratively plan and deliver lessons for their colleagues so that they had a better understanding of specific pedagogical practices. For the principal, involvement in *Future Pedagogies* had helped to ensure that any practice that was shared had an evidential support base.

Theme 2: The development of future pedagogical changes

All principals were able to articulate a vision for future pedagogical change in their school community. For most principals, this involved a discussion of the challenges that needed to be overcome in order to achieve their intended changes. One metropolitan school principal explained the difference between rhetoric and practice, noting "while they [teachers] often think they are doing it and they talk like they are doing it [pedagogical change], the actual authentic *look* of it in the classroom is quite a different story". Another metropolitan school principal alluded to the same problem of not having all teaching staff "on board", drawing attention to the "blockers" who were able to talk about changes to their practice without

necessarily applying those changes in practice. They resolved to achieve change without their explicit backing:

> We are working in a group of community schools and our again being quite a small school, all staff have… yes they might not have taken it on fully but they have shown some interest in using ICT and developing their skills. But when we're trying to engage these other schools and saying, 'look we've got this, we've been to Sydney we've tried this, how about we have a look at that?' 'Oh no! That's too hard, my staff wouldn't do that'. So we're hitting those blockers all the time and we just made a decision well we want to keep on that journey and we will continue to move and if they don't come along with us well, that's to their detriment.

A third metropolitan school principal had determined to further develop cross-subject area classroom observations as a way to observe and share pedagogical practice into the future. They managed this process by having each member of staff develop a "personal development plan" in consultation with each head of department. All teachers identified skills they wished to develop further, and were paired with other teachers who had developed these skills. In relation to the concerns raised by another metropolitan school principal about the divide between rhetoric and practice, this principal believed that these observations provided important "reality checks" while also giving them important contacts for further support in targeted areas of weakness:

> The staff has actually identified the lessons that they want and an area [in which] they want to build up their skills. They're actually going to go and observe [lessons] and so it's going to be something that they're going to report on and going to provide evidence that they have achieved that [skill], because I think the really interesting part is like you [Jo Wilcher] were saying, teachers' perceptions of where they're at can be quite different to the reality and so what we're saying…we're not saying that, you know, 'you're not doing that' but 'what you need to do is provide that evidence to show [you've achieved the skill], and if you're not that's okay, we will provide the additional support'.

Five principals believed that leadership teams were far more aware of what they didn't know - and needed to achieve pedagogically - as a result of the school participating in *Future Pedagogies*. One metropolitan school principal discussed this realisation in terms of quality teaching and professional standards, particularly with the current implementation of the *Australian Professional Standards for Teachers* (AITSL). They noted that "when we talked to staff and observed what was happening, there was no connection there [between the standards and classroom practice]. So for me that's going to be the connection to go back and look at where we're seeing at that *Proficient* level [standard] to ensure that at the base line that's where we're at". At the same time, this principal recognised that "others [in our community] are at that *Highly Accomplished* or *Lead*, and we're really looking at those dimensions of engagement and connectedness and intellectual quality to really improve our practice".

One principal of a regional school described “a whole new branch of discussion” occurring among their teaching staff around differentiation. They believed that exposure to a broader range of strategies was necessary for ensuring that their teachers employed the best strategy suited for each learner.

For another metropolitan school principal, a key outcome with implications for the future was the identification of a need for greater pedagogical fluency in the school community. In particular, they wanted their teachers to make better choices around “when to use more explicit teaching, when to step back and let the students take ownership of that [learning]”. They conceded that in order for this to occur, more time in the school’s professional learning agenda needed to be made for newer initiatives. They further explained that, to a certain extent, leaders needed to address the question of “what good thing can we let go so that we can do something even better”, elaborating, “because in teaching there are so many good things, so what can we afford not to do so much of?”.

In discussing their initiatives for the future, two metropolitan school principals drew attention to the importance of autonomous professional learning. For one, this was articulated as the challenge of teachers “owning their learning and being constructive in terms of defining what it looks like in their classroom, for their children and for themselves”. While they believed that leaders could play a role in guiding, they felt that authentic learning should be led by the individual: “while you can give that [the professional learning] to them, they’ve really got to find it for themselves”.

The other principal similarly alluded to the role of the principal as one of challenging teachers, setting standards and encouraging more evidence-based practice.

> I think in the leadership position [Principal], what I found and I think I articulated it to you, is *pressure* and *support.* Sometimes in my role I have had to challenge and question and basically, you know, say well, ‘no, that is not the way and this is’, you know. And that’s been hard but it’s all been based on research, it’s always been based on best practice and what has happened is the staff has seen the success and so they spread the word.

It appears from the data of this final principal focus group session in June that *Future Pedagogies* had provided an opportunity for the leaders to reflect on the current practices in their schools, to enhance some pedagogical aspects and to effect changes, and to identify areas of pedagogy for further development in the future.

11. Pedagogy, technology and looking to the future

Research Question 4: What role can contemporary technologies play in developing pedagogies for current and future learning needs?

In our contemporary context, pedagogies are also influenced by the at-times rapid changes in information communications and technologies and the digital age. Exploring the relationship between technology and pedagogy, some researchers point to technology's capacity to enable "disruptive innovation" (Christensen & Raynor, 2003), while others note that this disruption can play a positive role in supplanting many traditional, entrenched pedagogies such as an over reliance on direct instruction or lecturing (Hedberg, 2011). For example, wide-scale movements like "grass roots video" begun several years ago (L. Johnson, Levine, Smith, & Stone, 2008) have now led to pedagogically-informed models such as the "flipped classroom", where teachers reserve face-to-face teaching time for "active, problem-based learning activities founded upon a constructivist ideology" and relegate direct instruction to recorded video (Bishop & Verleger, 2013, p. 2).

Technology's role in the re-thinking of pedagogies is further evident in research that emphasises the skillsets that teachers and students should demonstrate in contemporary learning contexts. Among these, widely recognised frameworks exist such as "online participatory cultures" (Clinton, Purushotma, Robison, & Weigel, 2006), "twenty-first century fluencies" (Crockett, 2011) and "digital literacies" (Hague & Payton, 2010). All of these examples are closely tied to the need to re-think traditional pedagogies and to develop newer models and approaches that address the needs of learners.

The development of digital pedagogies, whereby activities are student centred and use resources of a digital form, is an evolving field. Prestridge (2012) characterises these as practices:

> where ICT are fused with learning as engagers and facilitators of thinking and construction, where the student is viewed as an active creator and user of information within learning dynamic supporting collaborative investigation of real life happenings within multidisciplinary global contexts" (p.457).

Pedagogies for educational technology will also consider the social context in which learning and teaching occurs and the nature of the relationships established (Jaffer, 2010). As schools and systems re-think their pedagogies in the digital age, the redesign of the physical layout and functionality of schools to better meet these needs is also a factor (Pearlman, 2010).

Fullan (2013) explores the impact of a changing paradigm in order to embrace new ways of thinking with the increasing use of technologies as leading to "the new pedagogy" of "students and teachers as learning partners." Implicit in realising this partnership is a need to address the problematic "push-pull dynamic":

> The push factor is that school is increasingly boring for students and alienating for teachers. The pull factor is that the exploding and alluring digital world is irresistible, but not necessarily productive in its raw form. The push-pull dynamic makes it inevitable that disruptive changes will occur… with more radical change in the next five years than has occurred in the past fifty years (p. 23).

Other researchers explore the turbulence of change in terms of what it might mean for future pedagogies, drawing attention to the de-professionalization of teachers as a significant factor that works against the development of effective pedagogies in many schooling contexts. Noting the neo-liberal emphasis on competition in many educational contexts, Hargreaves (2003) has argued that such competition "prevents schools and teachers from learning from one another. People keep their best ideas to themselves. Districts become the antithesis of learning organisations" (p. 168). Similarly, in reference to the implementation of national teaching standards that reflect, in her view, a lack of trust of teachers' professionalism, Connell (2009) maintains that "market-oriented neoliberalism is profoundly suspicious of professionalism; it regards professions as anti-competitive. Specifically, neoliberalism distrusts teachers" (p. 217). Extending on these arguments, Hyslop-Margison and Sears (2010) point out that "competition in the educational 'marketplace' and external accountability frequently thwart the professional collaboration required to enhance pedagogy" (p. 7).

Research conducted in the United Kingdom (see Twining, Raffaghelli, Albion & Knezek, 2013) indicates that change is needed at several levels in order to develop technology in teachers' pedagogies. It is suggested that ICTs should be viewed as opportunities for new goals for teachers' professional learning, and for new structures and roles within the school context. As our data revealed, educational contexts do not always support teachers' individual efforts in innovative pedagogical uses of technology, therefore school systems will need to provide adequate finding and infrastructure as well as offering professional learning (Somekh, 2008).

There are many challenges ahead for educators as they work to bring about pedagogical change and develop the sorts of pedagogies flexible enough to sustain their practices in a changing digital age. To be responsive to an increasing array of technologies while supporting the learning outcomes of all their students, and for schools to meet contemporary educational demands and to manage the varied contextual influences they experience daily, will require significant leadership and vision.

The relationship between pedagogies and technology

This section reports on the participants' perceptions of the relationship between pedagogies and technologies in their school community, and their perceptions of how their pedagogies might evolve in the future. We have argued for the need to pluralise pedagogy to reflect the diversity of contemporary approaches, it is similarly important to view *technology* in a plural sense.

Across all the schools involved in this study, a wide range of technology tools and platforms was employed to promote different forms of teaching and learning. It could be argued that, in all cases, participants' use of technologies in specific ways reflected their underlying pedagogical approaches. In some cases, it could also be argued that certain technologies played a transformative - or even "disruptive" - role in shaping some of the participants' pedagogies, encouraging them to employ new pedagogies that they felt the particular technologies supported or enabled.

In the interviews and focus group with principals, questions prompted participants to discuss how technologies were being used in the school to support and/or enable pedagogies to meet the needs of their learners. Related to this, principals were asked to discuss any contextual constraints that influenced the deployment, uptake and effective use of technology. Finally, principals were asked to discuss, in light of current technology trends and changing educational policy and curricula, how pedagogies in their school community might evolve in future. Principals were particularly well placed to discuss how key leadership decisions and initiatives shaped the current and future uses of technologies in their school.

In the school visit focus groups, classroom teachers discussed specific technologies that they felt supported and/or enabled the pedagogies that they sought to employ in their teaching contexts. Where possible, classroom teachers were asked to provide clear examples of these technologies, while also commenting on technologies that they perceived were of lesser value to their school. Teachers were also asked to discuss technology-related contextual constraints that impacted on teaching and learning in their classroom and whether or not they had ways of addressing or "working around" these constraints. As was the case with principals, teachers were asked to discuss how pedagogies might evolve in their school community in future. Overall, while principals' responses were useful for identifying key relationships between leadership, technology use and pedagogical change, the classroom teachers' responses were valuable for providing more granular insights into how specific uses of technology informed classroom-based pedagogical change.

December, 2014: Principals Identify Technologies that Enable, Support and Transform Pedagogies

During the December interview, principals described how technologies were being used to enable, support and in some cases, transform pedagogies. Data analysis revealed that

perceptions about technology use generally fell into two distinct groups. The first group of principals tended to believe that they were at the start of the journey of using technologies effectively to genuinely support pedagogical change in their school. This group typically described less effective uses of technology that had been occurring in the past, with a particular focus on teacher-centred technologies such as data projectors as well as the limited uses of laptops only for note-taking and word processing. In the second group, principals were able to describe more effective uses of technology and to make clear connections between these and the pedagogies. Perhaps unsurprisingly, these principals tended to emphasise more student-centred uses of technology and other attributes such as digital creativity, sharing and collaboration.

Two distinct thematic patterns in relation to technology use emerged:

1. The commencement of change to shift from teacher-centred pedagogies with limited technology applications; and
2. The building of student-centred approaches using various technology applications.

Theme 1: "We are at the start of the journey": moving from teacher-centred approaches and limitations with technology tools

Half of the principals provided descriptions that reflected an underlying perception that their school was at the start of a journey to realise more pedagogically informed uses of the technologies that were available in their school community. As a new principal, one regional school principal spoke in both the present and future tenses, to indicate that further time was needed to properly consider how to use technology effectively:

> I think that, in time, we'll be looking at more backwards mapping and we'll be having a look at...well, there are already people starting to look at differentiation and using technology within assessment tasks - how students can achieve different levels. So, I think, in time, that [focus] will continue as we employ more and more ICT.

One of the metropolitan school principals was also new in the role. They were especially frank about the limited uses of technology in their school, stating that, "previous to this year they [staff and students] didn't have *any* technology: they had interactive whiteboards which are glorified overhead projectors in this room". Interestingly, their use of the phrase "any technology" to discount the use of teacher-centred tools as "glorified overhead projectors" represented an important early finding about the at-times inappropriate use of expensive technologies that did little to promote the pedagogies needed for the learners. Another regional school principal also explored this problem in relation to a Bring-Your-Own-Device (BYOD) policy they were developing with school leaders. They believed that across both the Primary and Secondary areas of the school the majority of teachers were reliant on teacher-centred technologies and that this reliance would not effectively prepare the school for BYOD:

> On the whole, staff are using technology in a very teacher-centred way. However, we have one technology champion in the primary [school] who has started to develop a

> professional learning plan for us around using technology as a tool for teaching and learning. We have a number of secondary [teachers] that have started to consider how technology can be utilised, and next year, we will commence our Bring-Your-Own-Device policy. Okay, we've got a policy, but we really need to look at how technology is being utilised. I have a real concern that we'll just have, you know, 'electric notebooks', and that really defeats the purpose [of BYOD].

Finally, at another regional school, the principal believed that the school community was still very ill-equipped with technology infrastructure and that more time was needed before technology-informed pedagogical change could be realised. Describing their leaders' intentions to explore BYOD more fully in the year to come, they noted "in the next 12 months of professional learning moving forward, we will be in a place to see much stronger use of technology in classes". Alongside this professional learning, they believed the school needed to "build a much stronger platform in terms of technology and learning programmes".

Theme 2: "We have moved on" – building student-centred approaches with various technology tools

The other half of the principals described varying levels of progress in ensuring that technologies were being used to support pedagogical change in their schools. One regional school principal believed that the trolley of thirty tablet computers was an excellent investment and felt confident they were "being used educationally - not [as] toys". Similarly, a metropolitan school principal believed that substantial gains had been made by moving technology use away from computer labs and deploying tablets into classrooms. They observed that these devices were being especially well used in upper primary to support Project-Based Learning, noting that these teachers "integrate it [the device] into as many key learning areas as they can".

Another metropolitan school principal was unique in pointing out a distinction between using technologies to support the teaching of curricula as opposed using them to support pedagogical change. Describing infrastructure similar to other primary schools, they indicated that their teachers were able to use technologies to support their teaching of curriculum. They also recognised the that challenge of using technologies to support pedagogical approaches called for more diversity in the ways that students could demonstrate their learning:

> So we, like most schools, now have a bank of iPads and a bank of laptops and the computer lab where they go in and use it when that supports their curriculum, etc., so I suppose there's a different view between the technology supporting curriculum and then the technology supporting a pedagogical approach, so at this stage a lot of them use it to support their curriculum, but I suppose the pedagogies where they use the technology for students to demonstrate their learning in different ways.

Finally, a third metropolitan school principal emphasised the importance of technologies that fostered students' digital creativity and sharing. As an example, they described a media-based

assessment task in English that involved students creating, sharing and providing scaffolded peer feedback on each other's *Infomercials*, adding, "that's a case of, it's not using it as a 'notebook', they're actually creating things, sharing, collaborating…". Approximately five years into their role as principal in the school, they admitted that major change had taken place in 2014 when compared to other years: "within all of that technology deployment and use, there's a lot more of that happening this year than it has done in previous years. Is it where it needs to be? Not yet".

March, 2015: Principals Draw Further Pedagogy-Technology Connections

The December interviews with the principals helped to establish an understanding of the available infrastructure in each of the eight schools, as well as allowing for some exploration of related concerns about the ways technologies were being used or their limited applications. During the March interviews, researchers sought to investigate the connection between technologies and pedagogies further and to examine how the ideas raised in the December interviews were shaping.

Three main themes emerged from the analysis of these March data:

1. the importance of technology-pedagogy leadership in each school;
2. the evolution of technology-informed pedagogical change; and
3. the role of tech-savvy teachers demonstrating effective use of ICT to colleagues.

Theme 1: Technology-pedagogy leadership is, in part, a resource issue, and good leaders are hard to find

Among the eight principals, three indicated that there was a lack of technology-pedagogy leadership and that this needed to be addressed. For all three schools, this lack of leadership was framed as a resource issue, whereby each school was unable to access the support and expertise of individuals who could provide adequate leadership. One principal of a regional school described this problem in terms of having plenty of hardware but without guidance in how to use it effectively:

> I have lots of hardware in the school. I've got nobody that's suggesting to teachers or guiding teachers how they may be able to best use that technology… I don't have a leader of technology who can demonstrate effective use of technology. I've got people who go around and change print cartridges and order globes for smart boards, and things like that, but I don't have a leader.

When asked who provided technology-pedagogy leadership in another regional school, the acting principal's reply was simple: "just me". Elaborating further, they explained that their background as Education Officer for the Department of Education meant that they had provided technology consultation for a number of schools. This experience resulted in their current job description including the title of "technology coordinator". As acting principal, however, they conceded that it was challenging to provide this leadership for the community.

While their school had made substantial gains in technology-based skills and knowledge among the teaching staff, one metropolitan school principal argued that their school was under-resourced, with "a technology teacher that comes in" on a part-time basis. They added that while "he does team teaching to build others' capacities, it's very limited because my funding's very limited".

Theme 2: Technology-informed pedagogical change is an evolution, not a revolution

The principals' discussion of technology-informed pedagogical change that was occurring in their school - alongside future changes they were intending - suggested that such change was unquestionably bound to happen in light of rapid developments in the technology landscape. These were reflected in several school communities, such as one metropolitan school, where leaders had deployed over one hundred tablet devices for the four hundred students in the school. However, in all cases, principals were keen to observe that changes in terms of their teachers' pedagogies were more *evolutionary* than the revolutionary or "disruptive" changes imposed by new technologies (Christensen & Raynor, 2003). Half of the principals elaborated on the nature of this form of change. For the principal of one regional school, the rapid deployment of technologies in their school had certainly outpaced the pedagogies of the teaching staff. As a new principal, they had observed largely teacher-centred approaches with technology that did not genuinely enhance previously existing pedagogies:

> [As a new principal,] I haven't seen what happened pre-technology. The only thing that I'd say at the moment is that every classroom in the school has a smart board and has a projector, and most of it's not being used effectively, I don't think. I think, probably, the only way that pedagogy might have changed in some areas was, instead of putting stuff, like, putting a textbook on a desk, it's going up on a screen.

For teachers at another regional school, small gains were being realised in using tablet devices for more creative purposes. The acting principal remarked that with these devices, teachers and students were "doing more hands on learning… and creative tasks." In particular, the students were creating "documents, iMovies, you know, they're creating iMotion, HD videos, performances… they are using these iPads to create things". However, they also observed that the scale at which this learning was possible was severely hampered by poor access to technology facilities overall:

> We have, you know, we have facilities of three computers per classroom we don't have a computer lab in the entire school at the moment we've got 15 working computers for 200 students. It's the limits on technology for us are extreme; we just don't get the funding. We get a roll out each year of five computers, new computers. So when…they've got a life span of three years, I'm getting rid of five every year that I'm getting five.

In spite of the resource issues related to technology leadership, the principal of one metropolitan school believed their teachers were making effective use of technology. Invoking what they termed the "swimming pool" analogy, they described teachers "dipping in and out" in their use of technology, adding, "it's ok to use technology [for example] for

Internet research, if that's what it is, your purpose for the lesson". Similarly, another metropolitan school principal described gains in teachers making more relevant and meaningful use of available technologies. Most recently, their teachers had embraced the one-to-one (one laptop for every student in the school) technology environment and started using ICT for "for research, for problem solving, for collaboratively learning about something, for creative thinking…. [and] for all different things going on". They indicated that these changes had not happened across the entire teaching staff, but with a critical mass of teachers able to use technology effectively, they believed that further pedagogical change would occur in due course:

> Some teachers definitely are already there]... with other teachers and that's what I think we need to address is that they are just using it as a tool. [They might say, for example,] 'here you are - here's my little PowerPoint'. That's what they think [is effective use,] rather than the students actually being engaged – 'here is a problem. Let's brainstorm, let's find out what the problem is. Okay if we're looking at sustainability this is what, as a project team, you'd go off and look at this, you guys go and have a look at that. Then we come back'. But there are still some teachers who are using it just as a tool.

Theme 3: The role of colleagues in demonstrating technology and sharing sessions

Half of the principals described technology-pedagogy progress occurring as a result of instigating demonstrations and sharing sessions during staff meetings and other professional learning sessions. While all of these principals conceded that such sessions represented only a small step, they perceived them as necessary for ensuring that good practice could be articulated and that other, more resistant and less tech-savvy teachers could have exposure to technologies that might better support and enable their pedagogies. One regional school principal described the recent addition of the "five-minute tech tip" in every staff meeting, observing that tools were presented to staff more as suggestions than as required tools for use in their classrooms.

> One of the initiatives was that, every staff meeting now, we have a five-minute tip, technology tip. So it might be that somebody says, 'I've used this in my classroom - this is a tool you might be able to use'. They will say, 'this is what I'm using in my room, it works really well'. So it's not [like saying], 'you have to do this in your room', but 'here it is'. So the technology, I think, prior to these sessions, was a lot of PowerPoints and things just being put up on a board. So, yes [less informed teachers might say], 'I use technology because I've got a year's worth of lessons on a PowerPoint that I just roll out every day'.

The acting principal of another regional school pointed out that at their school, "we don't have a specific technology committee; we don't have any specific time set aside for professional development with computers, with technology in general". In the absence of formalised professional learning sessions, they stated, "there's no formal approach to it" - with staff mostly learning through informal classroom observation, team teaching and collegial discussions in breaks.

At one metropolitan school, the principal employed dedicated sharing sessions in staff meetings, although these were kept fairly unstructured. They maintained that given the quality of professional technology-pedagogy discussions that occurred then, "they don't have to actually have to be the structured professional learning. There's also a lot of interest in sharing different things that people are approaching in the staffroom too".

Another metropolitan school principal was unique in their "ICT snaps" sessions, where students were asked to involve themselves in staff meetings and "teach the teachers". Referring to the first such meeting they trialled, they observed that "students came and actually ran some workshop for our teachers actually shared and they ran some workshops for each other. So we did that for nearly 12 to 18 months so that staff now feel quite familiar with using technology in the classroom."

April-May, 2015: Teachers Draw Pedagogy-Technology Connections

During the School Visit Focus Groups, teachers discussed a wide range of available technologies that they used to support their pedagogies. While some of these - such as the use of tablet devices - were employed as a result school-based technology deployment, individual teachers working in their classroom contexts employed others such as the use of social media.

When the researchers explored the relationships between these technologies and the pedagogies teachers described, it was evident that the data fell into two discrete groups of technology usage:

1. The use of technologies to support teacher-centred and more "traditional" pedagogies; and
2. The use of technologies to support, enable and, in some cases, transform pedagogies.

In the first group, the uses described tended to support very traditional teacher-centred forms of direct instruction, and there was evidence that the technology had simply been fashioned or adopted to fit existing practice. Unfortunately, there was also evidence of teachers in these contexts battling very difficult student behaviour and as a result, forming views about what they could or couldn't do with the available technologies. In one school, the student behaviour was so poor that direct instruction was the dominant form of instruction, supported mainly by PowerPoint presentations and the showing of videos on smart boards.

The second group of teachers discussed the use of available technologies to support more student-centred pedagogies, including instructional models such as Project- and Inquiry-Based Learning with other important affordances such as digital creativity, online inquiry research and networking. These teachers were, in many cases, able to draw strong connections between the available technologies and their pedagogies. In some instances,

participants could also describe effectively the pedagogical change that had occurred in their classroom and in the wider school community as a result of using particular technologies.

Overall, it is important to note that the contrast between these groups was stark. In most cases, the distinctions were school-based and these concur with the earlier findings of principals' perceptions about where their school was on the journey to connect technology with effective pedagogies.

Theme 1: The use of technologies to support existing practice and teacher-centred pedagogies

The use of technologies to support the existing teacher-centred pedagogies was particularly evident in two regional schools. At one regional school, there was clear evidence of teachers working in a low-SES environment with at-times very difficult student behaviour. Most of the teachers in two focus group sessions for this school conceded that their pedagogies were teacher-centred and that this was, to a certain degree, necessary because of the environment in which they worked. While most teachers now had smart boards in their classrooms, the teachers in the focus group admitted that these were not being used well. One teacher remarked that her lessons were very "smart board-driven" while adding she tried, in spite of the students' poor behaviour, to "get them up on the board doing lots of stuff whenever I can". One other teacher said that his use of the smart board was "mainly as a projector", while one admitted that in her classroom, the smart board's use was limited to "just watching movies".

It was evident in this focus group that teachers were obviously aware of the imbalance between student- and teacher-centred pedagogies in their school. One Mathematics teacher believed, however, that there was little scope in his subject area for any use of technologies beyond those that supported "chalk and talk," stating, "I think there's a place of that chalk and talk, and I think Maths is very... would be very limited with technology". Another teacher cited the problems with teaching the Higher School Certificate (HSC) course and "getting the content done", adding that technology was seen as a "nice", though impractical option for HSC teachers:

> It would be nice to be able to do things like with this technology, but you don't have time. You've got 16 weeks to get through prelim and then you've got three terms to get through HSC and you've run out of time. You don't have time to do things like trying to incorporate technology into it because you're so rushed. You need to get content done and they need to know what they're doing.

At another regional school, there was also evidence of the less effective use of technologies, especially smart boards, as a support of more traditional pedagogies associated with teacher-centred instruction. Again, teachers in the two focus groups seemed well aware of this problem and were unabashed about naming it. When asked how most teachers in the school make use of technologies to support their pedagogies, one teacher flatly replied: "simple -

they watch *YouTube* videos on their smart boards". Reacting to this statement, another teacher argued that there had been some small behavioural gains with the addition of the electronic whiteboards: "it [the smart board] has improved the engagement of students and their interaction because, even if it's a video or something that they're watching, there's that opportunity to have the conversation and to discuss it which is more engaging than if you were just like, you know, talking from a textbook".

Perhaps unsurprisingly, at this school, classroom teachers viewed the deployment of more student-centred technologies such as tablet devices and social learning platforms as, in the words of one teacher, "a very big thing". Elaborating further, the teacher observed:

> I think the use of the iPad's a big thing. They are just able to check up on the screen, being able to use apps and things like that where kids can share, so like using, you know, flashcards, things like that. There's a big shift in our thinking with all those kinds of things. In future, we'll be using Edmodo as a tool. It wasn't great but it was another tool which just great for sharing stuff with classes.

Teachers effectively identified two noticeable barriers to using technology. One teacher described how her technology use became non-use, explaining that she and her colleagues had become so disgruntled with the capability of low-cost laptops (netbooks) that many teachers and students had stopped using them because the devices did not serve their needs. As this teacher related, these experiences had caused herself and others to form a negative view of technology in general:

> I've done a full circle in my use of technology. I use very little now, because I started off out west [working in a Western Region school] where you get everything, anything you ever wanted, that's what you get. And so I was the one promoting the little laptops [netbooks], handing them out and saying, 'this is how you use them, use them well'. So I was trying to use them as much as possible all the time just to try and see what is possible with them. So I've gone from that to a point where the school said, 'no we're not going to let the year nines have them' to where are now in Year 11, not using them there either. So we haven't had them in… we don't have them in Year 7, 8, 9, 10 or 11. None of those students have any device that we are recommending that they use during class time.

The second barrier identified by another teacher was the lack of any online Learning Management System (LMS), resulting in no centralised way for teachers and students to communicate online. Most teachers in the focus group perceived this as a problem that compounded their technology use in other areas. As one teacher observed:

> A huge barrier to us using technology is our lack of Learning Management System, which you probably know, is a big issue. We don't have *Moodle*, we're probably not going to buy *Moodle*. Nothing's ever happening anyway. We tried it but I think that, that fell down because kids stopped bringing their laptops because teachers stopped using them. So that's why that [use of technology] fell down.

Theme 2: The use of technologies to support student-centred pedagogies

In contrast, in the second group - representing five of the schools - there was clear evidence of the use of technology to support more student-centred pedagogies, especially forms of learning that were self-paced, personalised, authentic and which utilised current tools for digital creativity. As an exception to the participants who adopted mainly teacher-centred approaches in the two regional schools discussed above, one teacher at a regional school described his use of technology "for the way it's intended", implying that he felt technology needed to support more student-centred pedagogies. Offering several examples, he elaborated:

> So if you visualise, it makes sense [my use of technology]. So we use PhotoShop but we use it for altering photos for making posters and things. But that's it or like, we do the 3D printing… I haven't started that yet, that's the project for this year and that's actually part of a rich task the ACE [high ability] class in Year 7 are doing. They are designing a classroom, and I'm going to teach them how to use the 3D printer and they're going to print parts of it, like architectural models. And like, I used the smart board with my photography class so that we can work on collaborative Photoshop and things like that but I don't do the quizzes and things like that.

Teachers at another regional school had made what one teacher regarded "a small step" by digitising lesson content and then making it available through social media. This teacher felt that this was an important step in supporting more self-paced forms of learning, "providing them [the students] with a link to a worksheet or on *Facebook* - we've got both happening - so that if they don't get it [the work] the first time, they can go home and click on it".

A teacher at one metropolitan school described a similar approach through the use of *iTunes U*, again making the content available so her students could work through at their own pace. She noted, "it's been great… I think the children have really enjoyed that self-paced learning so we've had others that can go ahead and that's been fantastic". Importantly, this teacher received considerable encouragement from the principal, who had then employed the same technology to facilitate her online professional learning community.

At another metropolitan school, teachers recognised the limitations of tablet devices. As one teacher related, recent discussions with the school leaders reflected the belief that tablet devices were too limited for students in Stage 3 (Years 5 and 6) in their affordances, and that laptops were more appropriate. One teacher observed that their shared position was "that iPads are going to do a better job of personalising the learning in the lower grades and the laptops are going to do a better job of personalising the learning in the upper grades, so that's where we're moving to". The teachers were also especially keen to ensure that available technologies could support their implementation of Project-Based Learning. As one teacher noted, some tablet devices were particularly limited in their affordances for digital creativity.

Teachers at a third metropolitan school believed that technology had played a transformative role in helping them to facilitate more authentic learning for students and to move away from

textbook-driven instruction. Several teachers had embraced inter-class networking with other classrooms in Queensland, noting that the use of blogging platforms had opened up potential for students to have an authentic audience and to receive peer feedback from others outside of the school community:

> I'm finding it's adding a layer of authenticity to what's going on, what we do in the classroom has links to reality allowing the technology to bring that authenticity into the classroom, through the level of written responses we're getting. I'm in the process, at the moment, of blogging with another teacher in Queensland by showing my kids work and looking at his kids' work. We constructively criticise each other's work and then send it back.... then the kids will go and read and then work away at it and bring it back for further feedback.

Another teacher described the value of having current information at students' fingertips and contrasted this with textbooks, "sitting there and, year by year, the information gets older and older". This teacher also noted the availability of low-cost, near-professional grade tools such as music composition and recording software, with "prices [that] have come down, so much that it's almost affordable for schools to have the same suite of tools as the professional at the end of the day". Not surprisingly all teachers at this school believed that the implementation of whole school Bring-Your-Own-Device (BYOD) was reaping benefits in terms of networking, creativity and authenticity. As one teacher explained:

> The concept of bringing in your own devices is in many ways changing our pedagogy. It's all more accessible, I suppose. I asked [my colleagues] what is especially enriching as far as intellectual quality, relevance, engagement, as far as what they have used. Everyone agrees that making films, TV commercials, documentaries and presentations to showcase their learning does actually step up the learning that's happening.

June, 2015: Principals Discuss Technologies and Future Pedagogies

The final principal focus group session explored key achievements in using technologies to support, enable and transform pedagogies in each of the school communities. In general, all of the principals were able to articulate how some of their teachers were using available technologies effectively, although there was consensus that further work was needed. Interestingly, most principals conceded that technology-pedagogy achievements represented, in the words of one metropolitan school principal, "little milestones". There was general agreement that these milestones were significant in terms of realising the pedagogies needed in each school community, and that technology would continue to play an important role in the future.

Theme: A celebration of the "little milestones" and looking to the future

This principal described their "little milestones" as being reflected in a move towards more pedagogically based discussions around the use of technology in the school. As they observed,

the increase in these discussions represented a big shift, and one that was difficult to measure in quantitative terms:

> It is those little milestones that you actually hear people even talking about students like, for example one of my teachers will be talking about, 'oh I'm using this ICT in the classroom and it's not working' but, 'what have you used, can I come…?' The fact that you hear those conversations happening that they're actually talking about *teaching and learning*... to me this is evidence, you hear the kids say, 'oh, I've got to get to class we're doing such and such'. And you hear the children being enthusiastic about learning. So to me that is evidence that, you know, is not quantitative, it is qualitative and it's really hard to measure but, you know, those things to us [as principals] have sort of, shown us that yes, we're are ticking some of the right boxes.

Similarly, the acting principal of one regional school described a change in the culture of their school, with teachers utilising unstructured time - especially outside of professional learning and staff meeting sessions - to "talk technology". As they observed:

> One of the interesting things is that we found that even though they've organised a lot of professional learning the teachers are talking about more of their sharing in the staff room. It's sharing at lunchtime, you know, whatever, like 'I found this out, or I've used this'. And even though we do have quite structured professional learning framework of two sessions a term based around the ICT, it is more of the social communication between staff that is changing practice probably in the classrooms.

Another regional school principal described their school's achievements in terms of a "baseline of applications and usage across the whole school, so that people have buy in at a level that makes them feel comfortable and then set some tasks that link to classroom". Reflecting on their "tech bites" sessions in staff meetings, they conceded that demonstrations from some tech-savvy teachers "haven't translated into classroom practice [for others]". They believed that by articulating the "baseline", they would be better able to ensure that professional learning could be geared towards meeting expectations.

A third regional school principal - who had instigated the similar "five-minute tech tips" believed that their school needed to provide opportunities for deeper professional learning involving the tools being discussed. At one metropolitan school, the principal described the requirement to use technology "authentically, and as needed". Focusing on teacher-learner partnerships, they believed that students could play an important role in ensuring that technologies were used effectively, "so without that teacher *direction* as such, it's how it can be used to enhance learning".

When asked to articulate succinctly how they believed pedagogies would evolve in their school community in the coming years, the principals referred to a range of pedagogies that bore many of the characteristics of *meaningful learning* (Jonassen, Howland, Marra & Crismond, 2008), with learning that is viewed as *active, intentional, authentic, constructive* and *cooperative*. The principal of one metropolitan school saw a greater focus on "more shared, embedded practice and more collaboration around planning, teaching and learning

across the KLA". A regional school principal described the "major push at the moment on differentiation for the learners in the classroom", while another principal of a metropolitan school described a similar "push" for their staff to exercise more "critical and creative thinking, so with when they do their connected units [integrated curricula] they'll [the teachers] put a critical and creative lens over the top of their units, and then ICT will be coming in as part of that as a tool as well".

One metropolitan school principal identified the distinction between *development* and *learning* when they referred to one tech-savvy junior member of staff:

> Her skill base is that she is very tech-savvy; some people just pick it up very quickly, and she does. She's interested in learning through technology and is, I guess, one of those teachers who have moved from professional development to professional learning, in that she takes on a role on her own to find out and resource.

For another metropolitan school principal, there was a greater need to embed technology into the enacted curriculum of each classroom. They wanted "a toolbox for everyone to be able to work with and for those that are further along, you know, that high performance toolbox to allow us to be able to shape our classrooms to do the things that are needed: thinking, problem solving collaboration - both with staff and students". For the acting principal of a regional school, the main challenge involved tackling the perception of "more work" that was often attached to 'future' pedagogies. They observed that in their school, "people are only going to things that they think are going to help and improve and work for them, not something that they think is going to be more different and make their life difficult".

As Connell (2009) astutely reminds us:

> "Teachers need the capacity to research emerging knowledge, techniques and machinery that we cannot possibly define in advance, and apply them to the needs of student groups that we cannot possibly predict. Knowledge and its applications in teaching are inherently dynamic" (p.225).

The data revealed the achievements and the challenges of being able to adapt and move forward, of the value that is realised for students and teachers when their leaders promote pedagogical fluency even where they are faced with contextual and resourcing constraints. As is evident from all of the principals, a vision for future change that allows for continued development and professional learning, especially in effective approaches for new technologies, will be necessary for successful 'future pedagogies'.

12. Conclusion: Future Pedagogies

The *Future Pedagogies* project required schools to develop a vision for learning and to then transform their pedagogy though a research base. There is no one solution and real pedagogical change is much more than adopting various instructional 'models'. Change requires pedagogical fluency and a diversity of repertoire, positioned within an awareness of the contemporary context and digital age.

Loughran (2013 p.118) claims that "pedagogy needs to be conceptualised as rich, complex and sophisticated" and that it should be "viewed as **much more** than a synonym for teaching". This project has certainly confirmed these statements.

It is clear from this study that enhancing the development of pedagogies involves a complex interplay of many factors and contexts. The stories of these participant schools offer various models for considering a range of ways to build and spread pedagogy and how to implement change at a local level. They show us their plans, their attempts at innovation, their successes and their challenges, as well as providing a critical look at the pedagogies they offer their students. Their honest reflections with recognition of their strengths and weaknesses set up a pathway for future development. The nature of the educational leadership, a school's particular culture and contexts, and the identity of a professional community with a shared vision all influence the shaping of pedagogies and the activities of learning and teaching. Pedagogical change is not quickly achieved.

By looking objectively and critically at the bigger picture issues surrounding pedagogy, these schools show the need to move beyond any singular approach or limiting model. In arguing for pedagogical fluency, it is suggested that teachers should select from a broad repertoire of possible pedagogies, what is appropriate to the particular learners, outcomes, content, and context for a specific learning occasion.

Professional learning is seen here as central to the enhancement of teachers' pedagogies. Those teachers who are willing to read and update, take risks and engage with new ideas, to work collaboratively and to adopt research informed practice, appear to manage the changing demands of education in a digital age. Rather than narrowing their pedagogies, they embrace the concept of pedagogical fluency and reflect on their practice, seeking new ways to broaden their professional knowledge and technological integration. They actively question the pedagogical decisions they make, reviewing these in light of their students' achievements with peer consultation and leadership support.

Drawing upon a research and evidential base to inform pedagogical decision-making provides clear direction for change, as does a process of continually analysing and reflecting upon

students' learning progress. Thomson, Lingard, and Wrigley (2012, p.2) remind us that "all practice has embedded or explicit theory and all theory has implied and actual practice".

A school's collegial vision and contextualised educational purposes created within a strong professional learning community will be essential so that teachers are able to develop the future pedagogies and the pedagogical fluency they require for engaging and effective partnerships with their learners in rapidly changing times.

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Appendices

Appendix 1 - Common Words Removed from Word Clouds

a about above across actual actually after again against all allow allowed allowing allows already also always am an and another any anything are aren’t aren't around as at away back backed be because become becomes becoming been before being below between both bring bringing brings but by can can’t cannot can't cessnock could couldn’t couldn't did didn’t didn't do does doesn’t doesn't doing don’t done don't down during each eight else even every everyone feel feels few first five for four from further gets getting going guess had hadn’t hadn't happen happened happening happens hard hardly has hasn’t hasn't have haven’t haven't having he he’d he’ll he’s he'd he'll her here here’s here's hers herself he's him himself his hope hopefully hoping hour hours how how’s however how's i i’d i’ll i’m i’ve i'd if i'll i'm in inaudible into is isn’t isn't it it’s its it's itself i've just keep keeping keeps kind kinds know knowing knows let’s let's like liked likely likes liking link linked linking links little look looked looking looks many maybe me mean means might moment more most much mustn’t mustn't my myself next no nor not obviously of off okay on once only or other ought our ours ourselves out over overtalk overtalking own part particular particularly parts people person personal personality personally place places please pleased point pointed points probably quite rather really right said same say saying says seven shall shan’t shan't she she’d she’ll she’s she'd she'll she's should shouldn’t shouldn't show showed showing so some something sometimes sort sorted sorts still stuff such suppose sure take takes taking tell telling tells than that that’s that's the their theirs them themselves then there there’s there's these they they’d they’ll they’re they’ve they'd they'll they're they've thing things think thinks this those thought thoughts three through to too tried trying unclear under until up upon us used useful uses using very want wanted wanting wants was wasn’t wasn't we we’d we’ll we’re we’ve we'd week weekly weeks weeks’ well we'll went were we're weren’t weren't we've what what’s whatever what's when when’s when's where where’s where's whether which while who who’s whom who's whose why why’s why's will with within won’t won't work worked working works would wouldn’t wouldn't you you’d you’ll you’re you’ve you'd you'll your you're yours yourself yourselves you've

Appendix 2 - Initial December, 2014 Principal Interview Questions

Research Questions	Topics	Beginning Questions	Follow-up Questions
1. *What are the skills that enable teachers to employ pedagogies suited to the specific learners and learning context?*	**Pedagogy, teacher expertise/background, learners specific to school context**	1. How would you describe learners in your school community? 2. What kinds of expertise do teachers in your school offer? 3. What kinds of training have your teachers undertaken to enhance their pedagogies? 4. How would you describe pedagogy in your school? 5. What skills would you like your teachers to develop further?	1. What are the specific needs of learners in your school community? 2. Does anyone on staff specialise in specific pedagogical approaches? 3. What impact has this training had on your school community? 4. How do your teachers employ pedagogical approaches to meet the needs of learners in your school? 5. How will they develop these skills?
2. *How can schools develop and draw on a common language for pedagogy to establish successful learning outcomes?*	**Pedagogical approaches/frameworks, effective teaching, learning outcomes**	1. What does successful learning look like in your school context? 2. Does every teacher in the school have a shared understanding of successful learning? 3. What kinds of approaches are school-wide? What kinds of approaches are decided at the level of the individual teacher? 4. What kinds of pedagogies would you like to develop further to establish successful learning outcomes?	1. How do you know when you've been successful? 2. If so - how did you arrive at this shared understanding? If not, how would you go about developing this? 3. Why? 4. How will you do this?
3. *What are the necessary elements of pedagogical fluency and how can these be developed?*	**Pedagogical fluency**	1. What are some of the teaching and learning challenges that exist in your school? 2. How do teachers in your school employ pedagogies to address these challenges? 3. Do you think that one pedagogical model can substantially address some or all of the pedagogy-related challenges you have identified?	1. Are there challenges in specific areas, e.g. resistant staff, infrastructure, lack of knowledge, limited opportunities for PL? 2. Do you think the pedagogies they employ are effective in addressing these challenges? 3. For example, some schools employ Inquiry-Based Learning across the curriculum. Would this be suitable in your school context?
4. *What role can contemporary technologies play in developing pedagogies for current and future learning needs?*	**Technology, current and future learning needs**	1. How do teachers make use of technology to support their pedagogies? 2. How might pedagogies in your school community evolve in the future?	1. What kinds of technology tools are teachers and students using in the classroom? How do these tools enhance learning? 2. How might technology change the way teachers teach in your school in the future?

Appendix 3 - Follow-up March, 2015 Principal Interview Questions

Research Questions	Topics	Beginning Questions	Follow-up Questions
1. *What are the skills that enable teachers to employ pedagogies suited to the specific learners and learning context?*	**pedagogical skills, key members**	1. What pedagogical skills would you like to develop in your teachers during your participation in *Future Pedagogies*? 2. What do you see as being important for this to happen?	1. For example are there skills in specific areas (such as assessment, instructional approaches, specific pedagogical models, etc.)? 2. Why are they important?
2. *How can schools develop and draw on a common language for pedagogy to establish successful learning outcomes?*	**leaders and their influence, shared understanding**	1. In what ways does your school leadership team support staff when introducing a school-based change? 2. What helps you to create a shared understanding of this? 3. What challenges have you experienced?	1. Are there any other forms of support offered (e.g. release time, further training, mentoring, etc.)? 2. How do you know when you have a shared understanding? 3. How are you addressing these challenges?
3. *What are the necessary elements of pedagogical fluency and how can these be developed?*	**pedagogical fluency, future skills development**	1. What do you think it means to be "pedagogically fluent?" 2. In what ways do you try to develop this?	1. What might pedagogical fluency look like in your school? 2. Would you say that most - or all - of your staff are pedagogically fluent? Why?
4. *What role can contemporary technologies play in developing pedagogies for current and future learning needs?*	**technology, technology "drivers" and their influence**	1. Who leads technology-integrated pedagogy in your school? 2. How do they influence others? 3. In what ways has technology changed pedagogy in your school?	1. What makes them a "leader" (e.g. specific role, expertise with technology, a "go-to" person, other qualities, etc.)? 2. Are there specific things they do to share their ideas (e.g. mentoring sessions, online connections, via other leaders, etc.)? 3. For example, has technology enabled more student-centred pedagogies such as Inquiry-Based- or Project-Based Learning?

Appendix 4 - School-Based Focus Group and Final Principal Focus Group

Research Questions	Topics	Beginning Questions	Follow-up Questions
1. *What are the skills that enable teachers to employ pedagogies suited to the specific learners and learning context?*	**Pedagogy, teacher expertise/background, learners specific to school context**	1. What skills are your teachers currently developing related to the school's involvement in the project? 2. How is participation in the project changing your thinking about pedagogical skills needed?	1. What skills do you now need to address? How will you do this?
2. *How can schools develop and draw on a common language for pedagogy to establish successful learning outcomes?*	**Pedagogical approaches/frameworks, effective teaching, learning outcomes**	1. How is the team sharing ideas from their participation in the project with other staff members?	1. How are other staff members responding to the ideas shared?
3. *What are the necessary elements of pedagogical fluency and how can these be developed?*	**Pedagogical fluency**	1. What are some of the teaching and learning challenges that exist in your school? 2. How do teachers in your school employ pedagogies to address these challenges?	1. How do these challenges impact on teaching and learning? 2. How might these challenges be addressed in future?
4. *What role can contemporary technologies play in developing pedagogies for current and future learning needs?*	**Technology, current and future learning needs**	1. How do teachers make use of technology to support their pedagogies? 2. How might pedagogies in your school community evolve in the future?	1. Can you provide specific examples of technology use? 2. What changes to your pedagogies would you like to implement in future?

Appendix 5 - Future Pedagogies Evaluation Questionnaire

Future Pedagogies is a project that combines school-based research and professional learning. In developing the professional learning component of this project, we drew on the model of the self-managed school (Caldwell & Spinks, 2013). This model emphasises the important role school leaders play in responding to change and in facilitating the on-going professional learning of their colleagues. We adapted and used this model to support each school team to further develop pedagogies that will meet the evolving needs of learners in their school community.

Throughout the running of *Future Pedagogies*, we employed different forms of pedagogy-related professional learning, including presentations from keynote speakers, workshop activities, networking opportunities, school visits and a project showcase.

In this final questionnaire, we are interested in your opinion about these professional learning opportunities and your opinion of the project as a whole. The questionnaire asks you to identify the key pedagogy challenges and needs in your school community, then to rate each form of professional learning in terms of its value in supporting you to address these challenges and needs within your context. The questionnaire then asks you to respond to a short series of statements about the project as a whole. Finally, there are two short answer questions about your involvement in the project and your intentions moving forward.

As school leaders, your opinions are very important. The data gathered here enable the research team to better understand how the project has assisted each school. We are now working through the data and commencing our analysis with a view to drawing some conclusions by early 2016.

This questionnaire takes approximately FIFTEEN MINUTES to complete.

The responses you provide will be treated confidentially and the instrument has been approved by the Macquarie University Ethics Committee in the Faculty of Human Sciences and Department of Education. No personally identifying information will be published in any form. Should you have any questions, please contact Dr Kerry-Ann O'Sullivan in the School of Education, Macquarie University (Phone: 02-9850-8702).

We would like to thank you most sincerely for your time and involvement in the project.

Reference:

Caldwell, Brian J., and Jim M. Spinks. The Self-Transforming School. London and New York:Routledge, 2013.

1. Give a brief summary of the most pedagogy-related challenges and/or needs that existed in your school community at the start of the project (December, 2014). [short answer]

2. Please rate each of the following in terms of their value in supporting you to address the identified pedagogy-related challenges and needs in your school community:

Anchor points:

1 = Of no value at all

7 = Extremely valuable

(1) presentations by project leaders, system leaders, academics and other guest speakers recognised for their expertise in pedagogy;
(2) hands-on workshop activities;
(3) technology-specific instruction, especially in relation to technology requirements for school involvement in the project;
(4) informal face-to-face opportunities for networking with leaders from other project schools (e.g. during breaks);
(5) informal online opportunities for networking with leaders from other project schools (e.g. via social media);
(6) school visits, with a choice of technology-based professional learning sessions offered to regional/rural schools; and
(7) a project showcase as a forum, open to the public, for sharing project successes and challenges and promoting further discussion.

3. Please provide a brief summary of your views about your school's involvement in the project.

4. Please rate your level of agreement with the following statements about the project:

Anchor points:

1 = Strongly Disagree

7 = Strongly Agree

(1) I was fully involved in this project from start to finish.
(2) I took advantage of the opportunity to network with colleagues from other schools face-to-face during this project.
(3) I took advantage of the opportunity to network with colleagues from other schools online.
(4) There was a good balance between research and professional learning in this project.
(5) I felt supported by the project facilitators throughout my involvement.
(6) The project facilitators really took the time to understand the challenges and needs in my particular school community.
(7) The project funds were adequate in assisting us with our immediate
(8) project goals.
(9) The focus group interviews that took place during the school visits helped me to better articulate my pedagogies as an educator.
(10) The length of our involvement in the project (approx. six months) was sufficient time to allow us to make changes to pedagogies.
(11) The ideas explored and developed in the project helped me to become more pedagogically "fluent".
(12) The ideas explored in the project helped me to facilitate on-going professional learning for colleagues in my school.
(13) Through our involvement in the project, our school team was able to move in a direction we wanted.
(14) Broadly speaking, the professional learning opportunities in Future Pedagogies were superior to most other professional learning opportunities open to me.
(15) I would like to be involved in projects like this in the future.

5. Briefly explain how you plan to use ideas developed in this project in the next twelve months. [short answer]

Demographic data collected:

- Name and email (for completion registration)
- Gender
- Age
- School
- Primary/secondary
- Secondary teachers - subjects you are accredited to teach:
- Total years teaching (0 for first year)
- Years in current leadership role (if applicable, otherwise N/A):
- Years teaching at current school:
- Highest degree (Certificate, Diploma, Bachelors, Masters, Doctorate)
- Role (classroom, middle leader, school executive, principal, system leader)
- Do you currently have a teaching load? (yes/no)

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