

Networks Facilitating Change: A Case Study of an eLearning Community

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Abstract

This qualitative case study explores an elearning community project designed to address the broader issue of the lack of integration of technology into the school curriculum. The project intended to address this problem through a collaborative approach between seven secondary schools and removal of two main barriers to technology integration: lack of infrastructure and lack of support for teachers. Government funding made provision for infrastructure upgrades, laptops for student use and a learning management system for all seven schools. It also enabled the employment of a project coordinator and a team of coaches, primarily to support the professional learning of teachers. The shared approach to professional learning included pedagogy-focused workshops and follow-up support with coaches. This research contributes to the under-theorised area of emerging approaches to professional learning, including a focus on community building, peer coaching, collegial learning and collaborative projects.

This qualitative case study explores an elearning community that was established as part of the Victorian Government's Leading Schools Fund initiative. Semi-structured interviews were conducted with 14 teachers and 14 coaches from seven secondary schools that became connected through an elearning community project. The coaches were employed to support the implementation of a laptop program and learning management system, and the development of an information communication technology (ICT) rich curriculum. Insight into the factors that contribute to supporting teachers to integrate technology has been developed by way of thematic analysis of the semi-structured interview data. Firstly, the data was analysed in an inductive, data-driven way. Secondly, professional learning literature and a framework based around communities of practice theory informed the interpretation of the data.

This research explores teacher professional learning in integrating technology into the curriculum in the context of a network of secondary schools from the perspective of communities of practice theory. The theoretical framework derived from communities of practice theory guided this study in exploring teacher professional learning through concepts that are useful for thinking about learning through practice as a process of social participation. The concepts defined in the communities of practice framework provided a valuable language for the mid-level analysis conducted in this study. The framework also includes conceptualisations of the processes involved in learning in and brokering practices across communities, constellations and the landscape of practice.

This study found that a community approach to professional learning by clustering schools supported technology integration into the curriculum. It also found that shared repertoires developed in response to large-scale technology initiatives that were negotiated at the local level. This study contributes to the field of research by offering an analysis of rich data exploring the multi-tiered approach to professional learning across the network of schools that provided flexible opportunities for teachers in integrating technology into the curriculum, including coaching and in-classroom support. Factors that supported the work of coaches were practices that developed both their learning and their connections with others. This study makes a significant contribution to knowledge in understanding emerging professional learning practices in integrating technology into the curriculum. This study also makes a significant contribution to theory with the constructs of a nexus group and a cluster community.

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Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This research received the approval of the Monash University Standing Committee on Ethics in Research Involving Humans (Reference number: CF09/0980: 2009000476) and the Office for Policy, Research and Innovation, Department of Education and Early Childhood Development, Victoria (Approval number: RIS09163).

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I dedicate this thesis to my family who have supported me all throughout this journey. I love you all very much. To my loving daughter, Bodhi, I love you so much and I am so proud of you.

List of Acronyms

| | |
|---------|---|
| ACARA | Australian Curriculum, Assessment and Reporting Authority |
| AITSL | Australian Institute for Teaching and School Leadership |
| ASISTM | Australian School Innovation in Science, Technology and Mathematics |
| CPD | continuous professional development |
| DEANZ | Distance Education Association of New Zealand |
| DEECD | Department of Education and Early Childhood Development, State Government of Victoria, 2008–2014 (formerly DET 2002–2007 renamed DET in 2015) |
| DET | Department of Education and Training, State Government of Victoria, current name of department 2015–, also 2002–2007, renamed DEECD 2008–2014 |
| ICT | information and communication technology |
| ISTE | International Society for Technology in Education |
| MCEETYA | Ministerial Council on Education, Employment, Training and Youth Affairs |
| MYPRAD | Middle Years Pedagogy Research and Development |
| OECD | Organisation for Economic Co-operation and Development |
| PD | professional development |
| PLC | professional learning community |
| PoLT | Principles of Learning and Teaching |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| VCAA | Victorian Curriculum and Assessment Authority |
| VIT | Victorian Institute of Teaching |

Glossary of Terms

| | |
|-----------------------|---|
| cluster community | Cluster community has been developed as a technical term in this thesis to describe the phenomenon of a community where there is identification with the common purpose and evidence of a shared repertoire across a cluster of schools. |
| elearning | The definition used in this study is that elearning is the integration of technology and social constructivist pedagogies, including collaborative learning, into the curriculum. The use of the term in the Victorian Government education landscape of this study has influenced this definition. Of the four categories of elearning definitions identified by Sangrà, Vlachopoulos and Cabrera (2012), the one developed here would, however, fall under the educational-paradigm-oriented definitions. |
| nexus group | A nexus group has been developed as a technical term in this thesis to describe a group with the function of developing and spreading the common purpose of a community through brokering and coordination. |
| social constructivism | This is a paradigm of research that holds as a premise that social interaction contributes to knowledge creation within the context of multiple perspectives of reality. |

Chapter 1 Introduction

This chapter sets the scene for this research into teacher professional learning in a network of schools that formed an elearning community. A number of perspectives frame the introduction to this study: the research questions, motivation for the study, its positioning in the field of research and the local and global landscape. Also included in this chapter is a discussion of issues with professional development (PD) in integrating technology and the background information on the network of schools. This chapter concludes with the case supporting the significance of this study and a concise outline of the structure of this thesis.

1.1 Research Questions

This study has used qualitative methods. As the study is descriptive, exploratory and interpretive in nature, the formulation of a broad guiding question was appropriate: “What works in a learning community and why?” This thesis addressed four specific research questions that pertain to the context of the particular elearning project case:

1. How does forming a network of schools affect teacher and coach experiences of teacher professional learning in the integration of technology into the curriculum?
2. How do teachers and coaches negotiate the implementation of large-scale technology initiatives of laptops and a learning management system?
3. How do teachers and coaches working to integrate technology into the curriculum experience professional learning within a network context?

4. What factors support the work of coaches in their role to assist teachers to integrate technology into their curriculum?

An elearning community was a suitable case for exploring the complex social processes involved in teacher professional learning in integrating technology into the curriculum. A qualitative approach was the most appropriate way to explore the experiences and processes involved in situated professional learning, by way of semi-structured interviews with teachers and coaches.

1.2 Motivation for the Study

This study began with an interest in educational technology and student-centred pedagogy. As a teacher of English and humanities, I became passionate about how information and communication technology could engage some learners who otherwise found writing on paper difficult. For example, some students who were unconfident with a text-only format were able to incorporate multimedia to demonstrate their understanding. I witnessed these students feeling a sense of accomplishment with their work where previously they had little interest in trying. Through the facilitation of multimedia projects, I witnessed my students' process and demonstration of learning. However, pedagogical and relational affordances contributed to their success – technology alone was not the magic cure. Knowing my students, allowing them to negotiate their approach and being comfortable with them working beyond my technical ability contributed to their success. In this way, my teaching style incorporates a student-centred pedagogy approach influenced by constructivist methods.

My interest in adult learning developed when I taught the International Computer Driving Licence (ICDL) to teachers and members of the community. Working as the homework club

coordinator, I observed that student-centred, technology-integrated curriculum was only enacted to the extent that teachers facilitated this. Teacher professional learning teams were emerging in school structures and I enjoyed engaging with my colleagues to better my teaching and to develop curriculum. Having observed the impact of teachers' pedagogical approaches on student engagement and learning first-hand, I became interested in making a difference through teacher professional learning. Completing my master's degree with a specialisation in information and communications technologies in education resulted in a broad understanding of educational technology theory.

It was serendipitous that a number of positions were advertised for teacher coaches in a new elearning community project. It would have been interesting enough to work in one school in such a role. However, I was ecstatic to have the opportunity to work as a network-based coach, as I was really interested in being able to have a bird's-eye view of what would be happening through this initiative across seven schools. I experienced the synergy of a group of enthusiastic coaches, headed by a project coordinator who was able to see the strengths of each team member and inspire their contributions. It occurred to me that I was located in the ideal setting to explore what was going on in this community of schools through a PhD research study. I have conducted this study to theorise my "intuition" that the community approach to professional learning in this setting was empowering teachers to integrate technology into their curriculum and embed this in their classroom practice. I originally used the word "hunch" instead of "intuition". I then revised this to "intuition" to formalise the language I was using. I then came across a reference that stated research begins "with a hunch or question" (Gable & Rogers, 1987, p. 692). Leaving fears of informality behind, this research has come about due to my interest in educational technology, teacher professional learning and the role of community in knowledge building.

1.3 Positioning the Study in the Field of Research

This study sits within the nexus of three main fields of research (see Figure 1). The first is the field of research about computing in education (Impagliazzo & Lee, 2004)—now more commonly referred to as educational technology (Reiser & Ely, 1997). The second is teacher professional development—increasingly referred to as teacher professional learning (Doecke, Parr, & North, 2008; Jensen, Sonnemann, Roberts-Hull, & Hunter, 2016; Timperley, Wilson, Barrar, & Fung, 2007). The third is theorisations around communities of practice (Lave & Wenger, 1991; Wenger, 1998; Wenger, McDermott, & Snyder, 2002; Wenger-Trayner & Wenger-Trayner, 2015).

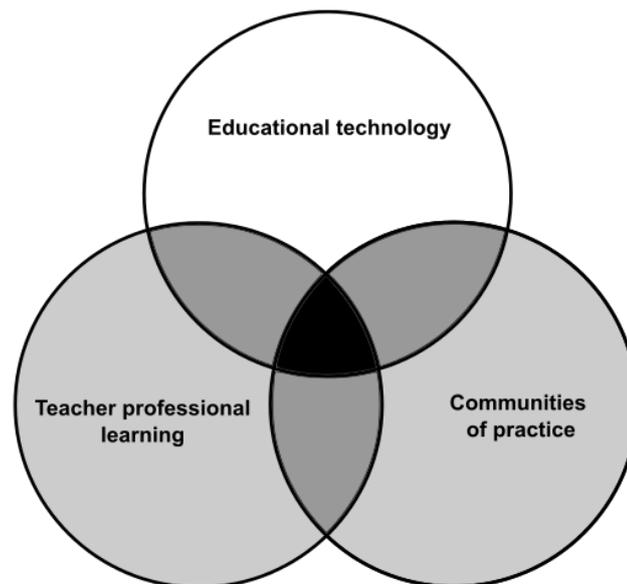


Figure 1. Scoping This Study in the Nexus of Educational Technology, Teacher Professional Learning and Communities of Practice Research

There are three relevant points that clarify the positioning of this study at the nexus of educational technology, teacher professional learning and communities of practice research.

Firstly, this study does not focus on research that is broadly about educational technology that excludes teacher professional learning and communities of practice (indicated by no shading of this section of Figure 1). Secondly, professional learning in integrating educational technology could be considered a field of research in its own right (K. Cole, Simkins, & Penuel, 2002; Downes et al., 2001; Mouza, 2003); however, it would be limiting to overlook the theoretical gains made in the field of teacher professional development and learning in general (Bell & Gilbert, 1994; Darling-Hammond & Ball, 1998; Hawley & Valli, 1999; Little, 1993; Timperley et al., 2007). Therefore, this study includes in its contextualisation, theorisations and empirical studies that include professional learning that may not have a specific focus on educational technology (indicated by the lighter grey shading in Figure 1). Thirdly, communities of practice theory has gained traction in research into teacher professional learning (Glazer, Hannafin, Polly, & Rich, 2009; Hartnell-Young, 2006; Henderson, 2007; Khalid, Joyes, Ellison, & Karim, 2013; Sailin & Henderson, 2012; Schlager & Fusco, 2003; Schlager, Fusco, & Schank, 2002). Research in the field of communities of practice (Brown & Duguid, 1991; Cox, 2005; Davies, 2005; McDermott, 1999) that does not have a specific focus on educational technology or teacher professional learning research is also within scope, where the inclusion adds to the theoretical development of the study (also indicated by the lighter grey shading in Figure 1).

The assumption that technology will bring extreme positive or negative change is one criticism raised in relation to educational technology research. Selwyn (2014) warned about technological determinism, where the researcher relies on the “orthodoxy that technology is a potential force for positive change” (p. 12). This, however, “does not imply that we need to adopt a nihilist negativity with no hope or purpose” (Selwyn, 2014, p. 19). These polar positions were also considered by Mehan (1989), who concluded:

I am inclined to dismiss the two prevailing views about computers in schools (i.e., computers will revolutionize education and school culture will suppress innovation because they treat computers as technology). In their place, I recommend that we adopt a perspective that characterizes computers as social practice. When we do, the relationship between classroom organization and computer use becomes mutually influential, not overly deterministic. (p. 19)

This study avoids the extremes of determinism and nihilism in educational technology research by adopting Mehan's (1989) perspective of computers as part of social practice. Further to this, broadening the scope of literature to professional learning that does not focus on educational technology exclusively, this study avoids being relegated to, in the words of Selwyn (2014, p. 12), the "curiously closed" one of educational technology.

Further explanation is warranted in the scoping of this research because "educational technology' is not itself a coherent field of study" (Selwyn, 2012, p. 6). This is not research that examines whether the use of particular technology is effective, thus avoiding the "risk of confusing delivery mode with instruction strategies" (Ross, Morrison, & Lowther, 2010, p. 24). Consideration of the technical aspects of setting up online communication systems is also outside of the scope of this research. This research focuses on the teacher and coach experience in a specific elearning project that had the end goal of integrating technology into the curriculum in a landscape of practice that promotes constructivist pedagogical approaches, encapsulated by the term student-centred learning.

Another problem for educational technology research is the pressure for it to resolve the broader problems of politics and inequality in society. Selwyn (2014) challenges researchers to

consider some of the more difficult questions regarding the politics of technology and the inequality which surrounds it. Indeed, the issue of unequal access to technology remains unresolved (Selwyn, 2014; Selwyn, Gorard, & Williams, 2001; White, 2004). The project funding was a response to bridging the inequity within the community involved, although this study does not directly aim to address this issue. This study does not specifically focus on “digital technology as part of the complex ways that social, economic and political tensions are ‘mediated’ in educational settings” (Selwyn, 2014, p. 4). This study is, however, contextualised within these broader issues in relation to its specific context questions and theoretical framework. Selwyn (2014) also suggested researchers “ask questions about how technology is being used in practice” as opposed to “how technology *could* and *should* be used” (emphasis in original, p. 15). This research is not a hopeful account of a promising future but, rather, it focuses on how teachers experienced the complex social interplay involved with professional learning in integrating technology into their classrooms.

The literature about professional learning is problematic in that much of the research focuses on specific programs and activities far removed from the teaching environments. In their literature review, Opfer and Pedder (2011) found the field dominated by research focusing on teacher professional learning as “specific activities, processes, or programs in isolation from the complex teaching and learning environments in which teachers live” (p. 377). To address this, researchers need to consider “a more complex conceptualisation of teacher professional learning” and “methodological practices that focus on explanatory causality and the reciprocal influences of all three subsystems” (Opfer & Pedder, 2011, p. 376). These three subsystems are the teacher, the school and the activity. Notwithstanding the value of a focus on the individual teacher and

classroom levels of analysis of professional learning, this study zooms out to consider a broader view.

The inclusion of the context has also been considered an aspect worthy of investigation of professional development programs. Yates' (2007) framework included the facilitators, the professional development program and the teachers as a triad for investigation along with the "context" (p. 4). The analysis of research studies included single site with a focus on teachers as the learners, multiple sites with the same facilitator and multiple programs across multiple sites. The analysis of research into multiple programs across multiple sites studied "the relationships among all four elements" (p. 4). Yates (2007) recommended further research into multiple programs across multiple sites to "explore the trade-offs between fidelity and adaption that are necessary to ensure program effectiveness across multiple settings" (p. 13). There are also studies that have considered the context as a larger system than the school. A large-scale Australian research study identified a broader system of levels in considering professional learning: "system-wide, school and individual levels" (Doecke et al., 2008, p. xiii). The current study considers a network of schools as another level for analysis when considering teacher professional learning.

Selwyn (2012) proposed "approaching the topic of education and technology in *relational* terms" by including at least three different levels of description: the micro, meso and macro levels (emphasis in original, p. 13). With consideration of the possible levels for a study into teacher professional learning, Figure 2 depicts the contextualisation of this study within system levels.

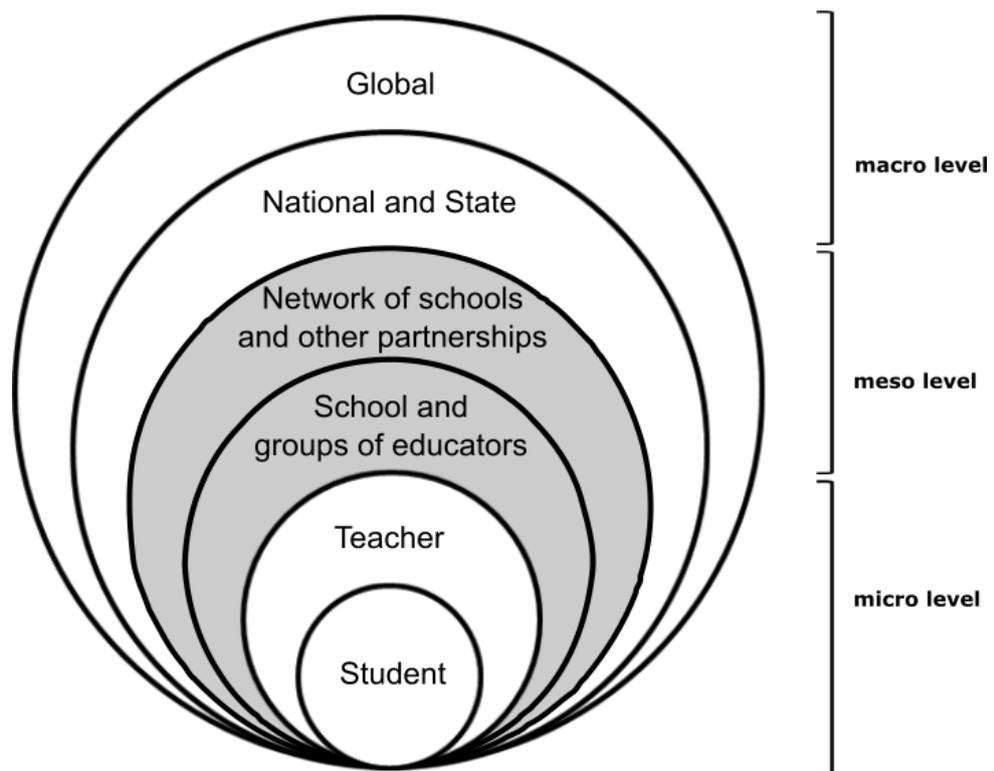


Figure 2. Level of Analysis of This Study Within Systems

The focus of the analysis of this study within system levels is the meso level. The macro level is the broader “ecosystem” (Zhao & Frank, 2003) “of wider cultural, societal, political and economic values” (Selwyn, 2012, p. 13). Mason (2008) considers that causes for change in a school “would include factors associated with the state and its education and economic policies, and possibly factors even beyond the grasp of the state— those that are associated with the forces and consequences of globalisation” (p. 45). The macro considerations have influenced this study in relation to the impetus for professional learning in the integration of educational technology in policy, curriculum and funding agendas. The meso level includes “the processes and procedures of educational institutions” (Selwyn, 2012, p. 13). In this study, the meso level includes a network of schools working together in a government-funded project. To a lesser degree the micro level of “the individual learner and tutor” (Selwyn, 2012, p. 13) is considered in relation to the teacher-

participants of this study and their students through the teachers' experience with them. By contextualising this research between the macro and micro levels, this study has aimed to achieve "a rich and nuanced understanding" (Selwyn, 2012, p. 13) of the "intimate connectedness with the substantive" (Webster, 2005, p. 453). In other words, this study is a mid-level analysis, neither a grand narrative nor an isolated ethnography, in its contextualisation within systems.

One problem in the professional learning literature is the abundance of field guide-like handbooks on how to build a professional learning community (PLC). Servage (2008) identified that "popular professional literature about collaborative models embodies hope for profound and positive change to emerge from shared professional learning" (p. 64). The problem with popular professional literature is that "what schools are transformed into is not really articulated beyond the idea that whatever happens in a PLC should further student learning" (Servage, 2008, p. 65). The folkloric nature of this rhetoric around professional learning communities could be addressed by research seeking to understand the process of transformation that takes place in a community of teachers through focusing on the "transformative learning" (Mezirow, 1997) at the level of the individual teachers (Servage, 2008). This study explores the transformation of teachers in a community engaged in professional learning in integrating technology.

This study focuses on the group of schools, the school-level implementation and the approach to teacher professional learning presented in the unique case of the elearning community project through the experiences of 28 teacher and coach participants. With consideration of the issues surrounding professional learning discussed in this chapter, the literature review in chapter two explores multiple juxtapositions of emerging approaches to professional learning. This research expands on what constitutes professional learning in its consideration of the project's community approach to workshops, coaching and collegial interactions.

This research considers the complexities of the social aspects of teacher professional learning in drawing on communities of practice theory to investigate a multiple-school context. The social theory of learning (Wenger, 1998; Wenger-Trayner, 2013) behind communities of practice theory is congruous with the social constructivist paradigm (Berger & Luckman, 1991; Dewey, 1916; Huysman, 2002; Vygotsky, 1978) of this study. Studies not specifically concerned with integrating educational technology in the classroom that offer relevant constructs regarding communities of practice theory as a theoretical framework or used in the design of the learning approach are included. Chapter three scopes the framework for communities of practice theory for this study.

There are three main phases of the development of the social learning theory developed around communities of practice concepts (Omidvar & Kislov, 2014; Wenger, 2013). Wenger-Trayner described the origins and evolution of the theory of communities of practice in three phases in an interview published in a journal article by Omidvar and Kislov (2014). The first phase of the theory focused on the concept of legitimate peripheral participation to describe the way an individual learns via their increasing membership in a community of practice. The theory, with its origins in situated learning (Lave & Wenger, 1991), is appropriate for this investigation into teacher learning in the workplace of schools. The second phase of the theory expanded the concept of communities of practice (Wenger, 1998) through relatable descriptions of learning through social interaction in the work environment of claims processors at the insurance company Alinsu (the pseudonym used by Wenger). This second phase of development is most relevant to this research in its exploration of how teachers learn through informal and formal modes. Aspects of the Wenger et al. (2002) application have been included in the discussion in considering how communities of practice could be cultivated. The third phase of the theory, Wenger-Trayner and

Wenger-Trayner (2015) shift the focus to an individual moving through multiple communities of practice across learning landscapes.

This section has positioned this study in the nexus of the educational technology, professional learning and communities of practice research. The next section explores the local, national and global landscape influencing policy in education.

1.4 Local, National and Global Landscape

The policy document pivotal to this study is the *Blueprint for Government Schools: Future Directions for Education in the Victorian Government School System* released by the Department of Education (DET, 2003). The Blueprint's seven flagship strategies shaped Victorian education from 2003 to 2008 (DET, 2003). The first six flagship strategies focused on student learning, resource allocation, building leadership capacity, performance and development culture, teacher professional development and school improvement (DET, 2003). The seventh flagship strategy, the Leading Schools Fund, was recognition that "one size does not fit all" for meeting the diverse needs of students, and so innovative and context-tailored solutions were needed (DET, 2003, p. 26). The elearning community project involved in this research was a result of funding under the Leading Schools Fund component of the Blueprint.

Increased funding for infrastructure, curriculum development initiatives and strategic partnerships was allocated to the Victorian school system prior to and during the project studied in this research. The Victorian Government had already increased its investment in education and training to \$3.69 billion over the period 1999–2003 (DET, 2003, p. 8), supporting then Minister Kosky's claim that education was "the number one priority" (DET, 2003, p. 2). Although

improvement in national and international literacy and numeracy tests was impressive, further focus on some groups of students with poor levels of literacy and secondary school absenteeism was needed (DET, 2003, p. 2). The Minister also noted “high variations in outcomes between classes within schools and between schools with similar student populations” (DET, 2003, p. 2). The disparities in student outcomes were addressed through a new curriculum later released as the Victorian Essential Learning Standards (VELS), the development of Principles of Learning and Teaching (PoLT), a shared knowledge bank (online) and multiple strategies for building leadership capacity and teacher professional learning. The Blueprint policy formalised a culture of cooperation between government, schools and the wider community. The development of the VELS curriculum and PoLT improved teaching agendas and so warrants some further discussion here to highlight the multiple change programs in the broader education context at the time of the formation of the elearning community.

The Principles of Learning and Teaching (PoLT) framework conceptualised in the Blueprint is a set of six principles guiding teacher practice to promote improvement in the following areas:

1. The learning environment is supportive and productive
2. The learning environment promotes independence, interdependence and self motivation
3. Students’ needs, backgrounds, perspectives and interests are reflected in the learning program
4. Students are challenged and supported to develop deep levels of thinking and application
5. Assessment practices are an integral part of teaching and learning

6. Learning connects strongly with communities and practice beyond the classroom
(DET, 2014)

Interestingly, the PoLT framework included recognition of the importance that “learning connects strongly with communities and practices beyond the classroom” (DET, 2014). PoLT was an evolution arising from the 2003 Middle Years Pedagogy Research and Development (MYPRAD) framework. The MYPRAD framework was trialled by nine school clusters and then released to all Schools for Innovation and Excellence clusters (DET 2013b). MYPRAD schools could continue to use the existing framework or convert data collected for longitudinal purposes to the PoLT framework. PoLT was a tool designed for schools to audit their pedagogical practice and to support and sustain change. By March 2004, the PoLT framework was available to all schools. An evaluation report was commissioned by the Department of Education and Training on the Schools for Innovation and Excellence (SIE) initiative (Ingvarson, Khoo, Beavis, & Meiers, 2005). The SIE evaluation informs this study because it reports on the Victorian Government cluster initiative to improve learning through collaboration between schools.

During the time of the elearning project case explored in this research, a new curriculum that included teaching and learning standards was developed based on research funded by the Victorian Government. The Victorian Essential Learning Standards (VELS) were released in 2006, via the statutory body the Victorian Curriculum and Assessment Authority (VCAA), building on the previous curriculum standards frameworks with the addition of interdisciplinary strands of learning to accompany the key learning areas (VCAA, 2015). “ICT for thinking, creating and presenting” was one of the interdisciplinary strands to be integrated across other learning domains (VCAA, 2007). The curriculum specificity of integration of technology across

all subject domains was one of the government priorities that influenced the landscape during the time of the project that forms the case for this study.

In line with global trends, the Australian Government has developed policy, charter and standards with the aim of improving student educational outcomes through teacher professional learning. Evidence that the Victorian Government has continued to recognise professional learning as essential for capacity building in the teaching profession is the setting up of the teacher registration body, the Victorian Institute of Teaching (VIT). Its role is to maintain the registrations of teachers and this now includes requirements for teacher to maintain their professional practice (VIT, 2015). Delivering professional development, attending meetings, mentoring and supervising pre-service teachers are also recognised for the purpose of maintaining professional practice alongside workshops, conferences and qualification courses (VIT, 2015). Teachers must map their professional learning activities against the Australian Professional Standards for Teachers (VIT, 2015) developed by the Australian Institute for Teaching and School Leadership (AITSL). These professional standards are grouped into three broad categories: professional knowledge, professional practice and professional engagement (AITSL, 2014b). The Victorian Government endorses professional learning for teachers that aligns with the Australian Professional Standards for Teachers.

The policy mandate for teachers to integrate ICT into the curriculum is still a national priority in Australia. Since 2009, the Australian Curriculum, Assessment and Reporting Authority (ACARA) has been responsible for leading the collaborative endeavour of producing and implementing the Foundation to Year 12 Australian Curriculum (ACARA, 2013a). The Australian Curriculum is guided by the Melbourne Declaration (ACARA, 2013b). The Australian Curriculum specifies general capabilities to be incorporated in the context of the learning areas

(ACARA, 2013b). It is through these general capabilities that the goals of the Melbourne Declaration—“that all young people in Australia should be supported to become successful learners, confident and creative individuals, and active and informed citizens” (p. 8) as determined by the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA, 2008) are realised in the curriculum (ACARA, 2013b). Accordingly, the general capabilities include literacy, numeracy, information and communication technology (ICT), critical and creative thinking, personal and social capability, ethical understanding, and intercultural understanding. It is the expectation that teachers must incorporate ICT across all subjects of the Australian Curriculum (Buchanan, Holmes, Preston, & Shaw, 2015). This development demonstrates that ICT is still a national priority in the current curriculum.

The companion document to the Melbourne Declaration expressed the commitment of Australian governments in “ensuring learning in the senior years is supported by access to computers, online tools and resources, and teaching expertise in using information and communication technologies (ICT)” (MCEETYA, 2009, p. 12). In order to achieve the objectives of the Melbourne Declaration, the Australian Government is looking to teacher professional learning as the answer (AITSL, 2012). The Australian Charter for Professional Learning for Teachers and School Leaders was developed along with the Australian Professional Standards for Teachers (AITSL, 2012). These policy documents demonstrate that teaching capacity and professional learning for teachers are still high on the agenda. The Australian Government has acknowledged that community learning and coaching are important forms of professional learning for teachers; however, little research has been done in this area (Mayer & Lloyd, 2010). The policy into practice approach reflected in Australian and Victorian government policies, standards and research is reflective of global trends.

International bodies such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Organisation for Economic Co-operation and Development (OECD) have identified teacher professional learning in integrating technology as a high-priority need. A 2001 survey of 4,000 upper secondary schools in 14 countries indicated that although many teachers participated in ICT professional development the use of ICT in classroom instruction was limited (OECD, 2004). The OECD (2004) expected teachers to need more ICT professional development over time, with the focus shifting from skills to the pedagogical aspects of integrating ICT in the curriculum. This prediction was correct; in the 2008 Teaching and Learning International Survey, 74,000 lower secondary teachers from 23 countries ranked ICT teaching skills as the second-highest priority out of eleven areas of professional learning need (OECD, 2009). The OECD (2009) reported that more than half of the teachers surveyed did not believe their professional learning needs were being met in terms of content or amount attended (OECD, 2009). The types of professional learning teachers have participated in most often do not include the approaches that research reports as effective (OECD, 2009). UNESCO (2011) developed the ICT competency framework to assist countries in developing standards that include “teachers being able to help the students become collaborative, problem-solving, creative learners through using ICT so they will be effective citizens and members of the workforce” (p. 3). UNESCO (2014) and OECD (2009) have recommended a policy and practice approach to improve teacher competency in ICT to governments globally.

1.5 Issues With Professional Development in Integrating Technology

One issue with early implementation of computers in schools was that usage was “associated with very specific or narrowly defined tasks: students, for example, might go to the computer lab to practice addition on a math program; a whole class might spend an hour in the

computer lab to type their final paper” (Hucks & Ragan, 2013, p. 65). Just providing technology to teachers has not led to effective technology integration in the curriculum for improved student learning (Hennessy, Harrison, & Wamakote, 2010; Hucks & Ragan, 2013; Lane, 2012; McGrail, 2007; Mouza, 2003). Lane (2012) has challenged the “expectation that when teachers are provided with computer equipment, they will replace the old ways of teaching with new approaches” (p. 59). Fitzallen and Brown (2005) conducted a study involving teaching staff in a Tasmanian suburban high school and identified that the problem with skills-based ICT professional development is that it is not translated into transformative pedagogy. Professional learning beyond skills-based technology training is needed for success in integrating technology into the curriculum (Hucks & Ragan, 2013; Lane, 2012; McGrail, 2007).

Some researchers have promoted pedagogy-focused professional development (Fitzallen & Brown, 2005; McGrail, 2007; Moyle, 2006). Fitzallen and Brown (2005) argued that it is increasingly accepted that “Information and Communication Technologies should contribute extensively to pedagogical practices in order to address the needs of learners in contemporary society” (p. 1). McGrail (2007) also added that for teachers to be able to embed ICT in their practice, professional learning must focus on a changed teaching approach and curriculum redesign is required. Shi and Bichelmeyer (2007) compared findings from two ethnographic studies to discover how teachers’ experiences of computers had changed since an increase in the ratio of computers to students. The barriers to technology integration such as “lack of effective training, and the need for collaboration and involvement in planning for computer use” (p. 180) in the 1999 study were still present in the 2004 study. These studies support the need for professional learning for teachers to make the pedagogical shift towards student-centred learning and integration of information and communications technology in the curriculum. It is no surprise

that professional learning that focuses on the technology, rather than its educational application, is unable to affect pedagogy.

Even when pedagogy is considered, one-off workshops or conferences in isolation have received much criticism for not achieving transformation in practice (AITSL, 2012; Bell & Gilbert, 1994; P. Cole, 2005; DET, 2005b; Mouza, 2003; OECD, 2009; Timperley et al., 2007; Yates, 2007). Teachers from most countries in the OECD (2009) reported that education conferences were one of the less effective types of activities. Fullan (2007) argued that external ideas stemming from professional development activities of this kind are “not specific enough, or sustainable enough” (p. 35) to bring cultural change in classroom practice. This is because externally provided professional development sessions are not tailored to the complex needs, experiences and the context of teachers’ work (P. Cole, 2005). Research confirms that for teachers, long-term activities that have a specific focus are more effective professional development than short-term events (OECD, 2009; Yates, 2007). Apart from returning to school with initial enthusiasm, teachers are unlikely to transform learning into a change in their technology integration practice in the classroom.

One problem with integrating technology is the lack of professional learning opportunities for teachers relevant to their context (Cuttance, 2001). A significant investment in time and finance is allocated for teachers to participate in professional development, however there may be a mismatch in the types of professional development provided and what teachers perceive they need (OECD, 2009). The OECD (2009) suggested that “carefully comparing provision and support with development needs should be a priority in many participating countries” (p. 79). Hucks and Regan (2013) suggested that teachers need “professional development with a focus on meaningful and targeted application of the tools and resources that they currently have access to”

(p. 65). They also encouraged “spaces for collaborative practice focused on technology” and claimed “the positive and constructive impact this will have on teaching and learning is powerfully transforming” (p. 75). This study contributes to understanding alternative ways that collaborative practice around technology integration on-site and specific to the resources available can take shape.

The complex processes and context are often ill considered by research when professional learning equates to simple activities. Opfer and Pedder (2011) rationalised the high volume of research that characterises professional learning as ineffective as attributable partly to “researchers employing simplistic conceptions of teacher professional learning that fail to consider how learning is embedded in professional lives and working conditions” (p. 376). Integration of technology into the curriculum requires a whole-school approach driven by school principals as the curriculum and pedagogical leaders, according to a survey of over 400 Australian school leaders (Moyle, 2006). A finding of the study by Moyle (2006) of value to this research is that:

Professional learning was consistently raised as being critical for both school leaders and teachers, to enable them to integrate ICT into teaching and learning. The majority of the professional learning concerning ICT was reported as being school-based and often self-directed. A current complexity for school leaders and those organising professional learning activities in schools however, is that not all staff are at the same stage of “ICT development”. (p. 52)

A “one-size-fits-all” approach to professional learning is therefore not a suitable solution (MacDonald, 2009, p. 327; Moyle, 2006, p. 22). Instead, “varying types of in-school professional

learning” were identified as “required to meet the different requirements and stages of learning evident in a school staff” (Moyle, 2006, p. 22). This research expands on the learning of Moyle’s (2006) study by exploring multiple approaches to professional learning developed to suit a particular context.

This finding was also supported in the mixed-methods study on supporting learner-centred ICT integration by MacDonald (2009). The “theme of needs-based professional development” was supported by both statistical data (based on 608 surveys) and interview data (MacDonald, 2009, p. 327). One comment representative of this theme expressed by a teacher in MacDonald’s (2009) study was “I do not think we can plan for the large group. I think we have to plan for stratification, for the differentiation among teachers” (p. 327). The elearning community project, being the subject of the present study, was a response from the government that acknowledged that innovative approaches for particular local contexts were best conceptualised and developed within the context. The approach may be considered learner-centred in that the professional learning offered tailored programs and individual support as opposed to a one-size-fits-all program.

In recent years, at the policy level, broader consideration is being given to what constitutes effective professional learning (AITSL, 2014a; Beglau et al., 2011). There is now more emphasis on the informal, collaborative and coaching approaches (AITSL, 2014a; Beglau et al., 2011). A recent AITSL (2014a) study identifying exemplary cases of professional learning reported that the most innovative examples were self-directed, collaborative and informal (p. 15). AITSL (2014a) reported that “the features associated with agency of the individual in the choice and focus and design of their professional learning ... are well represented” (p. 16). In Australia, school networks or clusters have been identified as a way for schools to work together on innovative

approaches to enhance student outcomes (Ingvarson, Khoo, et al., 2005). School cluster arrangements have been most effective in improving student outcomes through improvements to teaching quality that are related to “leadership support, the amount of cluster-based PD, the strength of the cluster identity and the level of cluster activity” (Ingvarson, Khoo, et al., 2005, p. 10). This study contributes to the field in researching the practices of a broader definition of professional learning with a multiple school network or cluster context.

At the time of initiating this research, projects facilitating collaboration between schools to build teacher capacity and improve student opportunities were being funded, in pilot projects at least, and the opportunity for research in this emerging field of study arose. Research into the Australian Government Quality Teacher Programme (Doecke et al., 2008; Ingvarson, Meiers, & Beavis, 2003, 2005) and Schools for Innovation and Excellence Clusters (Ingvarson, Khoo, et al., 2005) with a focus on professional learning in school networks were released and inform this study. This study also draws on findings informed by case studies of 16 exemplar Australian School Innovation in Science, Technology and Mathematics (ASISTM) school cluster projects and the resulting innovation framework developed (Tytler, Symington, Smith, & Rodrigues, 2008). An evaluation report was prepared on the Leading Schools Fund initiative by Russell, Cotter and Keating (2009) of the University of Melbourne for DEECD; however, this report has never been made public (personal email communication, Jean Russell, 22 Novemebr 2015). My research will make available findings from one Leading Schools Fund project where schools jointly engaged in a project to increase teacher capacity in integrating technology.

1.6 Background to the Research Setting

The setting for this research is a project that included seven secondary schools that became linked as an elearning community through government funding to implement a technology-rich curriculum through the provision of infrastructure, supported by coaches. The initial conceptualisation of the Leading Schools Fund was “a school transformation and renewal initiative run by the Department 2003–2008” (DET, 2013a). The fund provided “\$82 million for an extra 450 teachers in government secondary schools (Investing in Teachers to Support Excellence) and \$80 million in capital for new specialist facilities (Investing in Facilities to Support Excellence)” (DET, 2003, p. 26). The reach of the funding was “162 schools with a secondary component, representing approximately 50% of secondary schools in Victoria” (DET, 2013a). The intention of the Leading Schools Fund was to “facilitate strategic partnerships and collaboration between schools so that schools can learn from each other, assist each other and strengthen the government school system” (DET, 2003, p. 7). My research focuses on a single Leading Schools Fund project that proposed to become “a model cluster of schools, informed by current research, which fully capitalises upon the integration of ICT as a tool in every classroom” (DET, 2004, p. 9).

The Leading Schools Fund proposal described the elearning community’s strategy as “the development and implementation of an *e-rich environment* to drive significant improvement in Teacher Effectiveness and School Effectiveness” (emphasis in original, DET, 2004, p. 8). The basis for this aim was to address the inequality of opportunity identified in the urban–rural fringe student population, compared with other clusters closer to the capital city. The project proposal flagged that this geographical area had a “high proportion of residents with no educational/tertiary qualification; high unemployment and a high proportion of people earning under \$300 per week”

(DET, 2004, p. 4). The community was also identified by the Australian Bureau of Statistics (ABS) as having “low levels of computer use and Internet home access” (DET, 2004, p. 4). The proposal anticipated that a collaborative response to building the capacity of teachers would lead to increased student engagement, retention and future opportunities.

The elearning community project aimed to create an e-rich learning community with the broad purpose of creating better outcomes for students. The seven schools committed to five key goals in the project proposal:

Goal 1: Provide a quality learning environment

Goal 2: Promote excellence in all aspects of student learning

Goal 3: Deliver quality teaching and professional development in all learning areas

Goal 4: Streamline administrative, communication, record keeping, reporting and student attendance by using ICT

Goal 5: Involve the wider educational community and general community

(DET, 2004, pp. 10–12)

Funds were also contributed by the Broadband Innovation Fund (BIF) as well as funds pledged by the seven secondary schools as part of the proposal. In total, the project attracted over \$12 million in funding (Department of Infrastructure, 2004, p. 2). According to the project region report, this funding provided for 13 full-time equivalent staff (12 positions to form an educators’ group and one technical support person), infrastructure upgrades, one laptop computer for every two students in years seven and eight and a learning management system (DET, 2005a, p. 1).

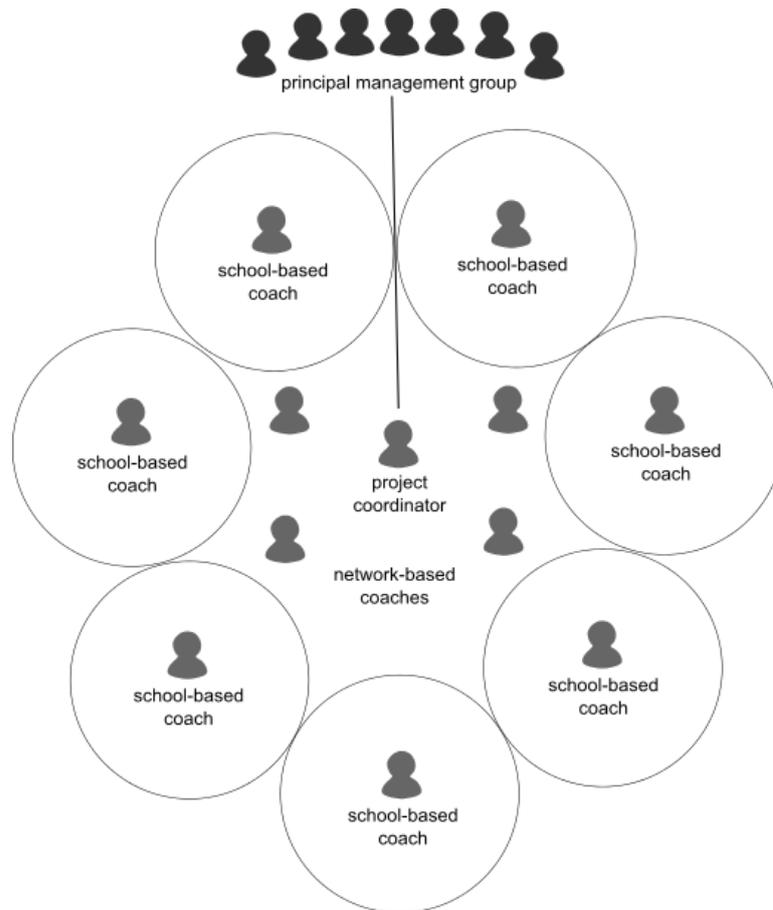


Figure 3. eLearning Community Staffing Structure

This research focuses on the networking between schools, professional learning for teachers and involvement of the educators’ group, referred to in this study as the Project Team. The Project Team was the group of staff funded to provide support for teachers, namely, the project coordinator, network-based coaches and school-based coaches responsible for the implementation of the project in their day-to-day work. In this study, Project Team members are referred to by the following descriptors for their roles: project coordinator, network-based coach and school-based coach or coach more generically (see Figure 3). The Principal Management Group was the equivalent of a board of directors for the project. The school principals were not directly involved in this study, although they did give permission for it to proceed.

The project proposal, in naming the cluster of seven schools an elearning community, positioned seven schools to form a community from the outset. The purpose of the positioning of the seven schools as a community was to strengthen the vision of integrating technology in schools by “the vigorous promotion of cooperation and sharing between schools” (DET, 2004, p. 8). This project by design intended to realise the benefits of more than one school working together to achieve the same goals by sharing their experience and resources. The vision included a focus on changes in curriculum delivery to embrace the use of technology: “The program will encompass innovative curriculum and curriculum delivery, will challenge and stimulate students, staff and school communities, and reinvigorate schools’ pedagogies” (DET, 2004, p. 8). In this study, innovative curriculum includes the theorisations of personalised learning, collaborative learning and student-centred learning that take into account the diverse needs of students that were the prevailing pedagogies recorded in policy and curriculum documents at the time.

1.7 Significance of This Research

This study is important because traditional professional development has not been meeting the needs of teachers in negotiating the changing landscape of schools under policies that require technology to be integrated into the curriculum (Beglau et al., 2011; OECD 2004). Inadequate progress towards ICT integration in schools has strengthened the argument for further research into how professional learning affects change in teaching practice. Professional learning in integrating technology into the curriculum needs to be reconceptualised as both situated and dynamic. This research contributes to this gap in research by exploring a multi-tiered model of

professional learning in integrating technology, in a particular network of schools, using communities of practice as a framework for investigation.

This research addresses the need to further explore alternative approaches to professional learning that take into account the social nature of learning. This has been achieved by way of a case-study approach exploring a government-funded school cluster project, which enabled seven schools to work together as an elearning community. The project implemented a combined workshop and coaching approach to professional learning, aimed at enabling teachers to make the shift to facilitating student-centred technology-integrated curriculum in their classrooms. This study focused on the experiences of 14 teachers and 14 coaches, working together during a three-year project, as they approached the challenge of integrating student-centred pedagogy and technology. This thesis contributes to this end knowledge by extending the investigation into a community approach to teacher professional learning.

Communities of practice theory (Wenger, 1998) was chosen as a way to frame this research because it is based on the premise that learning is a social activity. By using communities of practice theory as a framework for analysis, insight has been developed into how teacher professional learning—with a combination of workshops and in-classroom support to integrate technology into the curriculum—may be understood. The concepts of “brokering” (Wenger, 1998) knowledge between communities of practice and “technology stewarding” (Wenger, White, & Smith, 2009) have provided theoretical bases for viewing the engagement of the coaches in sharing practices in the elearning community. Later developments such as a focus on “learning in landscapes of practice” are included in the framework for this study (Wenger-Trayner & Wenger-Trayner, 2015).

This research is significant because it contributes to the field of research through analysing the complex system of professional development and learning that occurred in the elearning community. Implications of this study include descriptions of new models of professional development for teachers, which take into consideration learning as a social practice in a community context. The new model of professional learning that has ensued and the insights gained in this research may be beneficial for teachers, leaders and policymakers in education in considering professional learning in integrating technology. This research also contributes theorisations of a cluster community and a nexus group as formations that support building teacher capacity in a network of schools. This research builds on theorisation of communities in relation to teacher professional learning. This research may guide those setting up future elearning communities or clusters using coaching support for teachers in educational settings.

1.8 Structure of This Thesis

This introductory chapter has set the scene for the research. Chapter two is a literature review that explores what might constitute effective approaches to professional learning. Chapter three scopes the communities of practice theoretical framework for this study, including key concepts such as brokering, technology stewarding, knowledgeability and learning in landscapes of practice. The terminology introduced is interwoven with an exploration of related studies that have influenced the shaping of this research. Chapter four explains the qualitative case-study research design and methodology applicable to this study, including the process of recruitment, interviewing of participants, demographics and trustworthiness of the study. The findings and discussion of this research are presented in chapters five to eight. Chapter nine, closes this study, presenting conclusions, discussing its implications, limitations and suggesting further research.

In the next chapter, literature on approaches that might constitute effective professional learning when considering the complex needs of teachers as professionals and as situated learners is discussed in further detail.

Chapter 2 Literature Review – Professional Learning

This literature review chapter focuses on situated and social approaches to professional learning. For decades, researchers and policymakers have been calling for new approaches to professional development (PD). The need to improve the provision of effective professional learning for teachers in technology integration continues to be a feature of current policy, standards and research. While there has been much interest in this area, there is still no consensus on what constitutes effective professional learning. This review is a synthesis of reviews, professional literature and theoretical works concerned with identifying key characteristics of what might constitute effective professional learning. This chapter begins with a discussion of the terms professional development and professional learning. It includes a purposeful selection of the most relevant theory and examples of educational practice-based research literature to contextualise this study. This review considers dynamic and emerging approaches to professional learning as entry point into this research. This case study is an example of the praxis increasingly occurring as funding begins to reflect the theoretical shift in education policy resulting in the actualisation of dynamic and collaborative models in education settings.

2.1 Defining Professional Development and Professional Learning

There has been a shift away from the use of the term “professional development” and a take-up of the term “professional learning” across jurisdictions in Australia (Doecke et al., 2008; Grimmett, 2012; Mayer & Lloyd, 2010). Mayer and Lloyd (2010) explained that while these terms are “often used interchangeably in the profession, the literature usually differentiates what is meant by each of these terms” (p. 3). Grimmett (2012) explained that the increased symbolic

substitution of the term professional development with the term professional learning in the literature over the past two decades reflects an evolution in thinking. Professional development is often used to refer to activities (such as workshops and conferences), whilst professional learning embraces more complex, ongoing processes of transformation including: study groups, learning communities, peer learning, coaching, mentoring and observation (AITSL 2014a; P. Cole, 2005; Doecke et al., 2008; Grimmer, 2012; Kose & Lim, 2011; Mayer & Lloyd, 2010; Monash Professional Learning Research Group, 2008). Despite the fact that the idea that professional development should be more than a one-off workshop is not new, the change in terminology reflects the backing of policymakers and educational leaders for seeing these forms of professional learning actualised.

A number of terms are synonymous with professional development. Professional development is a form of adult education or andragogy (Beale, 2003) and a reflective, ongoing process (Darling-Hammond & Ball, 1998; Helleve, 2010). The early work of Knowles (1984) described andragogy as an approach to the teaching of adults whereby learners already have rich knowledge and are self-directed. In contrast to this, Knowles (1984) described pedagogy as the approach to teaching children in which the teacher takes responsibility for what is learned, how it is learned and when it is learned. The notion of pedagogy is also changing to embrace constructivist approaches such as the notion of student-centred learning, as noted in the previous chapter. Pedagogy broadly means teaching and learning approaches in general, not just the teaching of children. It has been used to describe teaching approaches with adults in Wenger-Trayner et al. (2015). Although pedagogy etymologically refers to children, the term now describes enactment of a philosophy of teaching.

Terehoff (2002) acknowledges the work of Knowles and adds that it is important to involve the adult learner in the process of needs analysis, planning, implementation and evaluation of learning. Due to the background knowledge and specific learning needs of adults (Beale, 2003), professional learning becomes a performance-centred rather than a subject-oriented activity (Terehoff, 2002). Beale (2003) adds that participant involvement allows ownership of professional development processes. Kelly (2006) prefers the term “teacher learning” to describe “the process by which teachers move towards expertise” (p. 505) because the term teacher development “does not provide for a distinction between teacher knowing and teacher identity” (p. 505). Teacher education, pre-service teacher development and teacher training are closely related fields. Other terms such as in-service training and workplace learning are also used to describe professional development. However, the discussion here focuses on the more popular terms professional development and professional learning.

The exchange of the term professional learning for professional development reflects a change in thinking. P. Cole (2004) provoked discussion in “Professional Development: A Great Way to Avoid Change”. Fullan (2007) concurred and demanded we “abandon professional development and make professional learning an everyday experience for all educators” (p. 36) highlighting the need for learning in the classroom context. Fullan (2007) referred to professional development as “workshops, courses, programs and related activities that are designed presumably to provide teachers with new ideas, skills, and competencies necessary for improvement in the classroom” (p. 35). The Organisation for Economic Co-operation and Development (OECD, 2009) similarly defined professional development as “activities that develop an individual’s skills, knowledge, expertise and other characteristics as a teacher” (p. 49). P. Cole (2005) believes the term professional learning “helps to broaden thinking about teacher

development” (p. 5). P. Cole (2005) also believes that the term helps to “situate the teacher/learner rather than the development program at the centre of the action” (p. 5). The term professional learning is not burdened with the “baggage” (P. Cole, 2005, p. 5) of the contextualised workshops or activities “done to” or “provided to” teachers with which professional development is laden (P. Cole, 2005; Mayer & Lloyd, 2010; Monash Professional Learning Research Group, 2008). A later distinction has been the differentiation of the conception of professional development as doing things to teachers and professional learning as working with teachers (Loughran et al., 2011; Monash Professional Learning Research Group, 2008).

A distinction between formal and informal professional development has been recognised. Conners (1991) made a distinction between formal and informal activities within this definition of professional development; being “the sum of all activities, both formal and informal, carried out by the individual or system to promote staff growth and renewal” (p. 54). The Victorian Government, Department of Education and Training (DET, 2005b) referred to “traditional professional development as one-off seminars, conferences and workshops” (p. 4) and professional learning as “ongoing, school-based and directly relevant to the daily work of teachers” (p. 4). DET has adopted this change in terminology from professional development to professional learning, as has the national professional standards body, the Australian Institute for Teaching and School Leadership (AITSL), to embrace the broader conceptualisation of teacher learning. This study is interested in professional development and learning, but does not resolve the issue of interchangeability and inconsistency in the terms’ usage.

In AITSL’s commissioned literature review on professional learning, Mayer and Lloyd (2010) adopt the definition of professional development of Day and Sachs (2004) in their review

of literature on professional learning, as one which “captured both development and learning” (Mayer & Lloyd, 2010, p. 3):

All natural learning experiences and those conscious and planned activities which are intended to be of direct or indirect benefit to the individual, group or school and which contribute ... to the quality of education in the classroom. It is the process by which, alone and with others, teachers review, renew and extend their commitment as change agents to the moral purposes of teaching and by which they acquire and develop critically the knowledge, skills and emotional intelligence essential to good professional thinking, planning and practice with children, young people and colleagues through each phase of their teaching lives. (Day & Sachs, 2004, p. 34)

In this definition, Day and Sachs (2004) have encapsulated the process of professional development, embraced “natural” and “planned” ways of learning and acknowledged that the phase of a teacher’s teaching career is an important consideration. This review supports this definition of professional learning to some degree, but places less importance on teacher career stage in relation to pedagogy-focused professional learning in integrating technology.

In this thesis, the terms professional development and professional learning are used interchangeably. The appropriate term is used contextually to reflect the shift in thinking about professional development and professional learning which has occurred in literature and practice over the last ten years. One caveat is that the term professional development was preferred during the project and consequently this term may be used contextually to refer to workshops and broader teacher learning in general. The graph produced with the Google Books Ngram viewer supports an increase in the term professional learning and decrease in professional development

since 2005; however, the term professional development still has a much higher frequency of use overall (see Figure 4). A limitation of the Ngram viewer is that it only returns results up to 2008 at this stage.

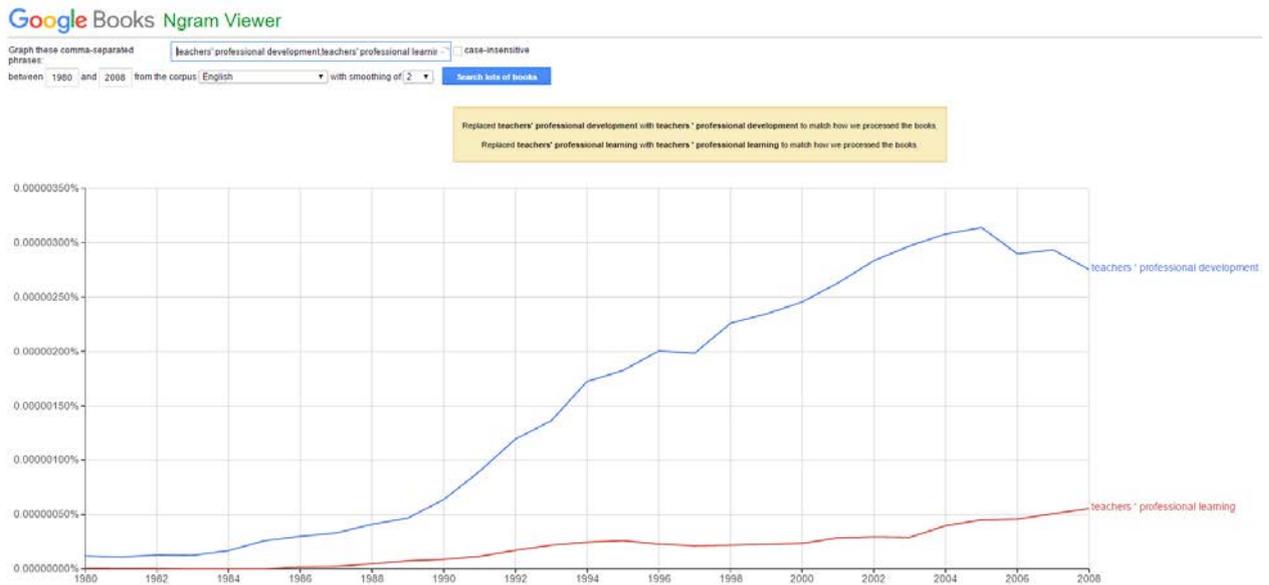


Figure 4 Ngram Graph Representing the Rise of the Term Teachers' Professional Learning and Decline in use of Teachers' Professional Development (Google Ngram Viewer, <https://books.google.com/ngrams>)

This section has elaborated on the evolution of definitions and preferred language around teacher professional learning. The next section considers the complexity of teachers as learners. It raises the importance of considering teachers as individual learners, including them in the development process, and the importance of transformation of beliefs and identity as part of the learning process.

2.2 The Complexity of Teacher Learners

In this section, understanding teachers' individual needs and transformative learning processes is considered in connection with professional learning.

Ideally, teachers' complex learning needs, as individuals, are considerations in the design of professional learning programs. A number of theorists have recommended that professional learning should be based on teachers' individual needs (P. Cole, 2005; OECD, 2009; Orlando, 2012), ideally those identified by teachers themselves (Conners, 1991). Teachers' needs can also be better met if they are involved in the development of their learning experiences (AITSL, 2012; Fullan, 1993; Hawley & Valli, 1999). Professional learning must pay attention to the principles of adult learning (Conners, 1991; Jensen et al., 2016; Knowles, 1984). Along the same lines, Darling-Hammond and Ball (1998) has argued that professional development needs to take into consideration teachers' prior beliefs and experience.

Bell and Gilbert (1994) undertook a three-year study working with science teachers in New Zealand who “were developing their teaching to take into account their students' thinking and constructivist views of learning” (p. 483). The main finding of this study was that “teacher development involved professional, personal and social development” (Bell & Gilbert, 1994, p. 483). Teacher development must involve more than an agenda to impose change externally—it involves cognitive changes (Orlando, 2012) and/or metacognitive process (Bell & Gilbert, 1994, p. 483). Therefore, reflection by the teacher is an important part of this process (AITSL, 2012; P. Cole, 2005; Helleve, 2010). The individual is important in achieving change in a system because “organisations do not change—individuals do” (Horde, 1997, p. 8). Professional learning

considered in this way is more likely to facilitate a change in practice for teachers when they identify their needs and develop knowledge through reflection.

The concepts of “transformation theory” (Mezirow, 1996) and “transformative learning” (Mezirow, 1997) have contributed greatly to the understanding of the processes involved in a change of beliefs and identity leading to lasting change in practice. Mezirow is credited with coining and developing the adult learning-focused “transformative learning theory” (E. W. Taylor, 2008). Learning then, according to Mezirow (1996), is to be “understood as the process of using a prior interpretation to construe a new or revised interpretation of the meaning of one’s experience in order to guide future action” (p. 162). Transformation theory is then a process that “involves transforming frames of reference through critical reflection of assumptions, validating contested beliefs through discourse, taking action on one’s reflective insight, and critically assessing it” (Mezirow, 1997, p. 11). One significant aspect of Mezirow’s (1996) theory valuable to this study is the idea of communicative competence, which “refers to the ability of the learner to negotiate his or her own purposes, values and meanings rather than to simply accept those of others” (p. 164). With this in mind, the goal of adult education is “to help the individual become a more autonomous thinker by learning to negotiate his or her own values, meanings, and purposes rather than to uncritically act on those of others” (Mezirow, 1997, p. 11).

Professional learning needs to be perceived as a fundamental part of the profession of teaching—not an “add on” (Doecke et al., 2008, p. xiii; Jensen et al., 2016, p. 3). Transformative learning is the “essence of adult education”, not an “add on” (Mezirow, 1997, p. 11). This is because “teacher professional learning at its best is not merely about the acquisition of knowledge and skills, but the formation and mediation of teacher professional identity” (Mockler, 2013, p. 42). Orlando (2012) found that “that a meaningful approach to professional development would be

one that acknowledges the centrality of contextual and individualised factors important to teachers in their ICT practices” (p. 47). It is through change in individuals’ beliefs and identity that change in schools and systems is achieved (Senge et al., 2000; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). The broadening of the ontology of learning to embrace a synthesis of paradigms and concepts congruous with transformative learning views is a way to acknowledge the complexity of teachers as learners.

This section has introduced the notion of transformative learning and acknowledged the importance of involving teachers in the process of their own professional learning. This broadens the view of professional learning beyond a packaged set of skills to take into account the role of teachers in constructing their own meaning. Consideration of teachers as individual learners is relevant to this case study in that the coaching program was a negotiated approach to professional learning. The next sections present a further consideration of transformative approaches and consideration of the importance of thinking more broadly of professional learning as a continuous or ongoing pursuit.

2.3 Embracing the Concept of Ongoing Learning

This section presents the argument that no single approach to professional learning will meet the ongoing needs of teachers and that a combination of transformative approaches is required.

There is agreement that professional learning is a career-long pursuit and that teachers should have continuous opportunities to develop their practice (Connors, 1991; Doecke et al., 2008; Hawley & Valli, 1999; Megginson & Whitaker, 2003). Continuing professional

development (CPD) was defined in the *Making Connections: Models of Teacher Professional Development for the Integration of Information and Communications Technology (ICT)* report as “any activity that develops existing teachers’ professional skills, knowledge and experience” (Downes et al., 2001, p. 9). This Australian report found that there was insufficient attention to “sustained work-based teacher development” (p. 73). If professional learning is considered an ongoing process, then it becomes important that the learning is owned by the teacher. Continuing professional development is a model that embraces the facets of what might constitute effective and transformative professional learning and is based on the premise that the learner is “in control” of a “holistic process” (Megginson & Whitaker, 2003, p. 5). Conners (1991) argued that “the stage in their career should be taken into account when planning systematic programs for their learning” (p. 54). However, ongoing professional development is needed for teachers at all career stages in keeping up with “the changing demands of the technological environment” (Goold, Coldwell, & Craig, 2010, p. 704). Professional learning is important during all stages of a teacher’s career and it is important that individual needs be taken into account if change is to take place.

Transformative models of professional learning comprise a combination of approaches. Kennedy (2005), in a comprehensive review of continuing professional development models, positioned approaches on a continuum from transmissive to transformative, whereby the model embraces increasing emphasis on a “capacity for professional autonomy” (Kennedy, 2005, p. 248). Kennedy’s (2005) article remains the most read from the *Professional Development in Education* journal (formerly the *Journal of In-Service Education*) and was reprinted in 2014 in recognition of this. Kennedy (2014) has also taken the opportunity to reflect on this achievement and to revise the model. The transmissive approaches are those aimed at supporting the

implementation of policy agendas. The transformative end of the scale focuses on teachers “contributing to and shaping education policy and practice and would align itself more naturally with the action research and transformative models” (Kennedy, 2005, p. 248). For Kennedy (2005), the transformative model

involves the combination of a number of processes and conditions – aspects of which are drawn from other models ... the transformative model is not a clearly definable model in itself; rather it recognizes the range of different conditions required for transformative practice. (p. 246)

Kennedy has revised the spectrum (see Figure 5) to remove transformative model in light of the fact that it is a combination of approaches, not a specific model. The formerly named “transition” category is renamed “malleable”. The “award-bearing model” has moved from the “transmissive” category to the “malleable” category in recognition of the changes to learning in these modes to increase teacher agency. The aspect of “teacher agency” has been added to the description of “increasing professional autonomy”.

| Purpose of model | Examples of models of CPD which may fit within this category |
|------------------|---|
| Transmissive | Training models Deficit models Cascade models |
| Malleable | Award-bearing models Standards-based models Coaching/mentoring models Community of practice models |
| Transformative | Collaborative professional inquiry models |

Increasing capacity for professional autonomy and teacher agency



Figure 5. Spectrum of CPD Models Adapted (Kennedy, 2014, p. 693). Reproduced With Permission.

A study into continuous professional development (CPD) was conducted by Sangster, Stone and Anderson (2013). A new model of CPD implemented by a local authority in Scotland gave teachers the opportunity to be involved with the development of their professional learning. The key elements of the model were group sessions, focused input in participants' schools on topics of their choosing and individual support. Analysis of the resulting interview data revealed that participants understood the "transformative nature of critical pedagogy approaches" (Sangster et al., 2013, p. 615). Participants also found that the learning that took place during the CPD model made a future impact on their teaching practices. The CPD model was "transformative in that it shaped and centrally informed their subsequent pedagogical practices" (Sangster et al., 2013, p. 615). The model was transformative in the sense described by Kennedy (2005) and Mezirow (1996). The present study explores teacher professional learning that includes a combination of approaches, including group sessions followed by individual support.

In another study of CPD, Ridley (2011) explored an initiative across two clusters of primary schools in England to investigate the level of "choice teachers have over the content and direction of their CPD" (p. 4). Data was collected from headteachers and teachers by way of a survey and then semi-structured interviews. The CPD framework for the study delineated three categories: training, education and support (Ridley, 2011, p. 3). The program consisted of five mandatory training days aligned with a one-year performance management cycle. Based on the findings of the study, Ridley argued "against a deficit model of CPD and in favour of a benefits and growth model with its tailored approach to CPD and its emphasis on the development needs of individual schools" (p. 4). The program was aligned with the school development plan and performance management but, unfortunately, there was little opportunity for "individual, school-based approach to CPD" (p. 4). A relevant finding of this study was that "Teachers expressed a

preference for tailored in-school provision delivered by colleagues in which the school operated as a community of practice and professional learning community, rather than a perceived one-size fits all, centrally imposed deficit model” (p. 12). One problem with this program was that entitlement for a CPD coordinator did not eventuate and headteachers assumed this role. The headteachers in these small schools were generally teaching classes four days per week as well as their headteacher responsibilities. This had an impact on the support aspect of CPD because there were no staff with dedicated time for the program. Again, while called a CPD program, it was limited to a short-term program and did not allow for longer courses.

While it makes sense to consider professional learning as a career-long pursuit, a limitation of research—one also faced by this study—is that it is often not feasible to conduct research on professional learning that continues longer than a few years. In the studies by Sangster et al. (2013) and Ridley (2011) the models investigated were described as CPD. Importantly, CPD is not effective in itself; it is a generic term to describe a combination of approaches over time. However, while the professional learning program researched went for a two-year period and one-year period respectively, the data was collected at the end of the program. Typically, both research projects and professional development programs are short term in nature. Political cycles that govern the program agendas affect the duration of projects. The current study illuminates the impact of a three-year time-limited project via its collection of interviews two years after the government-funded program ended.

This section has presented continuous professional development as a notion that recognised the many forms of ongoing learning in the teaching profession. The next section discusses the ideas of contextual and authentic approaches for teacher learning.

2.4 Contextual and Authentic Approaches

Presented in this section is a discussion of approaches to contextual and authentic professional learning. The focus on contextual and authentic approaches recognises the need for professional learning approaches to take into account the situated nature of learning. Learning is more effective for a teacher if it takes place in or is closely related to their work context and practice.

It has been acknowledged by many theorists that professional learning is most effective when it includes many opportunities for learning in context (P. Cole, 2005; Darling-Hammond, 1998; Doecke et al., 2008; Fullan, 2006; Hawley & Valli, 1999; Kwakman, 2003; Orlando, 2012). P. Cole (2005) argued that the perception and practice of professional development as an outside-of-school program needs to change because internal professional learning is more authentic than external sessions (p. 4). P. Cole (2005) recommended a shift in professional learning practice to be work-based and for staff to learn from each other, with integration of work and learning becoming a routine practice, including the group pursuit of learning (p. 3). For Wenger (1998), “extractive training ignores an organisation’s most valuable learning resource: practice itself” (p. 249). However, Wenger did not discredit professional learning workshops altogether because “a separate institutionalised setting can create just the discontinuity that is needed for exploring new relations and new possibilities” (p. 250). People coming together from different organisations can also be beneficial because:

Coming together from a variety of locations for a training session can be an occasion for creating a community among people who might not have otherwise had the opportunity to meet. This expanded community, the relationships that are created, and the exchange of

experience may well end up being more significant than the content of any instructional program. (Wenger, 1998, p. 250)

Conners (1991) and P. Cole (2005) also supported in-house strategies that promote cultural change and exchange within a school. Multiple opportunities for professional learning in context support the individual learning of teachers and provide benefits to teachers working together. In the next chapter, the notion of situated learning is considered further.

A way to develop authentic professional learning is to involve teachers in real-world experiences similar to those they facilitate for their students, including participating in learning communities. Al-Mahmood and McLoughlin (2004) explored how online educators can change conceptions of teaching through reflective practice of their experience as online students. During their time as an online student, one of the authors reflected on their online teaching practice and realised that it “confirmed, challenged and transformed some of her assumptions about online teaching and learning” (p. 37). The study highlighted that reflective practice on their experience as online students gave the authors insights to improve their pedagogical practice as online university teachers (Al-Mahmood & McLoughlin, 2004). Cuthell (2010) also advocated for experiential learning by teachers as a method for improving pedagogy in a study on a curriculum development program. During the program, teachers were able to develop an online project-based curriculum through their experience with virtual training and four days of face-to-face training. Teachers were later supported in the implementation of this curriculum through mentoring. Cuthell (2010) explained, “the elements that made such a transformation possible—[were] participating in an active learning process, embedding ICT in the whole of the learning cycle, experiencing collaborative learning and being a member of a supportive and sustaining

community of practice” (p. 164). Cuthell (2010) and Al-Mahmood and McLoughlin (2004) argued that experiential learning improves teacher reflection and praxis.

Explored in the next section are the coaching approaches relevant to professional learning in the context of this case study.

2.5 Peer Coaching Approaches

Coaching is seen as an effective form of professional learning for bringing about change in teacher classroom practice (AITSL, 2012; Beglau et al., 2011; Burley & Pomphrey, 2011; P. Cole, 2005). There are many types of coaching documented in the literature, such as instructional coaching, cognitive coaching and peer coaching (Beglau et al., 2011). There are also other closely related approaches, such as mentoring (Burley & Pomphrey, 2011; Fletcher & Mullen, 2012), but this study does not focus on these. Peer coaching was a large part of the approach planned by the elearning community involved in this study. The hiring of 14 staff for this purpose was a significant investment. Therefore, this review focuses on studies of peer coaching as a form of professional learning for teachers in schools. The four Australian studies included here had different units of analysis and only two focused on technology integration. The first example drew on data collected Australia-wide from teachers who were involved in professional development as provided by schools clustered under the Australian Government Quality Teacher Programme. The second study drew insight from coaches from a three-year elearning project involving seven schools. The third study drew from teachers from different schools who had come together for training in ICT peer coaching. The fourth example was a unique one-to-one coaching pedagogy development study (not focused on technology integration). These examples serve to show the variation in studies and their findings in relation to coaching.

Research into professional learning in cluster school arrangements across Australia has been documented by Ingvarson, Meiers and Beavis (2005). This large-scale synthesis consolidated data from four studies conducted by the Australian Council for Educational Research and included surveys of 3,250 Australian teachers who had participated in 80 professional development activities as part of the programs funded by the Australian Government Quality Teacher Program during 2002-2003. They reported that the most effective programs included follow-up:

The level of follow up was found to increase significantly the extent which teachers reported a sense of increased knowledge, perhaps reflecting the critical role that “at the elbow” coaching and support in classrooms plays in learning new skills and putting them into practice. (Ingvarson, Meiers, et al., 2005, p. 17)

This was supported by an early theorisation of effective professional development by Hawley and Valli (1999), who specified that “follow-up” is important in “develop[ing] new pedagogical skills” (p. 141) and that time is a necessary part of that investment. The finding that coaching is a critical element in cluster professional learning programs provides further justification for extending the research through this case study.

A study was conducted to explore the role of coaches in an elearning project between seven secondary schools in Australia. In this study, Skues and Cunningham (2013) explored the personal experiences of elearning coaches through interviews to gain insight into the role, as this was a new development for the schools in their study. The analysis of the semi-structured interviews identified the following themes: “role confusion, changes in the role over time, the importance of establishing relationships, barriers to the uptake of information and communication

technology (ICT) and ICT usage” (Skues & Cunningham, 2013, p. 179). It was reported that the role of the elearning coach in this project was specified by each school according to their needs, although “schools were explicitly informed by the program coordinator that coaches were not additional technical support” (Skues & Cunningham, 2013, p. 181). The study recommended that “a full-time position for an on-site e-learning coach receiving the total support of school leaders is needed to provide relevant professional development and ongoing support to classroom teachers” (Skues & Cunningham, 2013, p. 179). One limitation of this study is that it only considered the perspectives of the coaches, not teachers. Another limitation is that it did not explore whether there was collaboration between the coaches involved in the elearning project. The present study explores the role of community in the experiences of the teachers working with coaches. This case study also extends knowledge about the kinds of support needed for elearning coaches to maximise their benefit to teachers in integrating ICT into the curriculum.

Peer coaching is an effective form of professional learning, particularly where collaborative cultures are developed. Ellul’s (2010) study “identified the need for greater cohesion between the ICT peer coaching programs and the culture, strategic planning and reform agenda in place at the school in order to align the programme to the school’s strategic goals” (p. iii). A finding of the study was that “a school-based ICT peer coaching programme can be an approach where teachers explore and investigate together in a culture of collegiality, ongoing professional learning and continuous improvement” (p. 137). When peer learning is included as a systematic ongoing process of teacher development, then the learning extends beyond them to the community of learners (Helleve, 2010; OECD, 2009). The present study incorporates the communities of practice framework to develop understanding of the ways that coaches develop individual and community learning.

The term “co-teaching” describes peers working together in a classroom as a form of professional learning. Grimmett (2012) developed a model of professional learning that incorporates co-teaching or peer coaching, for which she coined the term “WITHIN Practice PD”; a form of professional learning *with* teachers *in* their practice. The in-depth study used a cultural–historical analysis and found that a set of theoretical lectures did little to enhance teacher practice. It concluded that collaborative teaching and development of lessons with the peer coach were more effective. This finding warrants further research to explore the co-teaching experience in more than one case. While cultural–historical theory was appropriate for the focus on an individual teacher in Grimmett’s study, in considering the broader framework of schools working together I have chosen communities of practice theory as more suitable for this level of analysis. This study extends understanding of the co-teaching approach in a context where coaches were available to work with teachers in the classroom.

Coaching provides professional learning tailored to teachers’ needs. Kennedy (2005) explains that the defining characteristic of the coaching model in the context of continuing professional development (CPD) practices “is the importance of the one-to-one relationship, generally between two teachers” (p. 242). Ideally, professional learning will meet the needs of teachers, “just-in-time”, not “just-in-case” and thereby “transform teachers into active knowledge builders” (Hew & Hara, 2007, p. 574). Having peer coaches available in the elearning project meant there was potential for teachers to have their learning tailored to their needs over a longer term. The use of coaching is similar to the apprenticeship or mentoring models, with the point of difference being that in learning from peers, both people can benefit and learn from the interactions.

In this section, coaching approaches have been discussed. The next section builds on the social approach of coaching to build teacher capacity by introducing the collegial, collaborative and community approaches to teacher learning.

2.6 Collegial, Collaborative and Community Approaches

Teacher collegiality has been increasingly recognised as a strategy for effective professional learning (Doecke et al., 2008; Ellul, 2010; Jensen et al., 2016; Mayer & Lloyd, 2010). Mayer and Lloyd (2010) indicate in their literature review an increased acknowledgement among researchers of the importance of social interaction in teacher learning. P. Cole (2012) argued that professional learning is more effective through “teachers learning from each other by sharing experiences and expertise” than “attendance at an externally-provided conference or workshop” (p. 8). In their guidelines for professional learning, Doecke et al. (2008) recommend that teacher professional learning should be recognised as “strongly collegial and collaborative in nature” (p. xv). Ellul’s (2010) study highlighted the importance of “collaboration and collegiality”, which she argues are central to the professional learning strategy of “ICT peer coaching” (p. 19). Her conclusion that “a school-based ICT peer coaching programme can be an approach where teachers explore and investigate together in a culture of collegiality, ongoing professional learning and continuous improvement” (p. 137) emphasises collegiality as the important aspect of professional learning. Using a situated perspective, Borko (2004) compared three kinds of structures for professional development in the literature: one site; multiple facilitators and multiple sites; and multiple programs at multiple sites. Based on a review of programs across these three kinds of program structures, Borko (2004) emphasised the influence of collegial interactions in changing the practice of networked learning communities. Teacher collegiality warrants further consideration in research.

Collaborative community approaches support successful professional learning. Recent international and Australian policy documents share the premise that teachers' learning is a collaborative process that is supported by learning communities (AITSL, 2012; Mayer & Lloyd, 2010; MCEETYA, 2009; OECD, 2009). The Australian Charter for the Professional Learning of Teachers and School Leaders includes collaborative approaches in its exposition of effective professional learning (AITSL, 2012, p. 5). AITSL (2012) recommends we look for professional learning that “develops professional learning communities within and between schools” (p. 5). Increasingly, schools are being developed as learning organisations as a way of formalising process around teachers sharing knowledge and expertise (OECD, 2009; Senge et al., 2000). The OECD (2009) endorses teacher learning communities as part of successful programs of professional development. Mayer and Lloyd (2010) also write about the increased focus on the social aspect of learning and acknowledge of the role of learning communities.

Learning communities, whether facilitated or self-generated, have in common the assumption of a shared interest between their members and the purpose of knowledge sharing. In a definition by Berntsen, Munkvold and Østerlie (2004), the role of communities includes developing a shared understanding from disparate knowledge. Importantly, members of communities continually negotiate these shared understandings:

Communities rely on the informal depiction that each member generates of it: who is part of the community, which are the different modes of participation that are accepted, who knows what, what cultural tools are used to mediate communication and interaction, and so forth. The depictions of the community are iterative and evolve continuously as community members share experiences, take action and interact with each other, as well

as the outside world which is reasoned about. A shared understanding is negotiated and emerges from scattered pieces of knowledge and knowing. (Berntsen et al., 2004, p. 10)

Unsurprisingly, the discourse used in this definition resonates with the communities of practice literature Berntsen, Munkvold and Østerlie (2004) use to explore the concept of knowledge building through collaboration from the angles of community and practice respectively. The possibility of knowledge building or the creation of new knowledge is not explicit in this definition.

A definition of learning communities that highlights the importance of knowledge building is given by Kilpatrick, Barrett and Jones (2003):

Learning communities are made up of people who share a common purpose. They collaborate to draw on individual strengths, respect a variety of perspectives, and actively promote learning opportunities. The outcomes are the creation of a vibrant, synergistic environment, enhanced potential for all members, and the possibility that new knowledge will be created. (p. 11)

New knowledge creation is an important benefit of community approaches. Knowledge creation requires more transformative learning and is more sustainable. This knowledge may be new in the sense of the meaning attributed to the application of it to practice within that community.

To achieve collaborative and community cultures in schools conducive to professional learning, leadership support is needed (P. Cole, 2005; Wong, Li, Choi, & Lee, 2008). This support cannot be tokenistic; P. Cole (2005) argued “teaching and learning leadership teams must initiate a range of actions to build a strong collaborative culture within their schools” (p. 13). With regard

to integration of technology into pedagogical innovation, Wong et al. (2008) added to the requirements of leadership support and collaboration the importance of supporting a climate of experimentation. Ellul's (2010) study acknowledged that school leadership is also enacted by teachers in mentoring, coaching and peer teaching roles. Support of school leadership "to develop a clear vision of the purpose of an ICT peer coaching programme, link the programme to the school's strategic goals and to provide adequate resourcing" was found to be integral to the success of ICT peer coaching programs (Ellul, 2010, p. 110). Leveraging collaborative processes in schools requires leadership support.

It is also important for teachers to collaborate with other teachers, including those in other schools. The Victorian Government funded the Schools for Innovation and Excellence (SIE) cluster initiative to improve learning through collaboration between schools. The evaluation of this initiative by Ingvarson, Khoo, Beavis and Meiers (2005) reported that "The survey responses about the nature of cluster activities and the use of SIE finding indicate clear recognition that improving student learning outcomes is directly linked to the provision of professional learning for teachers" (p. 85). Analysis of survey data supported the contention that the cluster initiative improved student-learning outcomes. The evaluation also found that the clustering of schools made it possible "to provide professional learning opportunities directly relevant to local needs and interests" (Ingvarson, Khoo, et al., 2005, p. 85). Unfortunately, large-scale mapping projects similar to the SIE evaluation, such as those conducted by Doecke, Parr and North (2008) and McRae, Ainsworth, Groves, Rowland and Zbar (2001), "report limited access to these types of professional learning" (Grimmett, 2012, p. 54). The clustering of schools is an effective way to foster collaboration between teachers at different schools and offer tailored professional learning programs; however, access for teachers to these kinds of approaches have been limited.

Professional learning communities should be perceived as an approach best combined with other collaborative models (Horde, 1997; Servage, 2008). In the Alberta Initiative for School Improvement (AIS) program, the professional learning community model was combined with “curriculum study, collaborative development of lessons and assessment tools, analysis of student achievement data, and the implementation and assessment of new teaching strategies” (Servage, 2008, p. 69). The findings in the review (L. Taylor, Servage, McRae, & Parsons, 2006) of this program “suggested that these tasks have a positive impact on students and teachers alike” (Servage, 2008, p. 69). However, by Mezirow’s definition, the activities were instrumental and missed the important communicative aspects of transformative learning, thus “keeping teachers locked into a hypothetical-deductive mindset, and focussed on relatively short-term goals” (Servage, 2008, p. 69). To encourage transformative learning, more time is needed for open-ended dialogue in teacher collaboration and critical reflection (Senge et al., 2000; Servage, 2008). Professional learning communities, even where transformation in the full sense described by Mezirow does not occur, still achieve worthwhile benefits.

Combined approaches to professional learning suit systemic projects. A study by K. Cole, Simkins and Penuel (2002) supported multiple programs for ICT integration professional learning in a multimedia project that spanned 50 schools in 11 districts. The five approaches included: (a) bringing together learning technology coordinators from multiple schools (a mentoring system); (b) grants for teachers to work on specific planned projects; (c) partnering teachers experienced with multimedia projects with novices; (d) student interviews as a method of evaluation; and (e) annual exhibitions of student multimedia projects (p. 431). It was found that the synergistic effect of these combined approaches led to success of the program in “disseminating effective strategies for technology use, and in finding a level of systemic support for teaching with technology” (K.

Cole et al., 2002, p. 431) . Multiple strategies available across districts allow for different avenues for participation of teachers and support technology integration in classrooms.

There have been concerns about naming groups as professional learning communities (PLCs) that may not be involved in a practice of deep learning or collective knowledge building (Fullan, 2006). The three main problems with the way professional learning communities are viewed or implemented are superficiality, PLC as a program innovation and a focus on individual schools (Fullan, 2006, p. 7). These problems can be mitigated by considering the bigger picture and focusing on “lateral capacity building” (Fullan, 2006, p. 7; Fullan, Hill, & Crévola, 2006, p. 95), which is achieved through schools learning from other schools and groups of schools learning from other groups of schools (Fullan, 1993; Horde, 1997). In this way, the professional learning community facilitates “helping to develop individual and collective knowledge and competencies; resources; and motivation” (Fullan, 2006, p. 9). Fullan (2006) wrote that “The key in large-scale reform is whether the strategy can get a large number of leaders (change agents), within and across the three levels, to own the enterprise jointly” (p. 12). Leaders working as change agents across three levels—school and community; district; and state—affect change by engaging members of school communities in contributing jointly to broader enterprises (Fullan, 2006). The notions of change agents and owning enterprises jointly resonate with the work of brokers and the concept of “joint enterprise” respectively, described by Wenger (1998) and will be revisited in chapter three.

Another way teachers can benefit from collaboration beyond their schools is by participating in cross-sectorial partnerships (Doecke et al., 2008, p. xv). The Australian School Innovation in Science, Technology and Mathematics (ASISTM) initiative funded school cluster or community organisation projects “comprising schools, industry partners, and experts” (Tytler

et al., 2008, pp. 32–33). An innovation framework was developed by Tytler, Symington, Smith and Rodrigues (2008) based on the 16 best practice exemplars of the ASISTM projects and included six major dimensions:

1. The ideas being explored/promoted
2. The actors (individuals, organisations, resources, environment) recruited in support of the project
3. Practices (scientific, technological, pedagogical) to support the new alignment of ideas/actors
4. Intended and actual outcomes
5. Sustainability of the innovation in some form; and
6. Transferability of the ideas and practices beyond the local site (Tytler et al., 2008, pp. 9–10)

The research found that “there was considerable evidence of professional growth and in some cases professional renewal in their stories. The ASISTM initiative offers a significant model of teacher professional learning” (Tytler et al., 2008, p. 38). The ASISTM funding made possible student-centred, authentic learning, linking school clusters with institutions and organisations and leading to a new form of situated learning for teachers.

Professional learning as a collaborative community process can be leveraged not only within one school or as a top-down approach (vertical influence) but also as a bottom-up or bottom-across approach (horizontal influence) for increased impact. Fullan (1994) proposed a blend of the two approaches, claiming neither on its own is effective. The “bottom-across” (Coolahan, 2002, p. 26) approach is a variation of the “top-down” and “bottom-up”, whereby the

teachers are involved in “inter-school networks or clusters, wherein staff from a number of schools work together on new curricula or methodologies” (Coolahan, 2002, p. 26). This study will contribute to this contention in a similar way to Sangster’s in describing the impact of bottom-across (Coolahan, 2002) or horizontal approaches.

Collaborative cultures in schools can be supported by “distributed leadership” (Elmore, 2000; Spillane, Halverson, & Diamond, 2001), also referred to as “shared leadership” (Duignan, 2006) or “supportive leadership” (Horde, 1997). Creating collaborative cultures relies on school leadership to support these changes in empowering individuals in the process (P. Cole, 2005; Horde, 1997; Senge et al., 2000). In the model of distributed leadership (Figure 6), empowering individuals, creating communities and encouraging flexible work practices are seen to be “conducive to school transformation” (White & Ahles, 2007, p. 7). Empowering teachers to be innovative through taking risks in their classrooms is an important aspect of distributed leadership in schools. Flattening structures and working with empowerment is conducive to transformative learning in school environments. A focus on creating communities encourages collaboration by teachers so they may learn from one another. Teachers working together expands individuals’ “zones of proximal development” (Vygotsky, 1978). Collegial influence fosters learning that matters (Senge et al., 2000). Creating communities within and beyond a school is “essential for supporting innovation, school improvement and building capacity” (Carter et al., 2006, p. 13). The distributed leadership model supports “a journey of transformation and sustainable improvement in teaching and learning” (White & Ahles, 2007, p. 1). Collaborative cultures and distributed leadership practices promotes new knowledge creation and are keys to innovation and transformation.

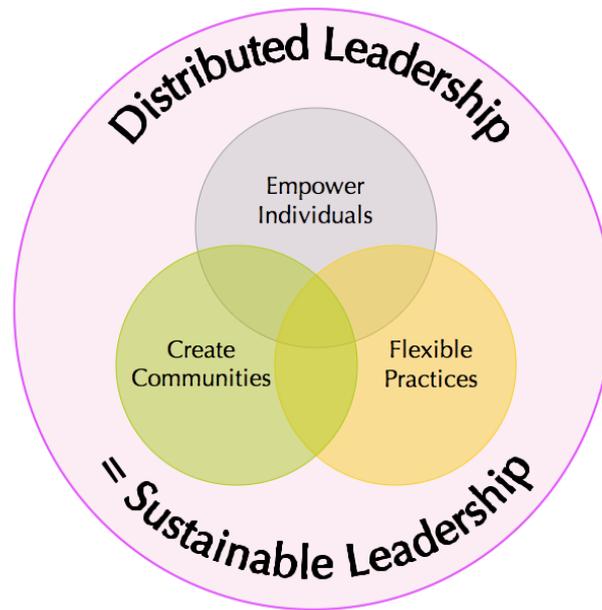


Figure 6. Distributed Leadership for Sustainable Change Model (White & Ahles, 2007, p. 3).

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Communities of practice as an element of professional learning for teachers is an area worthy of further research. In the commissioned report into teacher knowledge and student performance, Darling-Hammond and Ball (1998) concluded that to cultivate professional development that makes a difference, “substantial professional discourse and engagement in communities of practice” is needed (p. 17). As a key factor in developing collegiate and collaborative cultures, Sergiovanni (2000) claimed that “developing a community of practice may be the single most important way to improve a school” (p. 139). Further consideration of the concept of communities of practice as a both a research framework and approach to professional learning is given in chapter three.

2.7 Conclusion

Teacher professional learning involves complex social learning process that require a number of approaches beyond the workshop model. Contextual, coaching and community approaches address the problems associated with one-off activities offered to teachers. The problem of the workshop approach without follow-up is that the importance of teachers' involvement in their own learning processes is overlooked. Further research is needed into dynamic combinations of teacher professional learning that make transformation possible. A combination of approaches is needed to achieve transformation or changes in practice. The research also suggests consideration of communities of practice to support professional learning for teachers. The case in this study has been selected to explore emerging teacher professional learning strategies in a network of schools. In the next chapter, consideration of the criticisms of communities of practice in its theorisation and application, as well as examples of studies, serve to scope this study further.

Chapter 3 Theoretical Review – Communities of Practice

This chapter maps the evolution of the social learning theory of “communities of practice” (Lave & Wenger, 1991; Wenger, 1990, 1998; Wenger et al., 2002; Wenger-Trayner & Wenger-Trayner, 2015) and in doing so constructs the epistemological framework for this study. This review explains the concepts associated with communities of practice theory through three conceptual phases. The first phase begins with the concept of “legitimate peripheral participation”, which describes an individual’s entry into in a “community of practice” (Lave & Wenger, 1991). The second phase is a detailed development of the theorisation of communities of practice (Wenger, 1998). Also included in the second phase is “designing for learning” (Wenger, 1998) and the operationalisation of the theory in “cultivating communities of practice” (Wenger et al., 2002). The third phase describes the process an individual moves through over time across “landscapes of practice” (Wenger, 2013; Wenger-Trayner & Wenger-Trayner, 2015). This review draws on studies to contextualise this research theoretically, as well as discussing the methodology and findings using this framework. This chapter also discusses criticisms of the framework and the consequent implications for this study.

3.1 Phase One: Legitimate Peripheral Participation

In this section, phase one of the framework, the origins of the concepts, “legitimate peripheral participation” and “communities of practice” are explained. Consideration of the critiques in relation to the positioning of technology and power relations in the context of the communities of practice framework serves to position this study.

The term “community of practice” was first coined in the collaborative work of Lave and Wenger (1991; Wenger, 1998). In *Situated Learning: Legitimate Peripheral Participation*, learning is reconceptualised as a social practice occurring as a process of participation in a community of practice. The concern that the ideas of “apprenticeship” and “situated learning” were in danger of being reduced to simplistic notions of a process by which individuals learn a skillset resulted in their being reconceptualised as “legitimate peripheral participation”, to encapsulate their deeper meanings. Legitimate peripheral participation, then, is the process by which newcomers move towards full participation in a community of practice. Participation begins on the periphery, as an individual moves towards full membership through their participation in the practices of that community.

The concept of legitimate peripheral participation describes how people come to know and develop their practice in organisations. Lave and Wenger’s (1991) theory offers an alternative to the idea of “learning by replicating the performance of others or by acquiring knowledge transmitted in instruction” (p. 100). They suggested, rather, that learning ensues through “centripetal participation in the learning curriculum of the ambient community” (p. 100). Another important part of the notion of legitimate peripheral participation and membership in a community of practice is that it is a process of continual reproduction for the individual and its members (whether newcomers or old-timers), due to learning being a process of transformation. The initial conception of a community of practice “is left largely as an intuitive notion” (p. 42) which, they noted, served their purpose in developing the conception of legitimate peripheral participation, although they indicated that it “requires a more rigorous treatment” (p. 42). The first phase of the development of the theory of communities of practice through the concept of legitimate peripheral participation left an opening for further development of the theory.

One criticism of communities of practice theory, in its 1991 conception, is that it misses an important aspect in the role that objects or technology can play in knowledge creation. Berntsen, Munkvold and Østerlie (2004) supported the use of communities of practice as a framework for investigating knowing in collaborative work, but also recommended consideration of the role of technology in collaborative efforts. However, Berntsen et al. (2004) only drew on the 1991 conception of communities of practice in their criticism that it is missing acknowledgement of the role of artifacts, technologies or objects in having agency. They suggested that Latour's (2005) actor-network-theory could be drawn on to fill this gap in future research. This study finds that Wenger's 1990 thesis and 1998 text expounded an ontological positioning of technology in communities of practice theory and explained its differences from actor-network-theory.

Communities of practice theory's consideration of technology differs ontologically with that of actor-network-theory. The interplay between understanding and technology is highlighted by Wenger (1990) when he stated that his "discourse is about technology, about objectifying, about encoding, about sociocultural process that includes into one integral, dialectical phenomenon the transformation of understanding into artifacts and the transformation of artifacts into understanding" (p. 2). Wenger (1998) explicitly explained the difference between his own and Latour's perspectives on technology:

This distinction differentiates my approach from functional cybernetic, or system-theoretical accounts, which might very well grant the status of participant very widely in order to see all actions as part of one total system in which the "actants" (to use Bruno Latour's term) can be either artifacts or people. The appeal of such a view is that blurring affords a unified account of how the social world functions as a system. ... My purpose is

different. I am interested in meaning and learning, not just in descriptions of functioning systems. Therefore, the mutual ability to negotiate meaning and to recognise as experience of meaning in each other makes a difference among “actants”. (p. 286)

Latour’s analysis is useful if agency in processes within a system, regardless of whether the link is a computer or human actant, is the point of inquiry. If the focus is on learning, meaning and identity, then communities of practice is a more useful framework, which is the case for this study. This study does not embrace the actor-network-theory view of technology as an equal actant in a system, and it would not be productive here to attempt to reconcile the ontological and epistemological differences between these theories. This is because communities of practice theory supports this study in focusing on learning, identity, meaning and processes in ways the “social-material” actor-network-theory cannot with its focus on the process of growth and retraction of networks (Fox, 2005). Therefore, this study positions technology as an artifact or tool, in line with the ontology of the communities of practice framework, for investigating knowing in collaborative work of humans who have capacity for understanding and for making meaning.

Insufficient attention to power relations is another criticism of communities of practice theory as a framework. Contu and Willmott (2003) described the treatment of power relations in “situated learning theory” (Lave & Wenger, 1991) as an “embryonic appreciation” (p. 1). However, this study finds that communities of practices does pay attention to power appropriate to the purpose of the framework. In the 1991 text, a master legitimising an apprentice is more important than the “teaching”. In effect, the endorsement of the master has more impact on the apprentice’s journey than the skills learned. The way a community determines its membership involves power relations. The way an individual handles alignment is also about power and this is

discussed in the next section. Power also becomes relevant in relation to the concept of negotiation in communities of practice theory. Ultimately, the discussion of power relations is commensurate with its relevance to the purpose of this study.

This section has introduced the first phase of the communities of practice framework and begun the work of contextualising this study.

3.2 Phase Two: Learning, Meaning Identity

This next section is sizable because phase two includes the core concepts of the theory communities of practice theory, as well as the theorisation for designing for learning and then approaches for application of the theory—cultivating communities of practice. The concept of brokering and the role of technology stewards are also included here. The concept of brokering is set within the theorisation of the theory of communities or practice and the theorisation of technology stewarding is aimed at practical application.

The second phase of communities of practice theory was developed by Wenger (1998) in his expansion of existing social theories of learning by insisting that learning cannot be separated from practice. In the generative work, *Communities of Practice: Learning, Meaning, and Identity*, Wenger (1998) describes a theory for learning based on four “interconnected and mutually defining” (p. 5) components: identity, practice, meaning and community (see Figure 7). In later versions of this model, Wenger (2013) replaced the descriptors of the components with questions. Figure 7, adapted from both iterations, augments the original version with these questions. Wenger (1998) described the analytical power of the communities of practice framework as the integration of the four components of learning “while referring to a familiar experience” (p. 6).

This is a familiar experience, because communities of practice provides a language for what occurs when group formation develops over time as people come together in “sustained pursuit of a shared enterprise” (Wenger, 1998, p. 45). Communities of practice theory is the epistemological framework and entry point to the ontology of Wenger’s broader social theory of learning in this study.



Figure 7. Components of a Social Theory of Learning (adapted from, Wenger, 1998, p. 5, 2013, video lecture, 8 minutes 15 seconds). Adapted and Reproduced With Permission.

In earlier writings, Wenger referred to communities of practice as an entry point into a social theory of learning. The focus of Wenger’s theory offers a different level of analysis to Bandura’s social learning theory (Bandura, 1977), which takes into account “social interactions” from a “primarily psychological perspective ... useful for understanding the detailed information processing mechanisms by which social interactions affect behaviour” (Wenger, 1998, p. 280). Wenger (now Wenger-Trayner) now refers to himself as a social learning theorist and to his work

as social learning theory (Wenger-Trayner & Wenger-Trayner, 2015).

Clarification of the meaning of the term “community” is required because the meaning of this term in communities of practice theory differs from its common usage. The use of the term “community” has been problematic for researchers because, firstly, it is difficult to define and, secondly, it carries a connotation of harmony. Cox (2005) described Wenger’s definition as a postmodern conceptualisation that contrasts with many modernist perspectives. An example of a modernist definition highlights harmony and togetherness in community; a sense of community is “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986, p. 9). A succinct definition of a community of practice is “a persistent, sustained social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise” (Barab, MaKinster, & Scheckler, 2003, p. 238). Although this definition is useful, it does not capture the subtleties of the theory in regards to acknowledging the tensions that arise and that can be useful to a community of practice.

Wenger (1998) avoided the harmonious connotation of community “because mutual engagement does not require homogeneity, a joint enterprise does not mean agreement in any simple sense” (p. 78). A “negotiated enterprise” does not always happen smoothly in community of practice formation (Wenger, 1998, p. 78). In fact, disharmony is part of the process of learning and negotiating meaning in a community of practice and “in some communities, disagreement can be viewed as a productive part of the enterprise. The enterprise is joint not in that everybody believes the same thing or agrees with everything, but in that it is communally negotiated” (Wenger, 1998, p. 78). Cox (2005) synthesised modernist perspectives with Wenger’s perspective

(see Table 1). Henderson (2012) attributes the misuse of the communities of practice framework to researchers who do not acknowledge the nuanced differences between the theory and the vernacular use of the term community. In Table 1, the expected usage of the term community contrasts with Wenger’s use of community as specific to the enterprise, dynamic and conflictual, as well as harmonious. The differentiation of the definitions of community is important to this study as it is anticipated that the elements of Wenger’s (1998) postmodern view of community will provide a basis for a deeper analysis.

Table 1. Wenger’s Use of the Term Community (Cox, 2005, p. 532). Reproduced With Permission.

| Expected usage | Wenger’s (1998) usage |
|---|-------------------------------------|
| Tightly knit network | Tightly knit |
| Large scale | Uncertain scale, probably smaller |
| Neighbourhood-based (geographically situated) | Co-located in the workplace |
| Self-conscious/externally recognised | Not recognised, not clearly bounded |
| All-encompassing | Specific to the enterprise |
| Friendly, supportive | Conflictual as well as harmonious |
| Unpurposive | Purposive |
| Static | Ephemeral, creative |
| Born into | Voluntary |

Wenger (1998) identifies three dimensions of practice as the property of community: mutual engagement, joint enterprise and shared repertoire (see Figure 8). Mutual engagement describes people doing things together. Joint enterprise is the locally negotiated response to the enterprise. Shared repertoire is the enactment and representations of the enterprise developed as part of a community’s history of engagement. Wenger (1998) used a case study of a medical insurance firm, Alinsu (a pseudonym) to show how the claims processors learned in a local communities of practice. Practice exists, wrote Wenger (1998), “because people are engaged in

actions whose meanings they negotiate with one another” (p. 73). The “engagement in social practice” is “the fundamental process by which we learn and so become who we are” (Wenger, 1998, p. 45). Claims processors *become* claims processors through their engagement in the community of practice that had evolved among the processors as they worked with policy and the messy realities of claims processing to make it work for them (Wenger, 1998). Identity develops through participation and membership in the community of practice; i.e. learning how to become a claims processor.

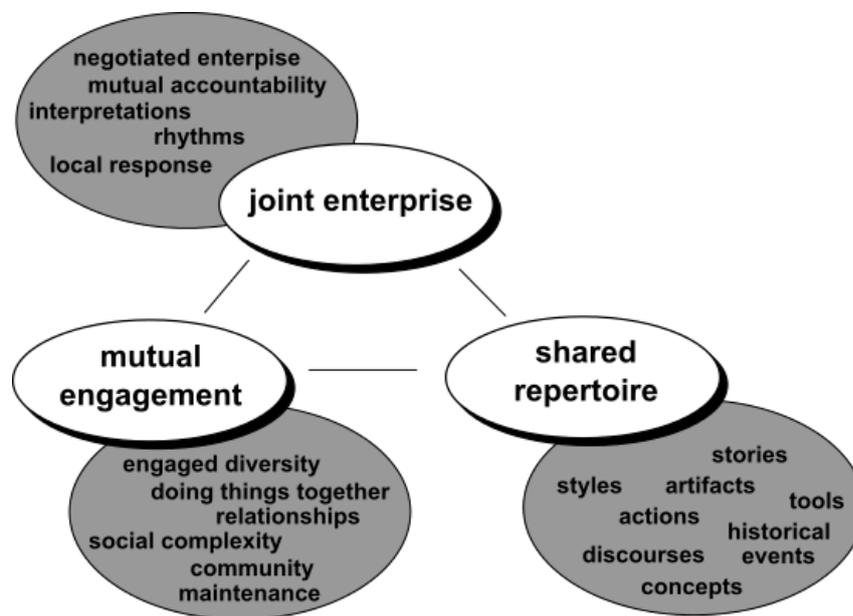


Figure 8. Three Dimensions of a Community of Practice (Wenger, 1998, p. 73). Reproduced With Permission.

The illustration of Alinsu claims processors has been criticised as being unable to depict the full potential of the kinds of learning that are supported by communities of practice (Contu & Willmott, 2003; DePalma, 2009). In effect, “this has limited the scope of Wenger’s theory to relatively simplistic, closed, and reproductive systems” (DePalma, 2009, p. 353). This is because

the joint enterprise of the Alinsu workers was to do the job of a claims processor. Innovation and creativity were not performance criteria for this role. Understanding the reasons behind processes was not necessary. Although the case study example illustrates a reproductive process, the theory also has “transformative potential” although the latter “has been less widely taken up and developed” (DePalma, 2009, p. 353). The study described by DePalma (2009) was able to consider ways the analysis of “a different institution ... can reinvigorate and broaden our understandings of the communities of practice model and point the way towards the possibility of learning and practice communities that are more transformative and less reproductive” (p. 353). Reproductive in this sense is in reference to the narrow role of claims processors in a corporate environment; transformative learning was not required. The present study is also able to contribute to theory in the analysis of a complex education community context with aspirations for transformative, rather than reproductive, outcomes.

Identifying and supporting existing communities of practice when approaching teacher professional learning in integrating technology has been supported by a number of studies (Glazer et al., 2009; Khalid et al., 2013; MacDonald, 2008; Sailin & Henderson, 2012). Based on the experiences of ten teacher participants in the context of a policy imperative, Malaysia’s Smart School Project, it was recommended that professional learning be restructured from individual or whole group to focus on “communities of practice which are already in place” including “leadership teams and subject departments” (Sailin & Henderson, 2012, p. 1). This is because of the way national curriculum and policy “is necessarily mediated by the teachers’ communities of practice” (p. 1). Another study reported by Khalid et al. (2013) made a similar recommendation for official acknowledgement of teacher learning in informal learning communities or communities of practice as part of their professional development.

Working with small groups of teachers is a structure that also allows individual needs to be met (Glazer et al., 2009; MacDonald, 2008). The finding that “teachers talking with teachers” was one of three major factors in high ICT integration is relevant to the present study in highlighting the importance of collegiality and tailoring professional learning to teachers’ needs (MacDonald, 2008). A development of the small-group professional learning model is found in the notion of the “collaborative apprenticeship” (Glazer & Hannafin, 2006) where “teacher-leaders with advanced knowledge, skill, and experience provide situated, ongoing, just in time support to peers as they develop and refine knowledge, skills, and resources for use in their classrooms” (Glazer et al., 2009, p. 23). Glazer et al. (2009) found that the collaborative apprenticeship model “supports teachers learning within communities of practice that are on-site, ongoing, and just in time“ (p. 36). The studies discussed in the last two paragraphs illustrate and support this research into the elearning community project in their focus on the joint enterprise of technology integration in schools in the context of technology integration agenda.

To explore the concept of communities of practice in relation to teacher professional learning, it is important to understand that they have their own processes, knowledge and rules for membership. Both periphery and legitimacy are prerequisites for moving to full participation in a community of practice. Wenger (1998) wrote that “in order to be on an inbound trajectory, newcomers must be granted enough legitimacy to be treated as potential members” (p. 101). Legitimacy equates to gaining enough acceptance by existing members to access the periphery of a community of practice and “can take many forms: being useful, being sponsored, being feared, being the right kind of person, having the right birth” (Wenger, 1998, p. 101). Fernando (2008) defined two types of legitimacy: conferred legitimacy, “which is that provided to a newcomer by an individual who is already part of a community” and personal legitimacy, “which is that

developed by an individual through direct interaction with a community” (p. xiv). Conferred legitimacy relates to the “sponsored” legitimacy Wenger identified. “Being useful” or “being the right kind of person” as described by Wenger fit with the personal legitimacy category. The concept of legitimacy is important to the present study because many of the project staff were newcomers to the schools and their acceptance (or not) into the communities of practice within the schools could affect the impact of their work with teachers in integrating technology into the curriculum.

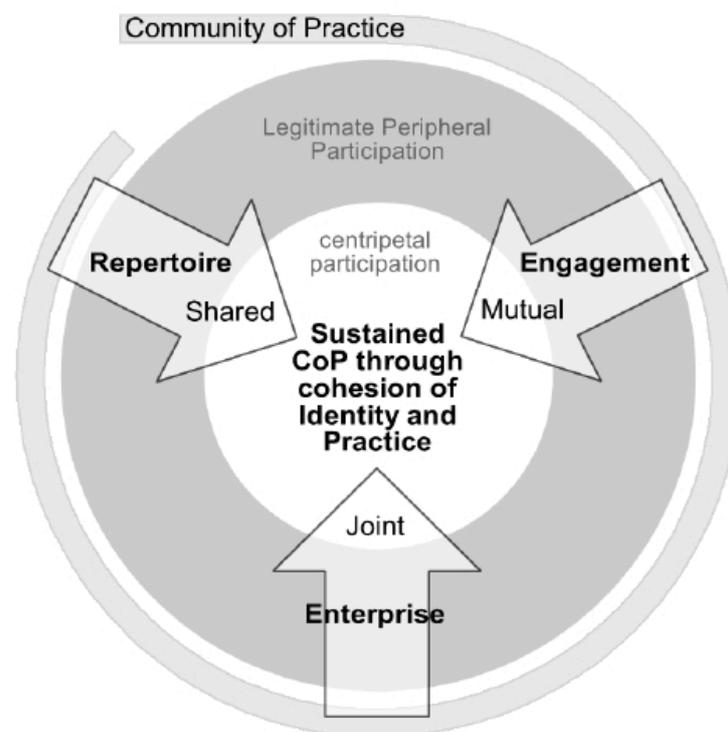


Figure 9. Model of Community Cohesion (Henderson, 2008, p. 1433). Published With Permission.

The three dimensions of practice together contribute to community coherence in that Wenger (1998) asserted that “practice is the source of coherence of a community” (p. 72).

Henderson (2008) focused on the concept of coherence in two case studies, one in Australia and one in England, in order to explore the role of community in sustaining teacher participation in blended professional development. Wenger (1998) saw “practice in participation and reification” as influencing the trajectory of a person through “continuity and discontinuity” (p. 90). Henderson extended communities of practice theory by connecting the elements of community coherence to sustaining professional learning of teachers through cohesion of identity and practice. In Figure 9, concepts from Lave and Wenger’s (1991) and Wenger’s (1998) communities of practice theory are fused and developed further by Henderson (2008). Another finding important to this study is the connection between relationships and sustainability of engagement as it offers further problematisation of the notion of community.

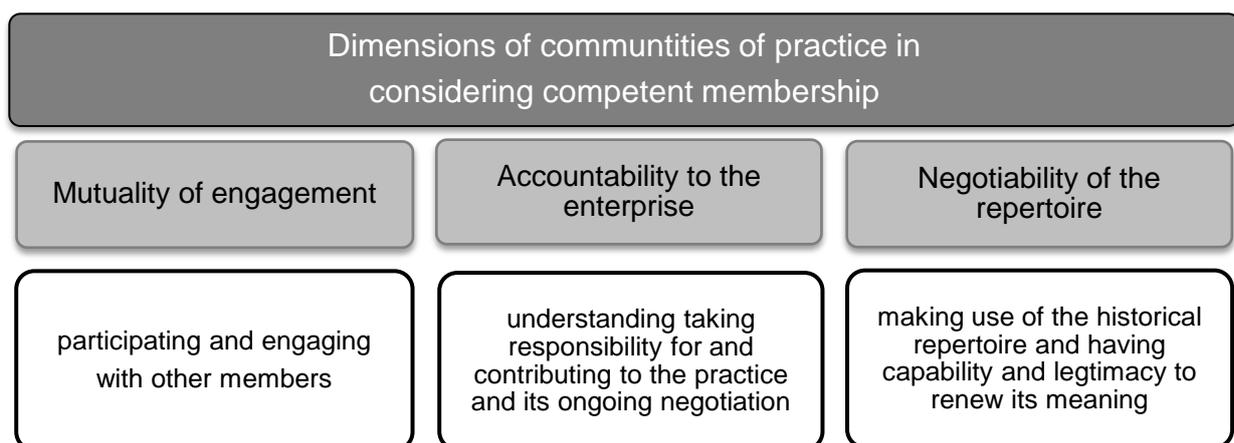


Figure 10. Dimensions of Communities of Practice in Considering Competent Membership
(adapted from text, Wenger, 1998, p. 137). Published With Permission.

In phase two of the theory, the concept of “competent membership” is positioned from the point of view of how an individual participates and is recognised within a single community of practice. Importantly, what constitutes competent membership is defined by the community in

that it is “locally negotiated regime of competence” (Wenger, 1998, p. 137). The three elements of a community of practice discussed earlier evolve to become “mutuality of engagement”, “accountability to the enterprise” and “negotiability of the repertoire” when considering competent membership (p. 137). Figure 10 represents these relationships.

Mutuality of engagement is the act of participating and interacting with other members. Accountability to the enterprise involves contributing to the practice through negotiating as a member of the community. Negotiability of the repertoire is making use of the historical repertoire and renewing its meaning. Repertoire can be imported or locally produced, where local production is indicative of a higher level of engagement (Wenger, 1998, p. 126). The link between the dimensions of a community of practice in Figure 8 and the dimensions of competent membership in Figure 10 will be useful for later analysis of the process of teachers negotiating the joint enterprise of integrating technology.

What it means to be a member in a community of practice in relation to identity can also be analysed from the perspective of the three “modes of belonging” described by Wenger (1998, p. 173). Identity formation is achieved through a “social ecology of identity” that involves engagement, imagination and alignment (p. 189). When a process of belonging is invested in, whether through “participation or non-participation”, this is called “identification” (pp. 190–191). Investing in these modes is also a process of “negotiability” (pp. 190–191). Engagement through experience with the world and others reflects in who we are. Imagination can occur when people see new possibilities for themselves through engaging with others. Alignment affects our identity in the way we respond to broader structures and this involves power. Alignment, according to Wenger (1998), “is a mode of belonging that is not confined to mutual engagement. The process

of alignment bridges time and space to form the broader enterprises so that participants become connected through the coordination of their energies, actions, and practices” (p. 179).

The modes of belonging are “infrastructures” in the “dimensions of design” in “a learning architecture” (Wenger, 1998, p. 237). Wenger (1998) wrote, “It is by combining these three modes that we can form learning communities” (p. 237). A study by Hartnell-Young (2006) that examined teachers learning in communities of practice found that “teachers were particularly interested in enhancing engagement through a constructivist approach” (p. 475). They supported imagination “through trust, openness and reflection” and alignment occurred with “common vision within the community” (p. 475). The social ecology of identity is a useful part of the communities of practice vocabulary and concepts regarding identity formation and change.

It is a central concept in communities of practice theory that meaning “arises out of a process of negotiation that combines both participation and reification” (Wenger, 1998, p. 135). Participation is the means for “knowing” through “active engagement in the world” (Wenger, 1998, p. 4). Participation involves “constructing identities in relation to these communities” (Wenger, 1998, p. 4). Participation entails the “possibility of mutual recognition” of others (p. 54). Reification can be thought of “the process and product” of making meaning expressed as “abstractions, tools, symbols, stories, terms and concepts” (Wenger, 1998, p. 59). The “convergence” of participation and reification that is the basis for “negotiation of meaning” (Wenger, 1998, p. 55) in practice.

It is through participation and reification as dimensions of practice and identity that influence can be made in the trajectory of a person (Wenger, 1998, p. 233). This juncture of the learning process presents the potential for change. A principle for design then is that “practice is

always distributed between participation and reification – and its realisation depends on how these two sides fit together” (p. 232). The “duality” of participation and reification occurs through the negotiation of meaning “so seamlessly that meaning seems to have its own unitary, self-contained existence” (p. 63). Figure 11 represents the duality of participation and reification. Wenger (1998) explained that “we project our meanings into the world and then we perceive them as existing in the world, as having a reality of their own” (p. 58). This “affordance for negotiating meaning” can be achieved in two ways: “1) make sure that some artifacts are in place ... and 2) ... the right people are at the right place in the right kind of relation to make something happen” (pp. 231-232). The present study investigates whether an elearning community was able to achieve this affordance of meaning through the work of the project staff.

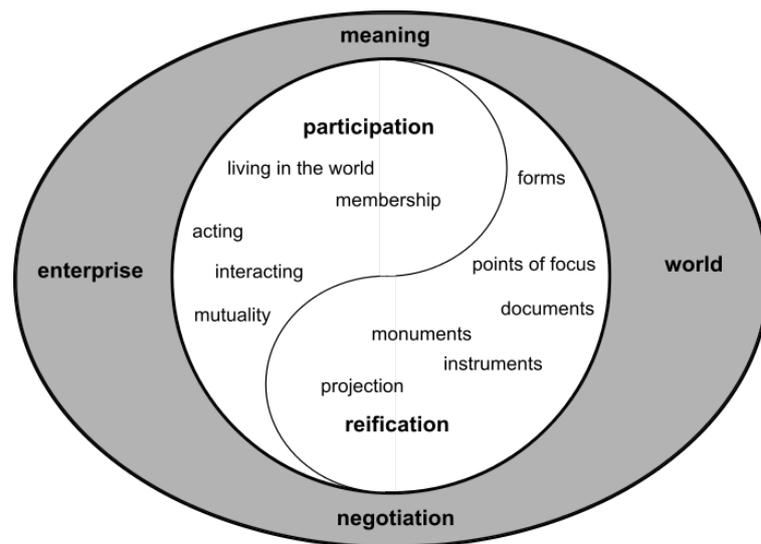


Figure 11. The Duality of Participation and Reification (Wenger, 1998, p. 63). Reproduced With Permission.

Indicators that a community of practice has formed include:

1. Sustained mutual relationships

2. Shared ways of engaging in doing things together
3. The rapid flow of information and propagation of innovation
4. Absence of introductory preambles, as if conversation and interactions were merely the continuation of an ongoing process
5. Very quick setup of a problem to be discussed
6. Substantial overlap in participants' description of who belongs
7. Knowing what others know, what they can do, and how they can contribute to the enterprise
8. Mutually defining identities
9. The ability to assess the appropriateness of actions and products
10. Specific tools, representations and other artifacts
11. Local lore, shared stories, inside jokes, knowing laughter
12. Jargon and shortcuts to communication as well as the ease of producing new ones
13. Certain styles recognised as displaying membership
14. A shared discourse reflecting a certain perspective on the world. (Wenger, 1998, pp. 125–126)

These are indicators that the three dimensions of a community of practice “are present to a substantial degree” (Wenger, 1998, p. 126). A clear distinction between what is a community of practice, and what is a larger grouping, is not definable because the concept of communities of practice is about “learning as a living experience of negotiating meaning—not about form” (Wenger, 1998, p. 229). This lack of definition of the boundaries of a community of practice has important implications for this study in that it is not possible to clarify the exact configurations of communities of practice within the network of schools.

Boundaries of communities of practice may be unclear to outsiders. The concept of “boundaries” is important in that they “are a sign that communities of practice are deepening, that their shared histories give rise to significant differences between inside and outside” (Wenger, 1998, p. 253). It is hard to delineate the boundary of a community of practice because:

It is not necessary that all participants interact with each other intensely with everyone else or know each other very well—but the less they do, the more their configuration looks like a personal network or a set of inter-related practices rather than a single community of practice. (Wenger, 1998, p. 126)

The interrelated practices might indicate a “constellation of practice” due to discontinuities, thus indicating *multiple* communities of practice. Discontinuities form boundaries, which is important in considering learning in practice. Boundaries are “a learning resource in their own right” because they “create interplays of experience and competence” (Wenger, 1998, p. 254). Wenger (1998) warned that “treating some configurations as a single community of practice would gloss over the discontinuities that are integral to the very structure. They can profitably be viewed as constellations of interconnected practices” (p. 127). Wenger (1998) did provide the following indicators that might be observed in communities of practice that form a constellation of practices:

1. Having shared historical roots
2. Having related enterprises
3. Serving a cause or belonging to the same institution
4. Facing similar conditions
5. Having members in common

6. Sharing artifacts
7. Having geographical relations of proximity or interaction
8. Having overlapping styles or discourses
9. Competing for the same resources (p. 127)

Consideration of communities of practice boundaries in the context of the intersection of single communities of practices, bound as a constellation, is important to this study across multiple school sites. In the same way that it is difficult to determine the boundaries of a community of practice it is also difficult to define the boundaries of a constellation of practice. This issue was discussed in the work of Schlager and Fusco (2003), who struggled with defining the online “Tapped In” community. Although many characteristics of a community of practice were present, they “struggled to define *the practice*” (p. 204). While the teachers from the Tapped In community seemed to belong to multiple and some overlapping communities of practice, Schlager and Fusco (2003) suggested that Tapped In “may be better described as a *network of practice* (Brown & Duguid, 2000), a *constellation of practices* (Wenger, 1998), or a *crossroads* [a term they attribute to Linda Polin] of multiple educator communities” (emphasis in original, p. 204). Riel and Polin (2001) used the term “crossroads” to refer to the Tapped In community in that it was a “variety of communities with a shared larger purpose” (p. 27). The grouping considered by the Tapped In community is unlikely to be the same configuration as the phenomenon of the elearning community in this study and this issue will be reconsidered during the analysis phase.

It is worth pausing here to consider the concept of “network of practice” as defined by Brown and Duguid (2000). Brown and Duguid worked closely with both Lave and Wenger. This association has strongly influenced the work of Brown and Duguid, but there are some important

differences and departures in their work. Brown and Duguid (2000) identified “two types of work related networks” (p. 141). Firstly, they defined networks of practice broadly in terms of people who “work on similar practices” (Brown & Duguid, 2000, p. 141). The second type of network they identified is “communities of practice”, following Lave and Wenger. It was not a condition of a community of practice in Wenger’s (1998) version that the members necessarily know each other, as cited in Brown and Duguid’s interpretation of Lave and Wenger’s (1991) explanation.

In a network of practice, it is not a criterion that the people know one another. Therefore a synonym for this might be “occupational groups” where these “networks have practice and knowledge in common” (Brown & Duguid, 2000, p. 141). Brown and Duguid explained that this kind of network is usually through indirect, third party means such as newsletters and websites. They identified the 25,000 representatives of Xerox as such a network. They did identify that in such a network there is little “reciprocity” in that “network members don’t interact with each other directly to any significant degree” (p. 142). Brown and Duguid’s network of practice can be thought of as an information dissemination network, rather than a social connection network. The Tapped In network differs from Brown and Duguid’s network of practice in that the site offers opportunities for engaging in professional learning with other teachers. The Tapped In community is more than a network of practice as defined by Brown and Duguid.

This section has drawn together the main concepts of communities of practice theory that relate to this study. The roles of brokers and technology stewards in brokering knowledge within and across boundaries is the topic of the next subsection.

3.2.1 Brokering across boundaries and technology stewarding

This subsection discusses the process of brokering performed by people who gain enough legitimacy to share ideas and make connections across communities of practice. Also discussed here is the role of a “technology steward” who supports technology integration in local contexts and may perform brokering practices across communities. A number of studies that illuminate the concepts and contextualisation of broking and technology stewarding in relation to this study are included here.

The concept of brokering originates in other fields and is synonymous with other terms. The term as used in the context of research has been referenced at least as early as the anthropological study of group relations by Wolf (1956). The term has a longer etymology in relation to economics and was used by Mortimer (1791) to describe how government securities may be bought without using a broker to facilitate the exchange. Meyer (2010) used the term “knowledge broker” to describe “people or organisations that move knowledge around and create connections between researchers and their various audiences” (p. 118). In business, the terms used are “agent, promoter, dealer, fixer, trader, someone who buys and sells” (Jackson, 2003, p. 4) and “innovation broker” (Batterink, 2009). In politics, someone who does the work of a broker might be described as a “diplomat, mediator, go-between, and negotiator” (Jackson, 2003, p. 4) or honest broker (Pielke, 2007). In the information field, a broker is “someone who knows how to access or acquire information and who provides a gateway to information resources” (Jackson, 2003, p. 4). In science, the term “knowledge broker” (Meyer, 2010) has been used.

In education, a broker is “a facilitator who connects people, networks, organisations, and resources and establishes the conditions to create something new or add value to something that

already exists” (Jackson, 2003, p. 4). The term “change agent” (Barab et al., 2003; Duignan, 2006; Fullan, 2006) has also been used in education to describe someone who performs some of the work of brokering practices. Wenger (1998) acknowledged his colleague Penelope Eckert, who, in a personal communication, introduced the term “brokering” in reference to her work with schoolchildren and their cliques. In Eckert’s (1988) study, the jocks were able to broker between their peer group and adults who could give permission to hold social functions and grant access to facilities. Wenger (1998) defined brokering as “connections provided by people who can introduce elements of one practice to another” (p. 105). The practice of brokering is a way that new ideas can be introduced to and adapted by communities.

Wenger (1998) pointed out that while we “all do some brokering, certain individuals seem to thrive on being brokers: they love to create connections and engage in ‘import-export,’ and so would rather stay at the boundaries of many practices than move to the core of any one practice” (p. 109). Being helpful or being the right kind of person might be enough to ascribe legitimacy. Fernando’s (2008) study, mentioned in relation to the development of the concept of legitimacy earlier, “found evidence to support the view that the key to effective brokering between communities is legitimacy” (p. xiii). In the case considered by Eckert, the other members of the teenagers’ communities determined legitimacy. Davies (2005) raised the idea that a potential difference in Wenger’s communities is that some people may be legitimised by their work role. This may have been the case in the Alinsu example, but the theorisation of legitimacy includes other presentations, as previously discussed. The present study explores the ways the coaches in the elearning community gained legitimacy.

Belonging to multiple communities of practice, or having “multimembership”, affords the opportunity to broker across the boundaries of communities of practice (Wenger, 1998). Not only

do brokers move around knowledge, but they also create the opportunity for “a new kind of knowledge: brokered knowledge” (Mayer & Lloyd, 2010, p. 118). This reflects Wenger (1998) proposal that aside from being able to “make new connections across communities of practice”, good brokers “open possibilities for new meanings” (p. 109). Another useful concept in considering spanning boundaries is that of “boundary objects”. These are “artifacts, documents, terms, concepts, and other forms of reification around which communities of practice can organise their interconnection” (Wenger, 1998, p. 105). The nexus of multiple perspectives available through connections with brokering and boundary objects that can be negotiated as new practices through processes of participation and reification is depicted in Figure 12. Wenger’s (1998) descriptions of the roles of brokers, boundaries and boundary objects are important to this research as there may be similarities in the roles of the coaches and resources developed in the elearning community project.

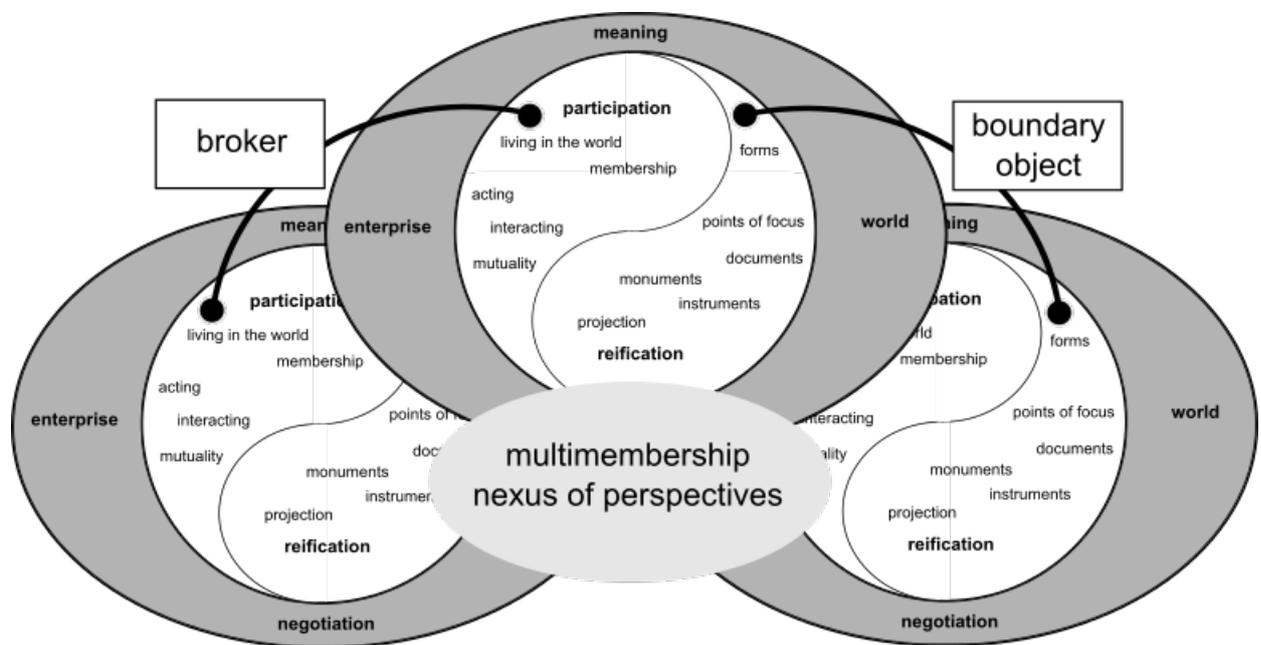


Figure 12. Participation and Reification as Connections (Wenger, 1998, p. 105). Reproduced With Permission.

Facilitation of professional learning can be a way that ideas are brokered. In Henderson's (2007) study into sustaining teacher participation in professional learning in integrating technology, the course facilitator acted as a broker and this was "an important element in bridging the boundaries between computer literate and illiterate teaching practitioners" (pp. 57–58). In this example, the broker was able to introduce new technology integration practices to the community of participants. Teachers in schools settings are likely to sit somewhere on a spectrum of computer literacy. Some may be computer literate or at least use technology for administrative tasks, but be at a loss as to how to use digital technologies effectively in their classrooms. This study looks further into the concept of brokering and technology stewarding, with a focus on the coaches sharing ideas.

In the City to Surf Project documented in the study by Hartnell-Young (2006), it was apparent that some teachers acted as brokers across classrooms and school boundaries by engaging in professional learning through curriculum projects with other teachers and students (p. 473). Although this was the case in some circumstances, Hartnell-Young (2006) acknowledged that others remained "islands of excellence with no ferry service" (Reilly, 1999, p. 1). This is because multimembership does not automatically mean brokering takes place, because it is a separate form of participation in itself (Wenger, 1998, p. 109). Opportunities for cross-school and cross-sector knowledge development were also evident in the Australian School Innovation in Science, Technology and Mathematics (ASISTM) case studies (Tytler et al., 2008). The concept of knowledge brokering across boundaries of multiple communities of practice is relevant to the present study, which focuses on a cluster of schools. However, grouping people together or assigning a coordinator to a group does not guarantee the acceptance or legitimacy of a person within a community of practice. This is due to the self-governing nature of communities of

practice. The present study makes a further contribution in this area by looking at the notions of legitimacy, multimembership, brokering and the benefits of boundary crossing through schools becoming a clustered group.

A broker can also “enable coordination” (Wenger, 1998, p. 109). It was most likely that the Project Team would act as brokers in the elearning community. Wenger (1998) also suggested that to harness the “usefulness of simultaneous membership” in spreading information in communities of practice of co-workers requires “multimembership to be elevated to an organisational principle” (p. 252). If a person is perceived to have legitimacy then they “belong” at least at the periphery, and even for short time the possibility of new practices to be considered and negotiated locally occurs. It might be possible to investigate the dynamics of those who thrive in this role of brokering and choose to operate on the periphery of the communities of practice in this study.

Included as a component of phase two is discussion of technology stewards, a role that has emerged from the need for supporting communities with digital technologies and “typically includes selecting and configuring technology, as well as supporting its use in the practice of the community” (Wenger et al., 2009, p. 25). Technology stewards are “people with enough experience of the workings of a community to understand its technology needs, and enough experience with or interest in technology to take leadership in addressing those needs” (Wenger et al., 2009, p. 25). This role differs to that of a computer technician in a school, as the emphasis is on understanding the community needs from an insider perspective, not the technology *per se* as the primary focus (Wenger et al., 2009, p. 25). An example of a position developed to fulfil the role of a technology steward was that of an elearning coach as described by Skues and Cunningham (2013). The project context of the study stipulated that the coach’s role was to focus

on teacher learning needs, rather than providing system support akin to a computer technician role. Similarly, the setting of the present study stipulated that the coaches' role was to assist teachers with the teaching and learning aspect of technology, not the maintenance.

Cochrane's (2011) study drew heavily on the technology steward concept. He concluded that the "symbiotic relationship developed between the researcher (as the technology steward) and the lecturers involved in each of the mobile learning projects has proven to be a vital partnership for harnessing mobile web 2.0 technologies to design social constructivist learning environments for different groups of tertiary students" (p. 421). Cochran contributed to the theorisation of the technology steward by demonstrating in practice the benefits of identifying a technology steward to support the sustained engagement of intentional communities of practice with the joint enterprise of developing social constructivist pedagogies, particularly "student-generated content and student-generated contexts" (p. 411). This highlights the importance of the social processes of learning in integrating technology. This resulted in an implementation model that is potentially applicable to other contexts (Cochran, 2011). Cochran described this process as "reproducing intentional communities of practice" (p. 380). The concept of intentional communities of practice considered is further in the next subsection.

The work of brokering is often performed by those who are technology stewards (Wenger et al., 2009). They note that:

Tech Stewards often serve as brokers between the community and the technical resources in its vicinity, such as an IT department, an open-source community, or a vendor's support organization. A broker is in a position to appreciate the concerns and knowledge of people who cannot always talk to each other directly. Good stewarding involves knowing who

might know what and bringing into their community relevant perspectives, ideas, or possibilities from other practices. (p. 28)

However, it is important to note that anyone can perform brokering practices. A job title does not guarantee that brokering practices occur. In the same way, Wenger (1998) pointed out the usefulness for brokers in seeking out other brokers for support and to avoid “uprootedness”. Wenger, White and Smith (2009) recommended that it can be helpful for technology stewards to “connect with other stewards (from whatever community) who can provide a larger context, offer support, share ideas, tips, and innovation” (p. 25). Some technology stewards support multiple communities within or across boundaries. This study considers these ideas further in the analysis of the case.

One of the problems brokers may face due to the peripheral nature of the membership that they have across communities of practice is “uprootedness”, described as “an occupational hazard of brokering” (Wenger, 1998, p. 110). There was discomfort for the claims processing unit supervisor in spanning both the workers and management because “she belongs at the same time to both practices and to neither” (p. 109). This occurs because “boundaries can lack the kind of negotiated understanding found at the core of practice about what constitutes competence” (p. 110). To operate at a boundary, a broker needs “enough distance to bring a different perspective, but also enough legitimacy to be listened to” (p. 110). Brokers must manage this while being neither in (membership) nor out (non-membership) as their contribution occurs at this nexus. The uprootedness experienced by brokers can be resolved by “recognising” other brokers to seek out for support and sharing of experiences and ideas (Wenger, 1998). Brokers “may even develop shared practices around the enterprise of brokering” (Wenger, 1998, p. 110). This present study

also contributes to the conversation on shared practices around the enterprise of broking and brokered knowledge.

This subsection has expounded on the important roles performed by brokers and technology stewards in supporting and influencing communities of practice. The focus of the next subsection is designing for learning and the idea of cultivating communities of practice.

3.2.2 Designing for learning and cultivating communities of practice

This subsection focuses on design for learning as presented by Wenger (1998) and cultivating communities of practice (Wenger et al., 2002). Wenger (1998) laid the foundations for cultivating communities of practice that is the main focus expounded in Wenger, McDermott and Snyder (2002). The ideas and issues around whether it is possible to create or cultivate a community of practice are discussed here.

The concept of “designing for learning” in the context of communities of practice was introduced by Wenger (1998) whereby “design creates fields of identification and negotiability that orient the practices and identities of those involved to various forms of participation and non-participation” (p. 235). Both Henderson (2007), in the way he constructed blended learning in integrating technology for his teacher participants, and Hartnell-Young (2006), in considering the role of teachers in and across classrooms, engaged in design for learning in a communities of practice. Both studies acknowledged that it is possible to design for learning but not to design the learning, in line with Wenger’s (1998) conception that communities of practice can “be recognised, supported, encouraged, and nurtured, but they are not reified, designable units” (p. 229). In this way, design is distinguished from the response to the design (Wenger, 1998, p. 229). This is because engagement happens locally and no practice is global.

Critics have perceived that Wenger departed from the original notions in writing about communities of practice as organisational assets. “Some critics lament the loss of Lave’s influence in his [Wenger’s] later writings” (DePalma, 2009, p. 354). It was Barton and Tusting (2005b) who expressed this: “We were concerned that the critical edge of earlier work has been lost, that is the contribution of Jean Lave had been eclipsed and that the ideas were being taken over by the certainty and oversimplification of management training” (p. 6). Lea’s (2005) chapter in Barton and Tusting’s (2005a) edited book picks up this point:

It is important to reclaim the early work on communities of practice for its heuristic qualities – a way of understanding learning as practice. This is in contrast to a top-down educational model, when practitioners aim to foster communities of practice artificially in their own particular context. (p. 181)

The stance taken in this research is that as a model, it need not be top-down or reproductive. It is possible to preserve the heuristic and transformative qualities even if institutions try to cultivate communities of practice. This study looks at a project that proposed the development of a community. Whilst the term “intentional communities of practice” was not explicit, there was an intent to promote community collaboration, as evident in the project proposal. The researcher believes it is possible to promote environments that allow more flexibility and ability for practitioners to develop the approaches that best suit the context.

Considering the broader picture is relevant when designing for learning because it “requires new connections among localities, connections that do justice to the inherent knowledge of engagement in practice while at the same time recognising its inherent locality” (Wenger, 1998, p. 234). For example, if teachers globally are responding to the technology agenda, the

response happens “locally in terms of engagement” (Wenger, 1998, p. 234) as this is where practice occurs. This is important in the context of this study, which involves a local implementation of a global agenda for technology integration, because “communities of practice are only part of the broader constellations in which their learning is relevant” (Wenger, 1998, p. 234). In the context of this study, the broader constellations and “landscapes of practice” (Wenger, 1998, p. 131) are part of the framework used to consider the ways practices are negotiated locally in the elearning community.

There is a paucity in the literature in the use of communities of practice theory to view professional learning in cluster school settings where the aim is building the capacity of teachers in integrating technology into the curriculum. Hartnell-Young (2006) identified teacher professional learning in communities of practice occurring in and across schools clustered due to their participation in collaborative projects. The purpose of the study was to explore the communities of practice characteristics that are evident in classrooms in order to explore the roles “knowledge-building teachers play in classrooms using computers” (p. 462). The study also contributed to the “rarely documented” area about “how clusters operate within and across classrooms” (Hartnell-Young, 2006, p. 462). An important finding was that “while such projects were initiated and driven by individuals and groups of teachers, their success required support through school leadership and organization and state-wide technology infrastructure and funding” (p. 461). The study also raised the potential issue that “the top down nature of some of these programs can be in tension with a constructivist view of teacher learning” (p. 462). The way the teachers worked across schools is similar to the way coaches worked in making connections in the case of the elearning community for the present study.

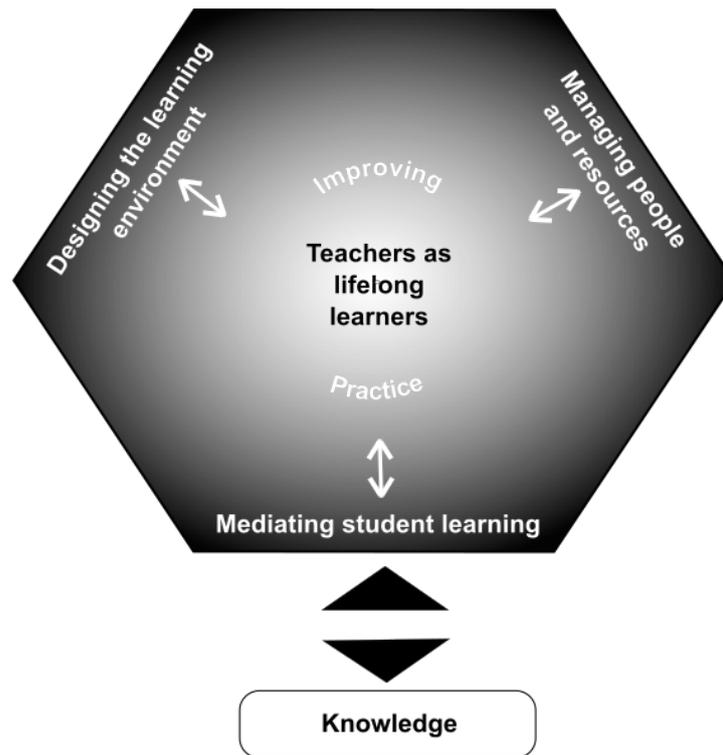


Figure 13. Four Roles of Teachers in Classroom Communities of Practice (Hartnell-Young, 2006, p. 463). Reproduced With Permission.

Hartnell-Young (2006) made an original contribution to the field of research in describing the roles of knowledge-building teachers within classroom communities of practice. The four roles identified are: (a) designing the learning environment; (b) managing people and resources; (c) mediating student learning; and (d) improving practice (see Figure 13). With respect to the modes of belonging: imagination, alignment and engagement, she concluded that teachers used technology in a range of ways to create classroom communities that build knowledge. The study also suggested the decoupling of these roles in job descriptions and performance reviews to simplify the complexity of a teacher's roles. While classrooms as sites of communities of practice is not the focus of this research, Hartnell-Young's study made important contributions to understanding integrating technology in school environments, including the opportunities for

teacher professional learning, when schools are positioned as clusters. Consideration of these ideas around designing for learning in communities of practice serves as a lead-in to consideration of the cultivation of communities of practice.

Table 2. Contrasting Teams and Communities of Practice (McDermott, 1999, p. 34).

Reproduced With Permission.

| Teams | Communities of Practice |
|--|---|
| Driven by deliverables <ul style="list-style-type: none"> • Shared goals and results • Value defined by charter • Value in result delivered | Driven by value <ul style="list-style-type: none"> • Shared interest or practice • Value discovered/evolves • Value in ongoing process |
| Defined by task <ul style="list-style-type: none"> • Interdependent tasks • Clear boundaries | Defined by knowledge <ul style="list-style-type: none"> • Interdependent knowledge • Permeable boundaries |
| Develops through a work plan <ul style="list-style-type: none"> • Everyone contributes • Managed objectives through objectives & work plan | Develops organically <ul style="list-style-type: none"> • Variable contribution • Managed by making connections |
| Bound by commitment <ul style="list-style-type: none"> • Joint accountability • Based on explicit agreement • Team leader or manager | Bound to identity <ul style="list-style-type: none"> • Reciprocal contributions • Based on trust • Core group/coordinator |

Many organisations and institutions would like to be able to harness the power of the understanding of learning the communities of practice theory describes. McDermott’s (1999) comparison between of teams and communities of practice is depicted in Table 2. The cultivation of communities of practice was considered by McDermott (1999):

To share learning across teams, it is necessary to extend natural networking across the chasm of isolation. This means that you need to create *intentional* COPs [communities of practice]. These are intentional in their focus, start-up activities and support, but to develop the trust, connection and sharing of natural communities it is necessary to support

the natural process of community development rather than impose an artificial one.

(Emphasis in original, p. 35-36)

McDermott (1999) argued that organisations need to create intentional communities of practice in their start-up phase and, importantly, he stressed supporting the natural processes of the community.

McDermott later joined Wenger and Snyder in the book *Cultivating Communities of Practice*. Wenger, McDermott and Snyder (2002) derived seven principles for the creation of communities of practice:

1. Design for evolution
2. Open a dialogue between inside and outside perspectives
3. Invite different levels of participation
4. Develop both public and private community spaces
5. Focus on value
6. Combine familiarity and excitement
7. Create the rhythm for the community (p. 51)

Wenger, et al. (2002) also developed a model of the degrees of community participation (see Figure 14). They describe the fluidity of participation in that participants will shift in and out of the levels of participation.

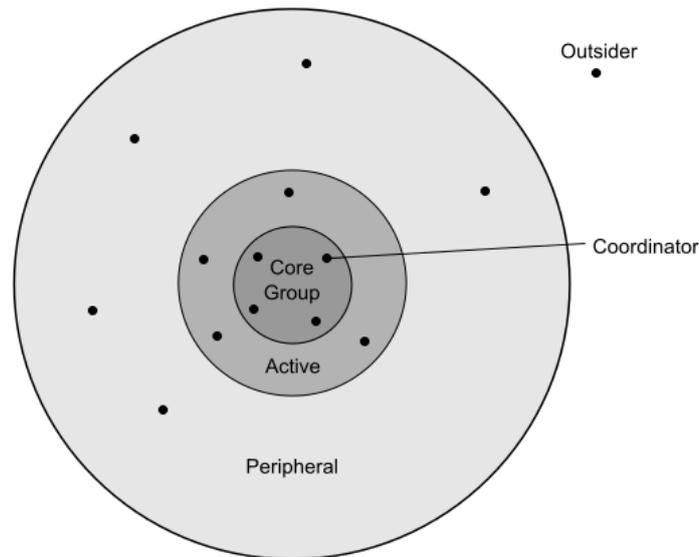


Figure 14. Degrees of Community Participation (Wenger et al., 2002, p. 57). Reproduced With Permission.

There have been criticisms of those who try to “implement” a community of practice in its original 1998 form, both because it tends to be done in a very superficial way (notwithstanding the complexity of what makes a community of practice) and also because of the grassroots nature and organic development of a community of practice. Some researchers have leveraged communities of practice to engage learners for professional development. Cochrane (2011) conducted a study which resulted in the development of an intentional communities of practice approach for higher education teachers. Cochrane’s participatory action research included five case studies, each of a course conducted at a higher education institution, and found that “an intentional community of practice model provides a sustainable framework for pedagogical support of mlearning projects” (p. 421). Cochrane’s project did not initially set out to create a community of practice but discovered that one had developed. This led to developing intentional communities of practice.

Whether communities of practice can be “created”, is a major point of contention for some critics who stress that they are self-governing entities. The strong reaction to the idea of creation of communities of practice might be because the basic premise that a community of practice is that is not an externally imposed structure and will always “remain distinct from its institutionalisation” (Wenger, 1998, p. 229). This study agrees that the relationship between institution and practice can never be congruous as it is a continual process of negotiated alignment. However, it is possible to “provide institutionalised support for learning” (p. 229). Some critics have argued that the ideas in the Wenger (1998) text and the Wenger et al. (2002) work should be considered different theories altogether (Cox, 2005; Fernando, 2008; Henderson, 2012). Cox (2005) recognised that the Lave and Wenger (1991) and Wenger (1998) works shared a “common epistemological view” (p. 527) in “their view of meaning as locally and socially constructed, and in placing identity as central to learning” (p. 528). However, Cox argued the Wenger et al. (2002) work “marks a distinct shift towards a managerialist stance” (p. 527). The researcher acknowledges Cox’s thorough investigation of the differences in these works and the warning that it is “essential to position any use in relation to one of these versions” (Cox, 2005, p. 536).

Simplification of the concepts between the 1998 and 2002 versions was cited as a reason by Fernando (2008) for his choice in limiting his framework to the 1998 text for his PhD thesis research. Fernando (2008) explained his rationale: “In order to strengthen the analytical generalisability of this study, the theoretical focus has been limited to Wenger’s 1998 communities of practice framework” (p. 5). It can be agreed that Wenger’s (1998) text had its foundations in situated learning theories (Fernando, 2008) and that the question of how situated learning theories in general can be operationalised has been raised (Herrington & Oliver, 2000).

However, Wenger's (1998) framework, although grounded in situated learning theory, takes steps towards operationalisation in considering how to design for learning through communities of practice. There are correlations between what was presented in Wenger (1998) of the theory in terms of communities of practice being described by as "organisational assets" (p. 253). The problem of difficulty in operationalisation is not completely resolved in the Wenger et al. (2002) work and in fact, it has problematised the theory further.

Others such as Dillion (2005) perceived that "it is useful to consider a recent extension of the idea of communities of practice as proposed by Wenger, McDermott and Snyder (2002, p. 27)" (p. 28). The concepts of domain, community and practice are simplified versions of the concepts in the 1998 text. According to Dillion (2005) the additional term domain of knowledge was introduced to place greater emphasis on the context of learning (p. 28). For Dillon, these concepts have been useful in describing the context of the study:

In the context of this study, a community of practice is a group of people who share a common interest in the theory and practice of teacher librarianship and related information professions (domain), who share a particular language for talking about the various aspects of these disciplines (practice), and who use tools and sense-making approaches for constructing knowledge and for capacity building (community). In this sense, the degree to which OZTL_NET subscribers learn through their engagement with the listserv and through their interactions with others online needs to be determined. (p. 28)

Relating these concepts to the present study, the participants share an interest in developing student-centred, technology-rich curriculum (domain), are working with similar approaches to curriculum and uses of technology (practice), and have come together as a community that

“creates the social fabric of learning” (Wenger et al., 2002, p. 27). The determination of a community of practice will relies on how well these elements functioning well together and become a social structure for the development and sharing of knowledge. However, the use of the communities of practice framework in understanding the processes of phenomena is more important than determining whether a community of practice is operating or not. This is due to the ever-changing dynamic of group formation and dissolution.

A noteworthy contribution to the field incorporating community of practice theory as a methodology for researching technology integration in a community context was developed by Jaipal (2007). The sociocultural framework was designed to inform research into facilitation of the development of collaborative learning communities in technology integration. Jaipal incorporated the 2002 concepts of domain, community and shared practices, juxtaposed with the cognitive, social and affective aspects.. Jaipal’s framework incorporates Fullan’s idea of the “top-down” and “bottom-up” approach to leadership that is useful in considering how communities might balance the “structure and flexibility” that Jaipal (2007, p. 1518) proposed is required for collaborative learning communities. Jaipal (2007) envisioned that his framework might be used to “illuminate the processes and tensions involved as the community evolves” (p. 1518). He selected a limited number of Wenger’s conceptions designed to “illuminate to generic attributes of the collaborative process” (p. 1518). Table 3 depicts Jaipal’s framework.

This study does not adopt Jaipal’s selection of concepts as the Wenger (1998) version of communities of practice theory has been chosen and it would be an oversight not to engage with broader ideas relating to brokering between communities and learning in landscapes of practice. Furthermore, the scope of this research does not include actual facilitation of the development of a collaborative community for which purpose Jaipal’s framework was developed. As a staff

member of the project, it could be argued that the researcher is also a participant involved in the community's development; however, this research was not designed to have an influencing effect on the community's development, as would have been the case if action research methodology or a framework such as Jaipal's had been selected. For the reasons outlined here, Jaipal's (2007) framework informs the scoping of my study but not the analysis.

Table 3: A Sociocultural Framework for Developing a Collaborative Learning Community in Teacher Education (Jaipal, 2007, p. 1521). Reproduced With Permission.

| | Cognitive | Social | Affective |
|--|---|---|---|
| Domain – topic, issues, knowledge and skills | Identifying a set of issues, knowledge and skills that needs to be enhanced/changed e.g. collaborative discussion of common concerns/issues that will benefit school and university | Establishing well-defined goals to set boundaries and relationships to other domains and society e.g. agreeing on what issues and topics within a domain to focus on, understanding the limitations of technology integration | Maintaining internal and external accountability guided by standards and ethics associated with the domain e.g. using technology standards (ISTE) to guide development of technology-enhanced curricula |
| Community – a group of people with different skillsets who care about the domain | Developing joint/collaborative expertise in knowledge and skills of domain e.g. teachers and pre-service teachers sharing technology expertise with less skilled colleagues | Engaging in voluntary, sustained interactions fostering trust, respect, mutual commitment, identity formation, accountability and distributed leadership e.g. members with more expertise in different areas of technology integration take on greater leadership roles | Embracing mutual respect, team building, compassion, diversity, conflict, contradiction arising from different personal values, principles, motivations, roles and expectations e.g. using team building and conflict resolution to promote constructive growth |
| Shared practices – outcomes, artefacts, processes | Developing practices enhancing effectiveness of knowledge and skills, and enhancing expertise of individuals and groups e.g. technology-integrated curricula enhancing student learning and application of pedagogical strategies in classroom practice | Developing practices enhancing and supporting the process of forming and sustaining a CLC e.g. sustained sessions to share ideas, develop trust and identify common interests and goals e.g. reflecting on the process of collaboration | Developing respect and trust for shared practices, the CLC process and self; developing confidence in using shared practices to benefit self and others e.g. developing confidence by using technology-integrated curricula in classroom practice |

Probst and Borzillo (2008) describe communities of practice as an increasingly important intra-organisational structure well suited to the development and sharing of knowledge across divisions. They studied 57 communities of practice from major European and US companies and came up with 10 governance mechanisms that lead to the successful development and sharing of best practice, and described five main reasons for failure. Their study investigated existing communities of practice to synthesise reasons for success and failure. The seven schools in this study, although they came under the banner of an elearning community, were still operating as separate institutions. Therefore, a wider view of learning inter-organisationally is needed. My research sits somewhere between this view of communities of practice within organisations and draws on the wider constellations of practice. The idea of landscapes of practice is discussed in phase three. One problem for this research to resolve is in considering structures that are more complicated than a community of practice, but more coherent than what can be conceptualised under the terms constellation or landscape of practice.

3.3 Phase Three: Learning in Landscapes of Practice

This section focuses on the development of the concepts brought together in *Learning in Landscapes of Practice* and identifies where some of these ideas are elaborations of previous concepts.

Phase three of communities of practice theory centres around the theoretical developments of social learning theory culminating in the edited volume *Learning in Landscapes of Practice* (Wenger-Trayner et al., 2015). This phase was inspired by “questions about practice-based professional learning” (Wenger-Trayner et al., 2015, p. 151). The framework begins with the idea that a “body of knowledge” is seen “as a community of people who contribute to the continued

vitality, application, and evolution of the practice” (Wenger-Trayner & Wenger-Trayner, 2015, p. 13) in contrast to what is held in volumes of books. The body of knowledge described in this way is described as a “landscape of practice” (p. 15). Nordberg (2015) provides a clear definition of knowledge, represented as the starting point for the unpacking of phase three of the communities of practice framework: “Knowledge is created and learning takes place through the interactions of people working at the boundaries, where the disciplines intersect and practitioners meet” (p. 361). The idea of a “complex social landscape” was introduced by Wenger (1998) as being comprised of “shared practices, boundaries, peripheries, overlaps, connections, and encounters” (p. 118). Wenger (1998) also qualified that “First, texture of the continuities and discontinuities of this landscape is defined by practice, not by institutional affiliation; second, the landscape so defined is a weaving of both boundaries and peripheries” (p. 118).

The idea of a shared “social landscape of practice” (p. 118) was already seeded in Wenger’s (1998) earlier work in contextualising the way “communities of practice differentiate themselves and also interlock with each other” (p. 118). Further to this, “the landscape of practice is an emergent structure in which learning constantly creates localities that reconfigure geography” (p. 131). The concept of “knowledgeability in landscapes of practice” was presented in a lecture by Wenger in 2010. He described the individual’s journey within and across communities:

Identity is a trajectory. Over time, it reflects our journeying within some communities as well as transitions across communities. It incorporates the past and the future into the experience of the present. Over time it accumulates memories, competencies, key formative events, stories, and relationships to people and places. It also provides

directions, aspirations, and projected images of oneself that guide the shaping of the trajectory going forward. (Wenger, 2010a, p. 185)

This is broader than the original notion in the 1998 text, focusing on the individual's trajectory into a single community of practice, to across multiple communities of practice over time. A complex landscape of practice includes professional bodies, regulatory bodies, research disciplines, workplaces and service recipients (Wenger, 2010b). The key shift in the third phase is “that it transcends the dominant understanding of taking the person's institutional affiliation as the point of departure when analysing participation and learning in practice” (Nielsen, 2015, pp. 415–416). In this latest development, the perspective changes, as described by Wenger, as a “figure/ground switch” (Omidvar & Kislov, 2014, p. 269) from discussion of competence in a single community of practice to a greater focus of the learning trajectory of the individual moving across and intersecting with communities of practice within the landscape (Wenger-Trayner et al., 2015).

Within the “landscape of practice” it is not possible to “be competent in all the practices” but “we can still be knowledgeable about them, their relevance to our practice, and thus our location in the broader landscape” (Wenger-Trayner & Wenger-Trayner, 2015, p. 19). Knowledgeability then “manifests in a person's relations to a multiplicity of practices across the landscape” (p. 13). “Knowledgeability is a learning relationship with respect to communities where you may not have a relationship of membership” (Wenger-Trayner, 7 May 2016, personal communication). Practice and identity are described as the “distinct carriers” of knowledgeability. In phase two of communities of practice theory, practice and identity were key to an individual's trajectory in a community of practice and the importance of this has been carried through to phase three. The trajectory of a person and their ability to engage in communities of practice across

landscapes still rely on the practice and identity through engagement with communities of practice. Knowledgeability can be thought of as the “modulation of identification”. The criterion for a temporary sojourn with some communities of practice in which we engage does not require full competence with that community, but knowledgeability. In a sense, knowledgeability is being able to relate with and make connections across a landscape.

In the third phase, the idea of identity is recognised as important to 21st century learning and knowledgeability as the social defined competence. This modulation of identity combines experience and competence. Two current and simultaneous trends, as viewed from the perspective of this social learning theory, are vertical and horizontal power. The vertical accountability involves hierarchy, institutional accountability, evidenced-based prescription, codification and regulation, and standards of qualification. Horizontal accountability is communities and networks, peer-to-peer learning, engagement and creativity, and individual identity (Wenger, 2010b). The social learning theory is developed further by the redefinition of learning “as a realignment of competence and experience, whichever leads the other” (Wenger, 2010b, Slide 19).

The final section of *Learning in Landscapes of Practice* was co-written by the text’s editors. They explained that the “book is not the endpoint of our inquiry” (Wenger-Trayner et al., 2015, p. 152); it is an invitation to a conversation. The researcher in this study accepts this invitation to the conversation and contributes by way of this case study in a complex professional-practice education context.

3.4 Conclusion

In order to consider the processes involved in teacher professional learning, communities of practice theory as a framework offers a vocabulary for considering the social and situated aspects of learning for teachers. A number of issues with the communities of practice framework present challenges for this study; nevertheless, the framework is an appropriate lens for analysis. The use of this framework for analysis in emerging teacher professional learning is limited. This study contributes to the field of research in the analysis of a unique case of a network of schools positioned by a government-funded project as an elearning community tasked with supporting teachers to integrate technology into their curricula using the communities of practice framework.

In the next chapter, the research methodology unfolds through a discussion of the rationale for the design, theoretical framework, methods, approach to analysis of the data and trustworthiness of this study.

Chapter 4 Methodology

This qualitative case study of an elearning community explores teacher professional learning using communities of practice theory as a lens. This chapter provides a description of and rationale for the design of the study, including choice of methodology, ethics, research site, participants, data collection and thematic analysis. The chapter concludes with a consideration of trustworthiness through a discussion of credibility, transferability, dependability and confirmability.

4.1 Research Design

This research was designed to understand the experiences of teachers and coaches engaged in professional learning practices with the common goal of integrating technology into the curriculum in a network of schools. A qualitative approach was appropriate for this purpose to “study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 2005, p. 3). Notwithstanding the false dichotomy of quantitative and qualitative methods being synonymous with research paradigms (Guba, 1981), especially in light of the popularisation of mixed-methods research (Creswell, 2003), this study is broadly qualitative.

In line with developments in theorising research paradigms, the researcher does not take the categories quantitative, qualitative and mixed methods to be research paradigms, as they are more apt descriptors of data collection methods (Creswell, 2003; Guba & Lincoln, 1994). Having stated this, the researcher does accept that a number of generalisations can be made about the

distinction between quantitative and qualitative approaches. A quantitative approach generally applies a methodology of statistical probability sampling of a larger number of cases, whereas a qualitative research study generally explores a small number of purposeful-sampled cases in depth (Patton, 2002; Ritchie, Lewis, & Elam, 2003). The purpose of the quantitative study is to be able to generalise from the sample to a population, making this a distinction in approach and logic from a qualitative approach (Patton, 2002; Ritchie et al., 2003). This is a qualitative research study that involves the exploration of “a set of complex interpretive practices” (Denzin & Lincoln, 2005, p. 6). Kuhn (1970) expressed ground breaking revelations about the nature of research paradigms as a social construct of communities of researchers. Kuhn’s description of paradigm is “the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community” (p. 175). At a macro-level discussion of paradigms, the communities of researchers most resemble a landscape of practice. Within the landscape, there are constellations and smaller communities of practice within research paradigm constructions.

In terms of the main two historical research paradigms, rationalistic and naturalistic, this study is a “naturalistic inquiry” (Guba, 1981). Research paradigms have evolved in terminology such as positivist (instead of rationalistic) and constructivism (instead of naturalistic inquiry) (Guba, 1981; Guba & Lincoln, 1994). The number of research paradigms theorised have continued to multiply over the last three decades (Creswell, 2003) as predicted by Geertz (1985) in reference to “blurred genres” (p. 7). Indeed, multiple-disciplinary perspectives are increasingly infused within paradigms. Guba and Lincoln (1994) presented four main paradigms: positivism, postpositivism, critical theory and constructivism. In 2005 they added the participatory paradigm to this set (Guba & Lincoln, 2005). Within the evolved terminology, this study falls within what was termed the naturalistic paradigm and is now more commonly called the constructivist

paradigm. The aims of the inquiry within a constructivist paradigm are “understanding” and “reconstruction” (Guba & Lincoln, 2005, p. 194). Fitting with the purpose of seeking understanding within a specific context and program, this research is constructed as a case study.

Within this constructivist paradigm, this research was designed as a case study as defined by Simons (2001):

Case study is an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, programme or system in a “real life” context. It is research-based, inclusive of different methods and is evidence-led. The primary purpose is to generate in-depth understanding of a specific topic (as in thesis), programme, policy, institution or system to generate knowledge and/or inform policy development, professional practice and civil or community action. (p. 21)

Here, the “complexity and uniqueness” of the elearning community project was the driver for making this the case under study. Coaches and teachers were selected as participants to represent the “multiple perspectives” referred to by Simons in relation to understanding the project’s enacted community approach to professional learning. Therefore, the “perspective based” unit of analysis for this case study is an elearning community project where insight has been gleaned from a group of teachers and coaches “who share a common experience” (Patton, 2002, p. 231) in working in the context. The defining feature of case study research is “a multiplicity of perspectives” from a specific context (Lewis, 2003, p. 52), especially in this study where a social constructivist paradigm of research has been adopted. While the multiplicity of perspectives can come from multiple data methods, “they may also derive from multiple accounts” (Lewis, 2003, p. 52). Therefore, the design of this study allowed for the crystallisation of participant views and

the identification of contrary cases to represent the multiplicity of perspectives. This also fits with the midlevel analysis of the communities of practice framework and the research questions developed to understand the phenomena surrounding the construct of an elearning community.

The research questions for this study were designed to understand the experiences of teachers and coaches in relation to professional learning integrating technology and to conduct an interpretive analysis, within the context of one specific project “case” and from the perspective of the communities of practice framework discussed in chapter three. The research questions are:

1. How does forming a network of schools affect teacher and coach experiences of teacher professional learning in the integration of technology into the curriculum?
2. How do teachers and coaches negotiate the implementation of large-scale technology initiatives of laptops and a learning management system?
3. How do teachers and coaches working to integrate technology into the curriculum experience professional learning within a network context?
4. What factors support the work of coaches in their role to assist teachers to integrate technology into their curriculum?

As discussed extensively in chapter three, communities of practice theory has been selected as a framework for interpreting the phenomena because the social and situated aspects of learning are important to this study of teacher learning. For the purpose of this study, the communities of practice framework refers primarily to its usage in Wenger (1998), which is part of broader social learning theory.

Communities of practice theory was chosen to inform the “interpretivist approach” (Arikan, 2005) used in this study. The interpretive bricoleur best resonates with the role of the researcher in this study, who “produces a bricolage; that is, a pieced-together set of representations that are fitted to the specifics of a complex situation” (Denzin & Lincoln, 2005, p. 4). Selection of communities of practice theory as a lens for interpretive analysis fits with the ontological and epistemological views of the study. Communities of practice theory originates from situated learning theory (Lave & Wenger, 1991). Borko (2004) confirmed that “research in a situative tradition allows for multiple conceptual perspective and multiple units of analysis” (p. 4) and is therefore apt for exploring the situated perspective of teacher professional learning (Borko, 2004). Communities of practice, as a theory of learning, fits with the “subjectivist” (Denzin & Lincoln, 2005, p. 24) epistemological framework of this study. In this sense, the epistemological stance of this study aligns with the theoretical framework chosen for interpreting its data. The interpretive approach is congruous with the constructivist paradigm (Harris-Hart, 2002).

Social constructivism adds the social element to the constructivist view (Vygotsky, 1978). Constructionism (different to but inspired by constructivism) was popularised in the field of educational technology through the work of Seymour Papert and his logo programming software for children in the 1980s (Papert & Harel, 1991). Papert worked closely with Piaget, whom is considered one of the pioneers of constructivism. Social constructivism is also used interchangeably with social constructionism (Andrews, 2012). Social constructionism (and social constructivism) has also been attributed to the work of Berger and Luckman (1991). Further to this, communities of practice has been described as a social constructivist theory originating in the work of Vygotsky (Cochrane, 2011). This is because, as a framework, it situates the learning in the context of the work and embeds the social nature of learning in its theorisation. This has also

led to communities of practice theory being incorporated into sociocultural frameworks (Jaipal, 2007). Sociocultural theory is also influenced by Vygotsky (1978). The social constructivist paradigm has also influenced this study because it was the prevailing pedagogical driver in the form of student-centred learning in policy and curriculum at the time of the project.

Wenger (1998) explained that “as an analytical tool, communities of practice is a midlevel category” (p. 124). This is because “it is neither a specific, narrowly defined activity or interaction nor a broadly defined aggregate that is abstractly historical and social” (p. 125). The research questions and subsequent instrument of data collection, the semi-structured interview questions, reflect a level of analysis that is neither micro or macro level, but meso (or mid) level. It is appropriate for this study to be positioned at the meso or midlevel analysis of the processes and interactions involved with a group of schools working together, as well as the teachers and coaches. The level of analysis is situated between the micro level, “a specific interaction” (p. 125), and the other end of the spectrum of viewing groups from a macro level, such as “a nation, a culture, a city, or a corporation as one community of practice ... [that] would miss crucial discontinuities among various localities where relevant learning takes place” (p. 125). In this way, communities of practice theory is seen as an appropriate interpretive theory for the level of analysis for this study.

Used as an interpretive theory in this way, communities of practice theory is consistent with the “relativist” (Denzin & Lincoln, 2005, p. 24) ontology that reality is formed of multiple social and cultural constructs and, correspondingly, the epistemology that knowledge is an ever-changing landscape constructed contextually through social participation for this study. According to Kukla (2000), “epistemic relativism” entails that “there is no absolute warrant for any belief – that rational warrant makes sense only relative to a culture, or an individual, or a

paradigm” (p. 4). However, constructivism is in a sense post-epistemological (von Glasserfeld, 1991) and an emancipatory (Mezirow, 1996) view further facilitates communities of practice theorisation as part of the inductive interpretation of phenomena. Packer and Goicoechea (2000) reconciled the differing ontologies of sociocultural and constructivist theories of learning because “acquiring knowledge and expertise always entails participation in relationship and community and transformation both of the person and of the social world” (p. 239).

An overview of the research design is presented in Figure 15.

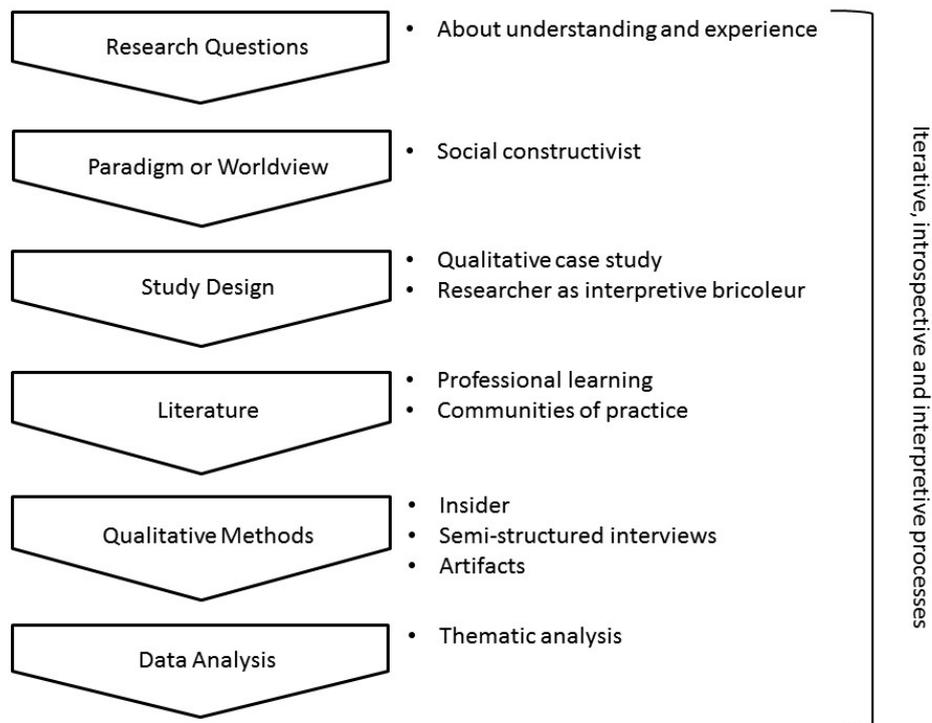


Figure 15. Research Methodology Map

In this section, the appropriateness of the research design of this case study situated in the interpretivist paradigm and the theoretical framework in relation to the purpose of the study has been established.

4.2 Ethics and Permission to Conduct the Study

The Monash University Standing Committee on Ethics in Research Involving Humans (SCERH) granted ethics approval for this study on 30 April 2009. Terms of approval included obtaining a permission letter from the Education Department of Victoria. This was granted on 2 July 2009 with the condition that permission was obtained from the principal of each of the seven schools (see Appendix A. Letter Requesting Permission From Principals and Appendix B. Principal Permission Form). Each of the seven principals granted permission. The project coordinator was requested to invite the Project Team members to participate in the study (see Appendix C) and an invitational email for staff was included (see Appendix D). The explanatory statement (see Appendix E) informed consent form (Appendix F) and the semi-structured interview guide (Appendix G) to send to the coaches was also approved by the ethics committee. The original concept of the investigation was scoped at the ethics proposal stage to take into account the considerations raised by the project coordinator about the workload of teachers and the imposition endless surveys and research might create.

The ethical issue of privacy in a small education community was raised by Christians (2005), who explained “watertight confidentiality has proved to be impossible” (p. 145). Explanatory statements offered individual de-identification of the responses, with the caveat that participants understood that their “participation in the study and identification in the final report might be possible in the light of the small and coherent nature of the organisation(s)” (see Appendix E). Based on the role and profile of the researcher and distinct nature of the cluster of schools and their profiles, it was not possible to promise complete anonymity for the participants in the cluster. In light of the caution by Christians (2005), it was decided not to include a list of participants and their respective schools due to the increased risk of identification of participants

who did not wish to be identified. Naming some participants might make identification by others easier through deduction. This is an example of the “ethics of care” that a practitioner researcher needs to take into account when living the realities of work-based research with institutional frames of ethics that may not “safeguard these personal and moral relations to others within a research project” (Gibbs & Costley, 2006, p. 239). Pseudonyms are used throughout this thesis for the names of schools and participants to reduce the possibility of identification. The pseudonym used for the learning management system is ApprendWeb in this study.

4.3 A Case Study: The Setting and Unit of Analysis of the Study

A case study “concentrates on experiential knowledge of the case and close attention to the influence of its social, political and other contexts” (Stake, 2005, p. 444). This research is a case study of an elearning community. It is a case study in the sense of the “process of inquiry and about the case and the product of the inquiry” (Stake, 2005, p. 444). While the case for this study is an elearning community comprised of seven schools, this research sought to understand the experiences of teachers and coaches involved in professional learning and practice of integrating technology in the curriculum in a community context. This study began from a general question around “What works in a learning community and why?” with the particular case of the elearning community I was working for in mind. The inquiry into this case study began with observation and reflection in my work context. The “setting” (Patton, 2002, p. 280) is then seven schools located on the rural–urban fringe of Melbourne, Australia, within 35 kilometres distance of each other.

The unit of analysis for this case study is an elearning community project comprising seven schools (see Figure 16). In considering “identity in social terms”, according to Wenger

(1998) it is erroneous to relegate the “unit of analysis” to the “community or the person”; therefore, this study focuses on the “interplay” of the duality, not the classification (Wenger, 1998, p. 146). This study also recognises that in the context described, the organisational boundaries and the communities of practice boundaries are necessarily interdependent and blurred. The objective is not to provide clear delineations between the multiple communities of practice in the setting, but to focus on the interplay between the person and community, as Wenger described.

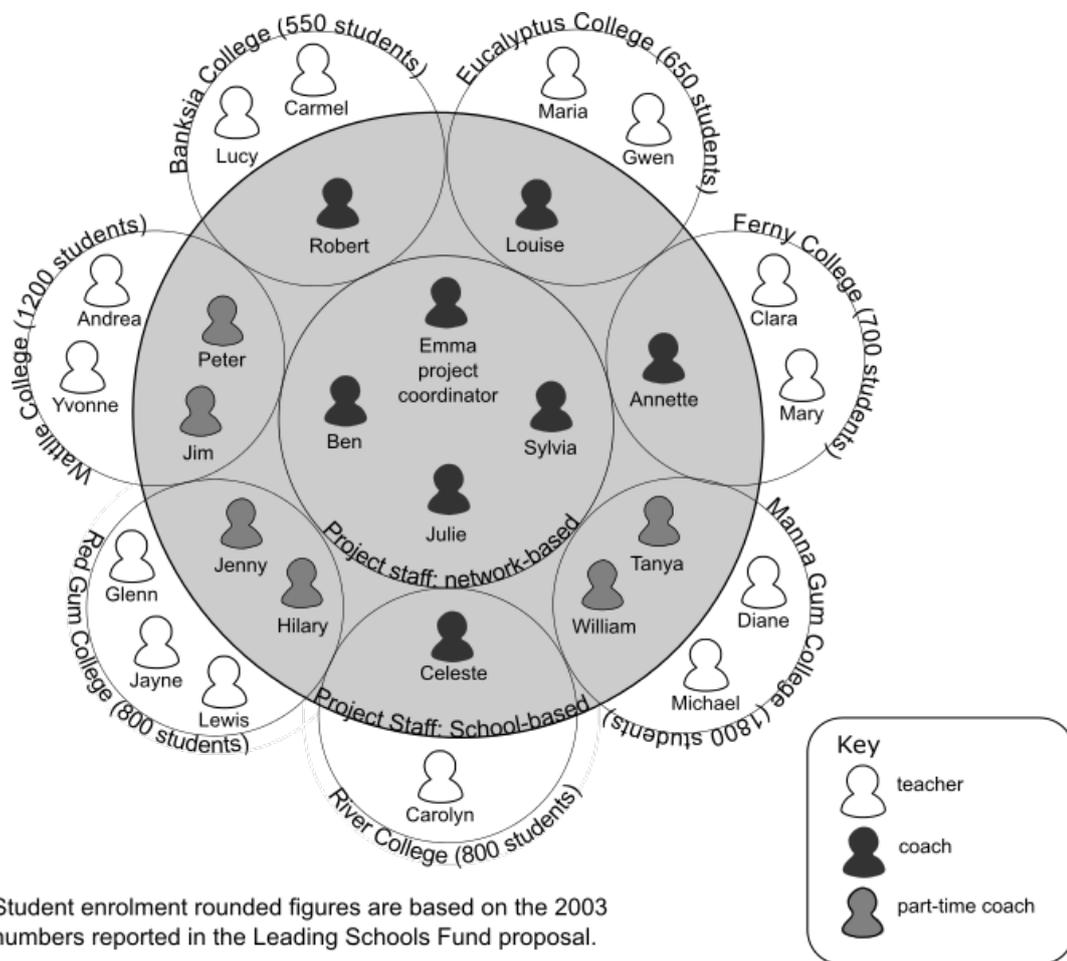


Figure 16. Unit of Analysis: An eLearning Community Project Across Seven Schools

When the schools started out on their elearning journey, they all had very low proportions of their budget allocated to ICT professional learning (DET, 2004, p. 7). The main type of professional learning that staff engaged in was face-to-face workshops, with only two of the seven schools engaging in a limited amount of online professional learning (DET, 2004, p. 7). The schools had different starting points and had different resources available to them based on their request in the funding applications for the project. All schools received laptops for year seven and eight students, and access to a learning management system, professional learning workshops and in-school coaching support through the project funding. The schools jointly offered a vocational education and training (VET) program and had a common timetable in place for students to facilitate the cooperative offering for those choosing this pathway (DET, 2004, p. 3). Other than the joint VET program, the schools operated as separate entities.

The following descriptions of the schools (pseudonyms used) are based on researcher observation, interview data or as cited from other sources. Approximate ranges of student enrolment numbers have been included in Figure 16. Both Banksia College and River College were rural schools surrounded by small family agricultural businesses. Banksia College was the furthest from the city, had the lowest overall student enrolment but the highest Indigenous enrolment (6% in 2008) of the seven schools (ACARA, 2015). River College struggled with technical support. Eucalyptus College initially had network issues so that the school had to significantly invest unanticipated funds for infrastructure. The buildings were structured with classroom accessible from long hall ways and making it easy to move laptops around except for a few split levels. Manna Gum College was a large school with a large technical support department. Laptop trolleys were allocated to certain areas due to the school having many buildings with varying degrees of difficulty to move trolleys between. Wattle College was a large

multi-campus school that was already using a learning management system prior to the project. Ferny College had a strong technical department. Ferny College was built on a flat level block in a rectangle shape surrounding concreted playgrounds making it accessible for moving laptop trollies to different classrooms around the school. Red Gum College implemented an Essential Learning Framework (ELF) program for year seven coinciding with the implementation of laptops at year seven. The leadership at Red Gum College developed a structured way for the coaches to work with their teachers.

The total number of participants in the study was 28. Of the 28 participants, half were teachers and half were employed by the project to work as school-based coaches or network-based coaches; the project coordinator was also included in this group. At least one school-based coach was interviewed from each school. Some schools elected to hire two or three coaches at a part-time fraction instead of one full-time coach. This is the reason for the discrepancy in that there were more coaches than the number indicated in the funding agreement. Only six of the 14 project based staff were employed from outside the seven schools and the others had been employed as teachers prior to their network-based or school-based coaching role. During the semi-structured interviews, project staff and teachers from the project had the opportunity to speak about their collaboration with others, the learning management system, the laptop program, professional development, curriculum and pedagogy. Participants are represented in Figure 16 in relation to their base school or position across the network at the centre of the project schools. Further participant demographics are discussed in the next section.

This section has described the setting of seven schools that came together as an elearning community that has been selected as the case for this study into teacher professional learning in

integrating technology. The next section details participant selection, recruitment processes and demographics.

4.4 Participant Selection, Recruitment and Demographics

In this section, the participant selection and recruitment process, which consisted of two phases, is described. Demographics of the participants are illustrated with tables and narratives.

Two specific, purposeful sampling methods used in this study were “criterion” and “snowball”, to “select information-rich cases strategically and purposefully” (Patton, 2002, p. 243). Preissle and LeCompte (1984) preferred the term criterion-based sampling to the term purposive sampling to describe non-random sampling because they argue all sampling is purposive. This study has chosen to use the term purposeful sampling and purposive sampling interchangeably to describe non-random sampling categories because Patton (2002) refers to purposeful sampling as an umbrella category for the two methods used in this study and “purposive is the term most commonly used in the literature” (Lewis, 2003, p. 78). Firstly, the criterion sampling method was used to invite anyone who had been employed within the project team as a coordinator, network-based coach or school-based coach to participate. The project coordinator was emailed a request to invite the Project Team members to participate in the study (see Appendix C), along with an invitation (see Appendix D), explanatory statement (see Appendix E) and informed consent form (Appendix F) to send to the coaches. Secondly, snowball sampling was used to “identify cases of interest from sampling people who know people”, resulting in cases that are “information rich” (Patton, 2002, p. 243). In this study, snowball sampling was used to gain access to teacher participants whom the coaches had worked closely with. Coaches were asked to invite two or more teachers with whom they had worked in the

project and were requested to forward the explanatory statement and consent form. The purposeful sampling stages are represented in Figure 17.

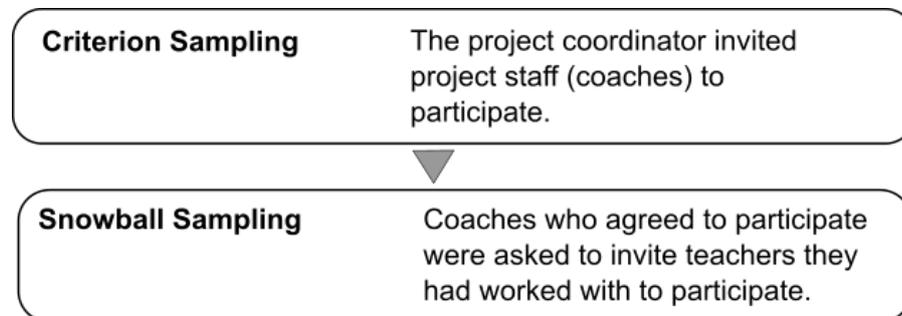


Figure 17. Purposeful Sampling: Criterion and Snowball Methods Used in This Study

Purposeful sampling methods used may be perceived as creating a potential bias issue. The original reasoning for the site selection for the case study as explained in the introduction was as intuition that the community approach to professional learning in this setting was empowering teachers. The initial observation that the approach of the community was achieving its ends could predicably produce positive accounts. The snowball sampling method that relied on referrals employed in this study could also be perceived as introducing a sampling bias in to the study (Lewis, 2003). The project staff might have selected participants with whom they had more harmonious relationship rather than those that were problematic. While this stands to be a possibility, it was more important for this study to select participants that could provide “information rich” (Patton, 2002, p. 243) accounts of the professional learning and the community. The non-random sample “is not intended to be statistically representative” (Ritchie et al., 2003, p. 78). A random sample of teachers would not have increased the generalisability of this study and may not have produced the richest data about core community dynamics. The demographics of participants is included here in **Error! Not a valid bookmark self-reference.** shows the number of participants from each of the schools and the project team.

Table 4. Participants by School and Job Role

| | Teachers | Full-time Coach | Part-time Coach | Total |
|--|----------|-----------------|-----------------|-------|
| Manna Gum College | 2 | | 2 | 4 |
| Wattle College | 2 | | 2 | 4 |
| Banksia College | 2 | 1 | | 3 |
| Melba College | 2 | 1 | | 3 |
| Red Gum College | 3 | | 2 | 5 |
| Ferny College | 2 | 1 | | 3 |
| River College | 1 | 1 | | 2 |
| Project staff only – project coordinator and network-based coaches | | 4 | | 4 |
| | 14 | 8 | 6 | 28 |

Table 5. Teacher Demographics

| Pseudonym | Sex | School | Years Teaching | Teaching Area | Length of Interview |
|-----------|--------|--------------------|----------------|---|---------------------|
| Andrea | Female | Wattle College | 1–10 | Maths, science, IT | 34:42 |
| Carmel | Female | Banksia College | 11–20 | Science | 16:17 |
| Carolyn | Female | River College | 31–40 | Humanities, English | 21:36 |
| Clara | Female | Ferny College | 11–20 | Maths, science | 15:14 |
| Diane | Female | Manna Gum College | 31–40 | Humanities, languages other than English (LOTE): French | 19:34 |
| Glenn | Male | Red Gum College | 1–10 | IT, music | 15:00 |
| Gwen | Female | Eucalyptus College | 11–20 | Library, English, humanities | 22:28 |
| Jayne | Female | Red Gum College | 11–20 | Science, maths | 21:31 |
| Lewis | Male | Red Gum College | 11–20 | Literature, English, humanities | 19:47 |
| Lucy | Female | Banksia College | 11–20 | English, humanities | 22:32 |
| Maria | Female | Eucalyptus College | 11–20 | English, humanities | 12:12 |
| Mary | Female | Ferny College | 21–30 | English, humanities | 14:56 |
| Michael | Male | Manna Gum College | 11–20 | Physical education, outdoor education | 19:42 |
| Yvonne | Female | Wattle College | 1–10 | Humanities, English | 19:00 |

In Table 5 the demographic details for the 14 teachers are provided. The researcher knew 10 of the 14 teacher participants through her work in the elearning community project. The participant teachers who were unknown to the researcher prior to interview were Carmel, Michael, Diane and Maria. Table 6 **Error! Not a valid bookmark self-reference.** presents the project team demographics.

Table 6. Project Team Demographics

| Pseudonym | Sex | School | Role | Years Teaching | Teaching Area | Length of Interview |
|-----------|--------|--------------------|--------------------------------|----------------|---|---------------------|
| Annette | Female | Ferny College | School-based coach | 21–30 | Maths, IT | 19:54 |
| Ben | Male | Project Team | Network-based coach | 11–20 | Science, maths, IT | 37:39 |
| Celeste | Female | River College | School-based coach | 21–30 | Art, technology | 34:34 |
| Emma | Female | Project Team | Project coordinator | 31–40 | Library, English, humanities, media, IT | 25:53 |
| Hilary | Female | Red Gum College | School-based coach | 11–20 | Maths, IT | 27:06 |
| Jenny | Female | Red Gum College | School-based coach | 1–10 | Primary generalist | 27:34 |
| Jim | Male | Wattle College | School-based coach and teacher | 21–30 | Science, IT, maths | 27:29 |
| Julie | Female | Project Team | Network-based coach | 11–20 | Music, photography, visual arts, IT | 25:05 |
| Louise | Female | Eucalyptus College | School-based coach | 16–20 | Maths, science, IT, psychology | 23:56 |
| Peter | Male | Wattle College | School-based coach and teacher | 21–30 | Art, media, IT, graphics, woodwork | 19:50 |
| Robert | Male | Banksia College | School-based coach | 21–30 | IT, photography, media | 18:57 |
| Sylvia | Female | Project Team | Network-based coach | 11–20 | Art, photography | 24:10 |
| Tanya | Female | Manna Gum College | School-based coach and teacher | 1–10 | English, psychology | 19:34 |
| William | Male | Manna Gum College | School-based coach and teacher | 11–20 | Humanities, technology | 27:30 |

The researcher knew all the project staff and school-based coaches. Six of the 14 project team members had not worked in any of the seven project schools prior to their appointment to the project team. They were: Hilary, Jenny, Celeste, Robert, Emma and Ben. All other coaches were appointed from within the seven-school group.

This section has presented the details about participant selection, recruitment and demographics. In the subsection which follows the detailed teacher and project team participants' profiles are presented to share with the reader background information that will be useful in understanding the dynamics of participants in the elearning community.

4.4.1 Teacher participant profiles.

The individual profiles of the teachers with more detail than is including in the discussion and findings are presented here. Note: pseudonyms are used

Andrea: Teacher, Wattle College

Andrea had been teaching for six years at the time of the interview. She had been primarily teaching maths and science but had also taught ICT. Prior to teaching she worked in a science laboratory and then went on to work as a lab technician in schools for about six years. Andrea had worked as a lab technician at Manna Gum College prior to becoming a teacher. She also held the positions of timetabler and head of science during her time at Wattle College. After the project she went on to teach at a government school not involved with the project. Andrea was involved in the elearning community coordinated, Country to City Water Project.

Carmel: Teacher, Banksia College

Carmel had been teaching for 15 years. She had taught 11 of those years at Banksia College where she was the year eight manager and a teacher of science, year nine integrated studies and year 11 biology.

Carolyn: Teacher, River College

Carolyn had been teaching for around 35 years. She began as a primary teacher before teaching English, humanities and psychology in secondary schools. During the project, she was head of English and literacy, and a classroom teacher. At the time of the interview Carolyn was the curriculum coordinator. Carolyn was also on the committee in the school for elearning and an integration teacher. After the project, Carolyn became a teaching and learning literacy coach.

Clara: Teacher, Ferny College

Clara had been teaching maths and science for 24 years. At the time of the interview, she was a teacher at Ferny College and held the leadership roles of roles of daily organiser and maths coordinator. Clara primarily taught maths.

Diane: Teacher, Manna Gum College

At the time of the interview Diane was a history and French (Languages other than English teacher, LOTE) teacher at Manna Gum College. She had been teaching for over 30 years. She was also the assistant accelerated learning program coordinator. In recent years, she had been teaching straight LOTE curriculum.

Glenn: Teacher, Red Gum College

Glenn began his teaching career as an instrumental music teacher. At the time of the interview, Glenn had been teaching for six years and was the ICT leader at Red Gum College.

Gwen: Teacher, Melba College

Gwen had more than 20 years teaching experience. At the time of the interview she was a teacher librarian who also taught English and humanities. She had held the role of curriculum coordinator for five years.

Jayne: Teacher, Red Gum College

Jayne was the science coordinator at Red Gum College at the time of the interview. She had been teaching for over 20 years; 10 years overseas, spent a few years as a science technician and had been teaching for about 6 years at Red Gum College. She taught science and maths and VCE (Victorian Certificate of Education) biology.

Lewis: Teacher, Red Gum College

Lewis had taught for 11 years at the time of interview and was currently a VCE literature teacher at Red Gum College for Years' 11 and 12 students. He also taught English and humanities in the accelerated program for year seven and ten. Lewis was set to become head of English in the year following the interview.

Lucy: Teacher, Banksia College

At the time of interview, Lucy was a teacher at Banksia College. She had 15 years teaching experience. She taught English and history. The researcher worked with Lucy on a digital story curriculum project.

Maria: Teacher, Melba College

Maria had been teaching English and humanities for twenty years. At the time of the interview (and during the project) she was working at Melba College. Maria taught year seven and was involved in the laptop program.

Mary: Teacher, Ferny College

Mary had been teaching for over 35 years. She taught English, history, and geography at Ferny College. She was the head of humanities and the leader of an accelerated learning program.

Michael: Teacher, Manna Gum College

Michael was the coordinator for the advanced program for year nine students doing the Duke of Edinburgh Award. He also taught and coordinated outdoor education for year ten and VCE, He also taught physical education. He had been teaching 15 years and had also spent years abroad working in the outdoor recreation industry.

Yvonne: Teacher, Wattle College

Yvonne was teaching humanities and English and held the role year seven coordinator at Wattle College. She had taught for 8 years. Yvonne loved being part of the year seven laptop program. During the time of the project Yvonne had held a position as elearning coordinator.

4.4.2 Project team participant profiles.

Only six of the 14 project staff were new to the community of schools when appointed to the project. All other coaches were appointed from within the seven-school group. The individual profiles of the coaches reveal diversity in experience and expertise, which was beneficial in the professional learning process.

Anne: Coach, Melba College

Anne had taught maths, science, IT, and psychology for between 16 and 20 years. She was teaching at Melba College prior to being hired as a coach within her school. Anne also was responsible for the school website and generally supported staff with all things computer related even those normally in the realm of computer technicians. She resumed her teaching there after the project.

Annette: Coach, Ferny College

Anne was a maths, ICT and science teacher who had been teaching for 22 years. Anne became the coach in her school where she had been teaching. Anne had been working in industry as a VET nurse and had also worked in immunology in a hospital prior to teaching. Anne also had many years teaching experience in a different school prior to working at Ferny College. Anne continued coaching after the project but in a school outside of the community network.

Ben: Coach, Project Team

At the time of the interview Ben was ICT Leader at Ferny College. Ben had been a network-based coach in the project for six months prior to this appointment. Ben has 19 years' experience teaching physics, science, maths, and information technology. Prior to the project, Ben worked in an education science centre.

Celeste: Coach, River College

Celeste had worked in education for 24 years, although not always full time. Originally Celeste trained as an art teacher, but had also taught technology. She liked to coach teachers across all domains. She had worked in primary schools and as a teacher in the Technical and Further Education (TAFE) sector prior to the project. Celeste was a coach at River College during the project. After the project, Celeste continued as a coach in her school under a new program with a focus on literacy.

Emma: Project Leader, Project Team

Emma had a background in teacher librarianship and had taught English, humanities, media and IT for over 30 years. Prior to the project, she was a ICT leader at a government school outside the project schools. She held the position of project coordinator during the project which was at an assistant principal level. Due to her role in the project requiring negotiation with principals, she was affectionately referred to at times by project staff as our “fearless leader”. Her overall approach to the running the project could be described as a “top-down” and “bottom-up” approach (Fullan, 1994, p. 7).

Hilary: Coach and Teacher, Red Gum College

Hilary was a part-time eLearning Coach in Red Gum College. She worked as a teacher in Technical and Further Education (TAFE) for about seven or eight years as a mechanical engineer before she became a teacher. She was completing her education diploma whilst helping other teachers at the same time. After the project, Hilary became employed as a maths and information technology teacher at an independent school.

Jenny: Coach, Red Gum College

Jenny was a primary teacher for about 5 years prior to becoming a part-time coach alongside Hilary at Red Gum College. She was the one-day per week project coordinator for the elearning community project's partial extension in 2008. No-other positions continued under project funds in 2008.

Jessica: Coach and Teacher, Manna Gum College

Jessica taught English and psychology. Jessica began coaching teachers part-time (and continued teaching part-time) in her second year of teaching and participated in the Intel Teach to the Future course in her first year of teaching in 2004.

Jim: Coach and Teacher, Wattle College

Jim had more than 27 years teaching experience; mostly at Wattle College. He taught science, information technology, maths and senior biology. He was the ICT leader and data manager. He was previously the head of maths, science and information technology.

Julie: Network-based Coach, Red Gum College – Ferny College

Julie was originally a classroom and instrumental music specialist. She also had a background in information technology. Her teaching career had been ongoing for 18 years. Prior to becoming a network-based coach in 2006 for the project, she was head of art and director of music. Julie also assumed the acting project coordinator role for six months in 2007.

Peter: Coach and Teacher, Wattle College

Peter was employed as a part-time coach at Wattle College where he had been teaching full-time prior to the project. He had been teaching for 22 years and had two years non-teaching experience as a train driver and conductor. He taught art, media studies, graphics, woodwork, and ICT. He resumed his teaching role after the project focusing on art, visual art, and general computing.

Robert: Coach, Banksia College

Robert taught information technology, photography and media subjects. He had been a classroom teacher for 25 years. Aside from that, he had 20 years non-teaching experience running his own business.

Sylvia: Network-based coach

Sylvia at the time of the study was a network-based coach. She had 11 years teaching experience in Art and her speciality is Photography. Sylvia began the project in the same school she had been teaching but due to inter-office politics, she moved schools early in the project.

William: Teacher and Coach, Manna Gum College

William has been teaching more than 20 years. He had also spent some time in Japan as an English teacher. William became a part-time coach in the school he had been teaching at and resumed teaching full time at this school after the project. He taught mostly humanities and sometimes technology.

Section 4.4 has described participant selection, recruitment and demographics. The two subsections have detailed the participant profiles. The next section describes the data collection and analysis processes.

4.5 Data Collection and Analysis

The main method used for “primary source” (Bickman & Rog, 2009, p. 19) data collection in this study was a single semi-structured interview with 28 participants. The purpose of using interviews “to enter into the other’s perspective” (Patton, 2002, p. 341) was appropriate to gain an in-depth understanding of the participants’ thoughts and opinions relating to their experiences during the elearning community project. The strong intention to reflect the voices of the coaches and teachers to reveal their perspectives on their experience working together in the context of the elearning project led to this decision to select interviews as the appropriate method, because these interpretations are “not observable” (Merriam, 2009, p. 88). The specific choice to use a semi-structured interview technique allowed collection of responses on the same topics from all participants but allowed flexibility for “the researcher to respond to issues at hand, to the emerging worldviews of the respondent, and to new ideas on the topic” (Merriam, 2009, p. 90). The researcher in this study was necessarily an “insider” (Thomson & Gunter, 2011) because she worked for the elearning community project. However, the focus on the researcher’s participation

is minimised for ethical reasons involved with ensuring that participants in the study were clear about what data is being used and why. For this reason, this study was designed to focus on the data collected via semi-structured interviews after the project and employment of the researcher were finished. Other sources were used where permission was given by participants at interview. These will be outlined in this section.

Interviews were conducted over Skype where possible (17 of the 28) to allow the call to be video-recorded. One face-to-face interview was video-recorded using a laptop and two were audio-recorded to a phone. Nine interviews were telephone calls on speaker that were audio-recorded using a laptop. Interviews were conducted in a variety of locations, generally the current school of the participant. In one case, the interview was recorded in a participant's home and in another at a coffee shop. Interviews with teachers lasted between 12 minutes 12 seconds and 34 minutes 42 seconds. Interviews with project staff lasted between 18 minutes 57 seconds and 37 minutes 39 seconds. The average interview time with teacher participants was 19 minutes 36 seconds and for project staff the average time was 24 minutes 56 seconds. The total interview recordings for teacher participants was 4 hours 34 minutes and for project staff this was 5 hours 48 minutes. A total of 10 hours 22 minutes were recorded. The 28 interviews resulted in 89,809 words of transcripts.

Interviews went for approximately 20 minutes' duration with each participant. Interviews were scheduled at times and locations convenient to the participants. The interviews mostly took place remotely between the school the researcher was working in at the time and the school the participant was working in at the time. Interviews were not necessarily held in a private room. The issue of teachers' lack of private offices was noted by Schlager et al. (2002) who noted that in the online Tapped In community the "offices" became one of the most popular features of the

network (p. 148). However, this study did not address this issue of lack of a completely private space for interviews and this may have impacted the responses given by participants. The lack of a private space to conduct interviews did mean that there were some minor interruptions, such as someone walking into the room and then leaving again during the interviews, and so this did affect participants' willingness to speak freely. The recordings of the interviews, despite the lack of a completely quiet place were of suitable quality for accurate transcription.

The interviews were conducted for the most part via Skype with video where available. It was useful to have the video when relistening to the recordings to clarify participant meaning when non-verbal cues were given; such as scratching the head which allowed interpretations like the participant was trying to think of something to say and had exhausted their dialogue in that question. If video was not available, then only audio was recorded. Where the participant preferred to use the telephone this was the method used. These calls were recorded using audacity on my computer. There may be some issue in having video available for some but not all interviews in that the non-verbal cues could be interpreted whereas in the audio recordings the researcher had to rely on what was said and tone only. The recordings (video or audio) were transcribed verbatim and de-identified. These transcriptions formed the basis of primary source data for analysis. Most of the transcription was outsourced to a professional company and this was funded by Monash University. The quotations used have been orthographically edited, "with repetitions, fillers and backchannellings edited out, and punctuation inserted" to support my own interpretation of the sense of the quotation (Tusting, 2012, p. 137, note 6).

The semi-structured interview guide has been included in Appendix G. The first set of questions are demographic in nature and not numbered. The demographics included gender, school, job/position at the participant's school or within the elearning community project and

movements between these as relevant, years teaching or employment background and subjects taught. The first three numbered questions were structured to get a sense of who the participant collaborated with. The next three questions were related to the two main technology initiatives the learning management system and laptops as well as asking about technical aspects or technical problems in using technology. The seventh question related to professional development. The next two questions related to perceived changes in curriculum and teaching/coaching (depending on role of person). As most coaches were qualified teachers (some had come from TAFE settings) the question was still asked in the same way (as in have you changed the way you teach or coach). Teachers were not asked if they changed the way they coached. The next questions, 10 and 11 asked about benefits of the project and how it could have been more effective; “leaving the response open to the participant’s experience and conceptions” (Charmaz, 2006, p. 33). The 12th question asked how the participant would explain the project to another teacher. This was to get a sense of the participant would sum up their experience and capture their understanding of the vision of the project or what they thought it did achieve depending on the interpretation and perspective of the participant.

The final questions included the opportunity for participants to add further information generally as well as to revisit the main topics “intentionally” to draw out further explanation (Charmaz, 2006, p. 32). The semi-structured interview approach also allowed for “follow-up ‘probes’ in response to the interviewee’s descriptions and accounts” (Roulston, 2010, p. 14). The last questions were asked to draw out any further explanation the participant may wish to offer, artifacts to illustrate their experience and finally to revisit the main topics.

Aside from the interview data, a number of artifacts were included for analysis where participants provided permission for their use at interview. For example, the project coordinator

gave permission to use the project proposal and reports about the project that were prepared for the region. Permission to use the Schoolyard Blitz materials and student work was given by the teacher participant. I also referred to Powerpoint slides and notes I had made for a keynote speech for the project's conference jointly delivered by the project coordinator and network-based coaches. The use of these artifacts was useful to support an understanding of the context and the interpretation.

This study approached the thematic analysis of data by both inductive and theoretic framing (Braun & Clarke, 2006). The qualitative researcher “collects open-ended, emerging data with the primary intent of developing themes from the data” (Creswell, 2003, p. 18). In this study, the thematic analysis has been taken further to also interpret the data in relation to the research questions and theoretical framing (Boyatzis, 1998; Braun & Clarke, 2006). This combines the bottom-up data-driven approach and top-down theory-driven approach. In line with the constructivist approach to research, this study was concerned with theorising the “sociocultural contexts, and structural conditions, that enable the individual accounts that are provided” (Braun & Clarke, 2006). The six phases described by Braun and Clarke (2006) are used to frame the explanations of the steps taken during data analysis for this study: (1) familiarising oneself with data (2) generating initial codes (3) searching for themes (4) reviewing themes (5) defining and naming themes (6) producing the report (p. 87). It is noted that these stages or processes are guidelines that are similar to other qualitative analysis approaches and are often used recursively (Braun & Clarke, 2006) but they are nevertheless useful here in structuring the explanation.

Familiarising oneself with data

All interviews were conducted by the researcher and so familiarisation with the data began during data collection. Most of the transcription was outsourced to a professional company and

therefore this step cannot be considered as a data familiarisation technique used in this study. Data familiarisation was achieved by “reading and rereading data, noting down initial ideas” (Braun & Clarke, 2006, p. 87). Recordings of the interviews were accessed where the transcriptions contained the phrase “inaudible” or inaccuracy was detected the transcription of contextual and cultural jargon.

Generating initial codes

Initial codes were generated manually by reviewing paper printouts of the interview transcripts. Key quotations were underlined and initial codes were recorded in the margins of the transcripts. I began with the transcript of the project coordinator’s interview. The codes recorded were: collaboration, community, leadership support, technical problems, working out problems, professional development, coaching, in-classroom support. Codes noted on transcript of the other interviews were: teacher voice, view of the project, disappointment with the project ending, student response to access to technology and curriculum changes, sustainability of projects, approaches to professional development (whole day, after-school workshops, coaching, in-class support, just-in-time support), collaboration within and across schools, change process, identity, student-centred pedagogy, sense of community, relationships between schools, importance of relationships between colleagues in relation to learning and brokering of knowledge. I juxtaposed some of the emergent themes identified in data with concepts from communities of practice theory and made links to closely related studies from the literature (see Appendix H). The original presentation of emergent themes and supporting quotations might be scrutinised as a cherry picking approach (Skues & Cunningham, 2013). However, this is mitigated in the subsequent phases. The process of linking some of the emergent themes presented in Appendix H was an

important first step in beginning to frame the analysis using the communities of practice framework.

Searching for themes

The initial themes that were identified from the data in the first phase was useful in this phase because it is important to note that NVivo software only helps to organise the analysis process; it cannot do the thinking for you. It can support creativity in trying different approaches to view the data and develop connections (Corbin & Strauss, 2008). After initial reviewing of transcripts and notation of themes generated manually, data was auto-coded by responses to the questions using the semi-structured question headings in NVivo (see Appendix I). This meant that all responses to the same question by each participant could be viewed as an individual node. This is a simple task that does not need to be performed through manual coding and is worth the preparation in formatting the question heading as a heading style in word. This was useful in early formulation of themes because I was easily code the manually generated themes against the auto node categories across multiple participants.

Reviewing themes

During data analysis, it became apparent that there were three main aspects of importance. The first was collaboration and the sense of community. There was also a sense that the teacher professional learning and coaching were critical element. Then coding was approached from three main perspectives: the whole community, the professional learning and coaching. Previously coded themes were reorganised under these three overarching headings. The counter experience of negative instances or how these things could have been improved became another three areas. I was careful to look for the case and the opposite case. A thorough re-coding process was

conducted on each transcript. Quotes coded against the emergent categories were reviewed against the finer node categories. Once it was checked that each that each coded item had been included in the new structure then they were uncoded from the original node. All text which was not included in the coding was carefully scrutinised as to the reason for its exclusion to make sure that the data was not relevant due to being conversational rather than excluded because it did not fit the argument of the research. This resulted in six themes and multiple sub themes (see Appendix J).

Defining and naming themes

Data was analysed by the common themes closely related to the question topics, the resulting participant responses and in relation to theoretical framework in a recursive fashion. In the early stages of the research I thought I would code the data according to the four components of learning presented by Wenger (1998, p. 5): practice, community, identity and meaning. However, as I developed a deeper understanding of communities of practice framework through my experience in the analysis I focused on data relating to mutual engagement, joint enterprise and share repertoire as well as themes coming out of the data about professional learning, coaching and brokering. I went back to the literature to inform the analysis process. At this stage of the process I formulated a map of how the data was shaping against the research questions Appendix K. I thought of the three overarching areas in terms of theatre metaphors. I saw the community focus as preparing the stage, the professional learning and in-class support as the performance and the supporting factors for coaching as behind the scenes work. The data was recoded and shaped as viewed more closely through the lens of the communities of practice framework and was later developed into some draft overarching and sub findings (see Appendix L).

The resulting themes, findings and overarching findings became the focus for each of the findings and discussion chapters. The final stage of coding shows the nodes preceded by chapter and section numbers. During this later stage, the focus on technology initiatives later formed another chapter, research question and overarching finding. This can be seen in discrepancy of numbering the coding nodes (see Appendix M) where technology initiatives are created as a new set beginning with 6.0 and there are still groups of nodes under 7.0 professional learning that are still labelled with nodes preceded by 6. This is because the three sections that corresponded with chapters five to eight became four chapters. It was at this point that continual updating of the coding against data organisation in the chapters was disbanded. All interviews had been coded against this set of nodes to this point. The number of nodes and references to these in the interviews can be seen in Appendix N. An example of coding stripes on one interview with only chapter coding nodes highlighted is in Appendix O.

Producing the report

As described in the previous phase, the three main finding areas were reshaped as four. The resulting findings supported by the thematic analysis were evolved as follows for each of the four findings and discussion chapters:

1. Professional learning in technology integration into the curriculum was most successful when communities of practice were formed.
2. Technology implementation practices around laptop and learning management initiatives involved a locally negotiated response.
3. Professional learning in technology integration into the curriculum was most successful when multi-tiered programs were offered to teachers.

4. Professional learning in technology integration into the curriculum was most successful when supported coaches leveraged the learning for teachers in integrating technology.

The producing the report phase is “the final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back the analysis to the research questions and literature, producing a scholarly report of the analysis” (Braun & Clarke, 2006, p. 87). The process I undertook at this phase was to reduce the data to be included where it did not address the research questions. The main theme excluded at this phase was a large amount of data about technical issues. The final analysis and write up included the reshaping and focusing of findings during the process of discussion in relation to communities of practice framework and literature.

This section has discussed the data collection and analysis phases. The following section focuses on the robustness of the study in relation to trustworthiness.

4.6 Trustworthiness

In this section the criteria of “trustworthiness” as used in naturalistic research, including credibility, transferability, dependability and confirmability (Guba, 1981; Lincoln & Guba, 1985) are used to consider the robustness of this study.

The criteria for trustworthiness is used to assess the strength of this study (Guba, 1981). Trustworthiness is the term used for assessing qualitative research by prominent methodology theorists as a redefinition of the criteria of validity and credibility associated with the positivist paradigm (Golafshani, 2003; Guba, 1981). It is important to note that Guba made the qualification that these proposed criteria were never intended as a checklist for qualitative studies; however, it

has been useful here to guide this discussion of trustworthiness within these broad categories. Criteria or guides must be “applied contextually” to constructivist research (Manning, 1997, pp. 93–94). Guba (1981) formulated four aspects in determining trustworthiness in research and provided a comparative matrix of the terms applicable to rationalistic and naturalistic studies. The four aspects of trustworthiness are truth value, applicability, consistency and neutrality (p. 80). Table 7 shows the appropriate terminology used by the two schools to represent the aspects of trustworthiness.

Table 7: Scientific and Naturalistic Terms Appropriate to the Four Aspects of Trustworthiness (Guba, 1981, p. 80). Reproduced With Permission.

| Aspect | Scientific Term | Naturalistic Term |
|---------------|---------------------------------------|--------------------------|
| Truth Value | Internal Validity | Credibility |
| Applicability | External Validity Generalizability | Transferability |
| Consistency | Reliability | Dependability |
| Neutrality | Objectivity | Confirmability |

In the following four sections, the naturalistic criteria are considered for this study. Guba (1981) pointed out that these are not fixed categories for assessing a study and that consideration of the purposes of the study and its methodology must also be taken into consideration. These four areas have been chosen to frame this discussion and focus on aspects most relevant to the study’s circumstances, purpose and process. Reference is made beyond Guba’s explanations in considering the trustworthiness of this study.

4.6.1 Credibility

The aspect of trustworthiness represented in consideration of the truth value is credibility (Guba, 1981). The concept of credibility in naturalistic, constructivist or “interpretivist” (Patton, 2002, p. 546) perspectives is the appropriate alternative to the internal validity criterion used in

the rationalistic tradition (Guba, 1981, p. 80). Credibility in a qualitative study such as this one depends on the researcher's "theoretical sensitivity" (Glaser & Strauss, 2006). Theoretical sensitivity is developed through professional literature, professional experiences and personal experiences (Strauss & Corbin, 1998, pp. 47–48). The researcher in this study meets the criterion of theoretical sensitivity, which will contribute to the reader's confidence in the researcher's capability to interpret data in a way that is sensitive to it.

Longevity in the field also adds to the credibility of this study. This is considered a feature of high-quality studies, as it is a way for researchers to "demonstrate that they have developed a deep understanding of their research topic and research participants' views through the length of time they have spent in the field" (Roulston, 2010, p. 87). The researcher in this study was employed for three years by the project that became the case for this study, and in this way has met two of the indicators for credibility, namely, "prolonged engagement" and "persistent observation" at the site (Guba, 1981, pp. 84–85). This in turn raises the issue "anthropologists call 'going native'" (Guba, 1981, p. 85). In this sense, the researcher was a native because she was as much a part of the community as the participants in the study. Two strategies have minimised the potential problem of the native researcher. Firstly, the interviews were conducted almost two years after the project. This has minimised any problems associated with a potential conflict of interest that might be associated with being both a practitioner and a researcher (Vetter et al., 2011, p. 241). Secondly, the researcher has primarily relied upon the interview data from the participants to extrapolate findings related to the project. The balance struck between sufficient theoretical sensitivity and sufficient distance from being a native in the project by allowing two years to pass before the interviews adds to the credibility of this study.

The way the thematic analysis was conducted has contributed to the coherence or structural corroboration (Guba, 1981) of the study. When themes in the data were identified, the researcher also looked for contrary cases. A picture of the phenomena has been portrayed to include the multiple perspectives represented in the participant data. The researcher's theoretical sensitivity to the context added to the credibility.

4.6.2 Transferability

Transferability relates to the aspect of applicability in considering trustworthiness as an alternative to external validity or generalisability in the rationalistic tradition (Guba, 1981). The case selected in this study is unique and context dependent and so the findings are not directly generalisable (Guba, 1981). The aim of purposive sampling is to learn about a unique situation and measures to strengthen the transferability arising from this include collecting thick descriptive data (Guba, 1981). Guba (1981) suggested this leads to findings that are context-relevant and "will permit comparison of this context to other possible contexts to which transfer might be contemplated" (p. 86). The concept of transferability refers to whether the findings of the study may have relevance to similar settings. This study is qualitative case-study research conducted in a non-replicable setting, which means that the degree to which the findings may be generalised is limited. However, transferability may be inferred to school clusters with a focus on professional learning for teachers.

4.6.3 Dependability

Dependability, the term used to consider trustworthiness in the aspect of consistency, corresponds with the criterion of reliability used in a rationalistic study (Guba, 1981). In terms of the procedure used in conducting the semi-structured interviews, the data collection can be

considered dependable because the researcher conducted each of the interviews in the same way, and so there are no issues of instrumental instability (Guba, 1981). The semi-structured interview prompts were followed very closely during the interviews, adding to the stability of the use of the instrument. The researcher did not know all of the participants in the study and the interviews yielded similar commentaries. It is likely that the instrument could have been used by another interviewer and yielded similar data. However, the researcher being known to some of the interviewees might have led participants to believe some things did not need to be described or explained. On a number of occasions, the interviewer asked probing questions to seek further explanations from participants where they may have been assuming there was no need to explain further due to the researcher having been involved in the project.

4.6.4 Confirmability

Confirmability relates to the aspect of neutrality in considering trustworthiness and is the alternative to the notion of objectivity in rationalistic studies (Guba, 1981). The criterion of confirmability of a qualitative (naturalistic) study equates to the objectivity assessed in quantitative studies (scientific or rationalistic or positivist) and is also described as considering the neutrality of a study (Guba, 1981). In rationalist studies “objectivity is presumably guaranteed by the methodology” (Guba, 1981, p. 81). Investigator predilection is an issue that can arise in naturalistic research that can lead to bias (Guba, 1981). The researcher has kept an audit trail of decisions relating to the interpretation of findings to “document shifts and changes in his or her orientation” (Guba, 1981, p. 87). The researcher has also practised reflexivity in the process of data collection and analysis (Guba, 1981). Measures taken during data collection to strengthen confirmability are triangulation with observation and project documents.

Research bias has been minimised by the interviewer using topic prompts according to the interview guide and inviting the participants' free expression through being cautious not to "lead the interviewee" (Roulston, 2010, p. 87). Time in the field has also contributed to researcher credibility "to interpret insider perspectives, and have established sufficient rapport with participants to generate quality data" (Roulston, 2010, p. 88). Guba (1981) pointed out that "Naturalists are especially aware of this problem because they understand the multiple realities that one encounters (including multiple value systems) and the role that their own predispositions play when they use themselves as instruments" (p. 81). To counter researcher bias in this study, the analysis relies on primarily on the data that was collected in the form of semi-structured interviews. In this way, the researcher shifted the "burden of neutrality from the investigator to the data" (Guba, 1981, p. 81). Bickman and Rog (2009) identified a risk of bias in self-report data "if the questions deal with socially desirable behaviour, thoughts, or attitudes" (p. 20). Therefore, participants were given anonymity through pseudonyms to "improve accuracy of these data" (p. 20). It is the data then that is to be relied on for the synthesis of views to form findings based on multiple participant responses, and not solely the researcher's own observations.

A study of teachers who participated in professional learning through Australian Government Quality Teacher Program clusters posed a potential limitation of "self-report data" (Ingvarson, Meiers, et al., 2005, p. 18). This potential concern is countered by the argument that "teachers are not reluctant to speak their minds frankly when it comes to assessing the value of professional development programs" (p. 18). Ingvarson, Meiers and Beavis (2005) also added that "There is little reason to think that their responses might be biased one way or another, or desire to please, especially when, in studies such as the above, they are contacted several months at least after the programs are finished" (p. 18). In this study, it was valuable to have this later

perspective, as some staff were working in schools that had not been in such a project and they felt they had gone back in time in terms of progress with technology integration.

An imbalance in perspectives may have occurred due to three teacher participants being interviewed from Red Gum College and only one from River College. An additional complication was that many participants changed roles during the project. For example, Ben was a network-based coach for just six months before being appointed as ICT Leader at Ferny College. Therefore, some of Ben's responses are more from the point of view of a teacher leader in one school than the perspective of a network-based coach. This will become apparent in the data when it is revealed that people moved between schools and positions quite fluidly.

This section has outlined the ways this study has established trustworthiness in the context of the four concepts: credibility, transferability, dependability and confirmability.

4.7 Conclusion

This research is a qualitative case study. The project coordinator, network-based coaches and school-based elearning coaches were invited to participate in the study on the basis of their employment in those specific roles within the elearning community. Then snowball sampling was used to reach teachers whom the coaches had worked with. The study utilised a semi-structured interview methodology to collect the data. Analysis included thematic coding of the interviews using NVivo. The criterion of trustworthiness to evaluate the robustness of this study has been applied as appropriate to the scope and methodology of this study.

The next chapter is the first of four findings and discussion chapters.

Chapter 5 Findings and Discussion – Community of Schools

The findings and discussion presented across this and the subsequent three chapters correspond to the four research questions. All chapters encapsulate the broad guiding question of “What works in a learning community and why?” This case study draws on the literature about teacher professional learning and communities of practice to theorise what occurred in the development of this elearning community project. My experience working in the elearning community has also shaped the interpretation. Table 8 gives an overview of the research question and overarching finding for the four findings and discussion chapters.

Table 8. Structure of Chapters Five to Eight: Research Question and Overarching Finding

| Chapter | Research Question | Overarching Finding |
|-----------|--|---|
| Chapter 5 | 1) How does forming a network of schools affect teacher and coach experiences of teacher professional learning in the integration of technology into the curriculum? | 1) Cluster community formation positively influenced teacher professional learning in the integration of technology into the curriculum. |
| Chapter 6 | 2) How do teachers and coaches negotiate the implementation of large-scale technology initiatives of laptops and a learning management system? | 2) Shared repertoires developed in response to large-scale technology initiatives and were negotiated at the local level. |
| Chapter 7 | 3) How do teachers and coaches working to integrate technology into their curriculum experience professional learning within a network context? | 3) Teachers and coaches experienced a multi-tiered approach to professional learning in integrating technology into the curriculum across a network of schools. |
| Chapter 8 | 4) What factors support the work of coaches in their role to assist teachers to integrate technology into their curriculum? | 4) Coaches developed their practices through support for their own learning and connecting with others. |

This case study of an elearning community project set out to explore approaches to teacher professional learning in integrating technology into the curriculum. The purpose for the selection of this case was to gain insight into a project established to address the problem of the lack of integration of technology into the curriculum by teachers. The case was a government-funded project designed to address some of the barriers to technology integration, including a lack of infrastructure, technical support and professional learning for teachers. A key strategy in the design of the project was for schools to work together to address the issue of a lack of integration of technology into the curriculum, with the support of funding for infrastructure and professional learning for teachers. The aspect of schools working together to address this problem is central to the work of this thesis in exploring the broad guiding question “What works in a learning community and why?” Four research questions focus this case study presentation across the four findings and discussion chapters. This chapter focuses on the way schools worked together to develop a community approach to the common goal to integrate technology into the curriculum.

As indicated in Table 8, this chapter explores research question one, how does forming a network of schools affect teacher and coach experiences of teacher professional learning in the integration of technology into the curriculum? The focus of this question is the formation of a network of schools with a common goal. It presents the resulting overarching finding one, that cluster community formation positively influenced professional learning in the integration of technology into the curriculum. The five findings presented in Table 9 bring a level of specificity to this overarching finding over the next five sections of this chapter.

Table 9. Research Question 1, Overarching Finding 1 and Findings 1–4

| | | | |
|---|---|--|--|
| Research question 1: How does forming a network of schools affect teacher and coach experiences of teacher professional learning in the integration of technology into the curriculum? | | | |
| Overarching finding 1: Cluster community formation positively influenced teacher professional learning in the integration of technology into the curriculum. | | | |
| Finding 1: A cluster community developed between seven schools and helped technology integration as teachers were reassured that schools were all working towards the same goal. | Finding 2: Members of the cluster community connected with the broader landscape of practice. | Finding 3: Forming a cluster community between schools was an equaliser and reduced competition between the schools. | Finding 4: The cluster community was sustainable when supported by a funded project, but this was difficult beyond the funding period. |

The next section presents the first finding and development of a new theoretical construct, “cluster community” to describe the community formation in the elearning project. The subsequent sections address findings relating to the connections made beyond the cluster community, the equalising effect of the cluster community and the issue of sustainability.

5.1 A Cluster Community Developed Between Seven Schools

This section focuses on the development of a community between seven schools that came together because of a government government-funded project. The naming of the project schools as an elearning community came with the expectation that the seven schools would work together to develop elearning practices. The benefit of clustering schools made it possible to “provide professional learning opportunities directly relevant to the local needs and interests” (Ingvarson, Khoo, et al., 2005, p. 85). In other words, seven schools would work together to integrate technology into the curriculum for the benefit of all students. I introduce the concept of cluster community here to describe the formation of a community around a common purpose. The cluster community began with a shared purpose that arose from the project proposal, which positioned the group of schools as a network, or cluster, of schools. What distinguishes the cluster

community formation from the cluster of schools is the identification with the common purpose by its members and evidence of development of shared repertoires. The shared repertoires that developed as result of the cluster community formation are presented throughout the findings chapters.

The elearning community project began with seven principals signing a funding agreement with the Victorian Government based on their proposal document. A project coordinator was appointed to guide the implementation of the project goals across seven schools as per this funding agreement. The project coordinator, Emma (pseudonyms are used throughout), articulated the vision of the project as “creating an e-rich environment” with the purpose of “educating the kids better”. The way that Emma described the vision for the project was in alignment with the project proposal. Part of the strategy documented in the project proposal was a community approach to the project goals. Emma understood the purpose of the project in the following way and set the tone for community formation:

We were trying to create a learning environment in all our schools where there was the capacity to use a range of ICT skills and tools and actually make it a richer learning environment than just the four walls of the classroom.

As the coordinator for the project, Emma’s role was to bring the people from the schools together so they could become connected through “the coordination of their energies, actions, and practices” (Wenger, 1998, p. 179). The principals were the first group in the newly formed cluster of schools to come together. Emma worked closely with the principal group to formulate the enactment of the project goals.

The school principals came together as the Management Group for the project. Together with Emma, the project coordinator, they had to negotiate the coordinated approach to the project. For the project coordinator, it was challenging to work together with seven principals to negotiate how to develop a community approach to the implementation of the project vision. The process of negotiation of the implementation of project goals at the leadership level took place at semi-regular meetings of all the principals of the schools. The principals had not worked together closely before and brought different ideas to the project that needed to be negotiated into an agreed approach. Emma spoke about the “unique opportunity” in this way:

Working with the principal teams from seven different secondary schools was challenging at times. At all times! Certainly, they had not had the opportunity to work with each other. You know, schools are very autonomous, so to have a project where seven principals with seven different ideas—and sometimes seven different sets of objectives—working together and coming up with common objectives was, as I said, quite a different project. I enjoyed working with people, even though the management styles, everything, differed from school to school.

The process of negotiating to make meaning is not always a smooth or easy process, as indicated by the project coordinator describing this process as “challenging”. As Wenger (1998) pointed out, “a joint enterprise does not mean agreement in any simple sense” (p .78). This “negotiation of meaning” was an iterative process that occurred regularly throughout the project, reflecting “continuous interaction, of gradual achievement, and of give and take” (Wenger, 1998, p. 53). Due to her role in the project requiring negotiation with principals, Emma was affectionately referred to at times by project staff as our “fearless leader”. This negotiation and renegotiation of

the project goals by the Management Group represents their identification with the cluster community in its development.

The formation of community was an achievement for schools in meeting the project goals. Emma, the project coordinator, noted the power of forming a community where people started to work together:

People did actually start to work together much better than they ever ... or they never did at all before. It is again, not to underestimate that power of putting a community of people—like-minded people—together and what it can achieve.

Here the project coordinator talked about the power of forming a community and what it can achieve. At the time of the project, it was unusual for secondary schools to be working together. Sylvia, a network-based coach, described the schools working together:

It was the community of seven secondary schools and their feeder primary schools, but less directly. We were connected by a team of staff working together to facilitate ICT in those schools. Secondary schools working together at that level was quite unusual and they really were making concessions with each other and actually working as a team.

Sylvia's comment supports Emma's observation that people were actually working together. These comments give the impression that this might come as a surprise due to this being an unusual occurrence for secondary schools at the time of the project. Not only were the schools "making concessions" (Sylvia) to work with each other but, as Emma recognised, there was a "power" in bringing "like-minded people together".

A number of coaches were appointed to work with teachers as specified in the project proposal. Emma, the project coordinator, directly managed four network-based coaches appointed for the duration of the project. The school-based coaches (the full-time equivalent of one coach per school) were employed and managed directly by the individual schools, as was the case in Skues and Cunningham's (2013) study. The project coordinator, network-based coaches and school-based coaches formed a Project Team that met regularly as a way of bringing the schools together to achieve a common purpose. My analysis of the interview data from the Project Team members, confirms their understanding of and identification with the common purpose of the cluster of schools to support technology integration into the curriculum.

Coaches, whether school-based or network-based, indicated identification with the common purpose. Louise, a school-based coach, indicated that her school belonged to the community, thus further making the connection that:

The school is involved in a community where we have access to technology that we normally would not. We have the ability to use it in different ways, and we have the support of people who can help us implement that technology, with the support and feedback from a community of schools. That whole community thing was really good.

William, a part-time humanities teacher and part-time coach from Manna Gum College, clearly explained the project's aim when he noted, "It is a project to show teachers the possibilities and the advantages of using different types of technology in schools and how this can improve student involvement, engagement, teacher involvement, teacher engagement". Julie, a network-based coach, shared the following: "It was a student-focused project aimed at improving students' learning outcomes, and improving teaching and learning practices in the classrooms. Creating

collaboration. Yeah, it was just an amazing program”. Ben, a network-based coach and later ICT Leader at Ferny College, described it as “seven schools came together” and Robert, a coach at Banksia College, spoke of “our group of seven schools”. The common purpose was “ICT and how to use it in schools” (Ben), “the use of ICT in education” (Celeste) and an “introduction to anywhere/anytime learning” (Robert). These representative data examples indicate the sense of community with ownership of the common purpose.

Hilary, a part-time coach at Red Gum College, spoke about her experience of the project creating a sense of energy and excitement. She said, “It was an experience that was very worthwhile, and it was exciting; the change and the energy that it promoted in the school. It was a very powerful project. It was very enjoyable”. This shows Hilary identified with the experience and the change that took place. Jenny, also a part-time coach at Red Gum College, described the project and the purpose of the coach role to assist teachers with it:

Our school is or was involved in a government-funded project. It was to enhance learning with the use of technology by means of having coaches in schools who can assist teachers with professional learning, as well as providing the infrastructure and the equipment that makes elearning possible.

Jenny’s comment that “our school is or was involved” shows her identification with the common purpose, which she described as “to enhance learning with the use of technology”. She also showed understanding that “having coaches in schools” with the aim to “assist teachers with professional learning” was a key element of the project.

The energy of the cluster community was evident in Julie's description of her experience in the role of network-based coach:

The experience of working across the schools and with people that were like-minded and had the student at the centre of learning focus was just amazing. It was ground-breaking for me as an educator, as well as a leader in schools.

Julie appreciated working with like-minded people on a joint enterprise of student-centred, technology-rich curriculum: "Working with people that wanted to see ICT integrated, it is a tool, but to develop better teaching practices in the classroom so kids get better student learning outcomes was just amazing". Julie's identification with the cluster community and its common purpose is strongly expressed in these excerpts.

The Leading Schools Fund proposal planned for transformation to occur through collaborative work at the different levels, including principal, leadership and teacher levels, and my analysis of the data shows that this did occur:

The ... eLearning Community Cluster is focusing on whole school transformation in the seven schools, working collaboratively at principal, leadership and teacher levels to form a powerful network for change. The e-rich environment and the challenges it promotes are seen as a catalyst promoting and enabling change. (DET, 2004, p. 10)

Meaning for the elearning community was negotiated at different levels, including the levels of principals, leadership teams and teachers.

Cluster community formation developed through collaboration within and across the schools. People at all different levels in the project engaged with each other. The project coordinator, Emma, explained that “a really big focus of the entire project certainly was collaboration, and it was at a number of levels”. In particular, Emma “predominantly worked with principals, assistant principals, ICT leaders within the schools”. Just as important was her work “with the technicians”. Other levels of collaboration around practice were described by Julie, a network-based coach, who also spoke about working across different levels:

Working with different sets of kids from different schools being brought to one of the schools, collaborating with kids, staff, administrators [and] principal class. Collaborating with the seven principals, the network-based coaches played a key role in supporting decisions that they made. We would often use our knowledge and feedback to work with them and their leadership teams, to make decisions in regards to where elearning and ICT and digital technologies were going.

This example illustrates a practice of brokering where Julie describes working with the school leadership teams and “supporting the decisions they made”. The coaches played an important role in facilitation of the cluster community’s goals within the schools. The coaches’ role in brokering the community’s common purpose is illustrated throughout the findings and discussions chapters.

The project staffing structure was designed to facilitate collaboration at different levels. The project coordinator and network-based coaches worked across all seven schools and the coaches were permanently positioned in one school for the entire project. Sylvia, a network-based coach, reflected that “the staffing structure was really good” in that it enabled “different levels of contact with the teachers”. Sylvia noted it would have been better if it allowed “even more, access

to provide professional learning at schools rather than just in term two”. She attributed this problem to “just limitations with the school structure”. She made the inference that “obviously, the more contact you have with people, the more you could facilitate change”. This idea that the amount of cluster professional development does affect the impact the program can have was supported in the study of the Schools for Innovation and Excellence initiative (Ingvarson, Khoo, et al., 2005). When Sylvia spoke of the different levels of contact with the teachers, she was referring to being able to work with them as a group at professional learning workshops that teachers from any school could attend. The other level of contact was being able to work one-on-one with those teachers. The professional learning workshops were run by the network-based coaches once a year, over a four-week period. Sylvia mentioned that it was a constraint that this only occurred annually. Workshops were also conducted at individual schools. The benefit of facilitating change through “brokering” ideas through the workshops is touched on here. This is discussed further in the presentation of findings in chapter seven and eight.

The common purpose of integrating technology into the curriculum could be described as a “joint enterprise” (Wenger, 1998). The community formation between the cluster of schools supported the joint enterprise. Teacher participants identified with the common goal, indicating the cluster community formation extended beyond the coaches in the project. The teachers articulated a common understanding of what the project was trying to achieve and there was evidence that the teachers belonged to a cluster community in the way they described their involvement and clearly articulated the joint enterprise. As Glenn, who taught music and IT teacher and held the role of ICT Leader from Red Gum College, summarised succinctly, “We are involved in a network of schools that made decisions together”. The sense of engagement was indicated in the statement that the schools “made decisions together”. He highlighted the

community strategy that “based on a premise that the larger numbers, and the more heads working on one specific thing, made it easier for us to implement things that would otherwise be difficult to implement”. The intentional formation of community around the joint enterprise was based on the belief that the social construction of knowledge would help the community realise the practice more easily.

Some examples of the teacher participants’ statements that indicate that they were able to identify with the community and their common goal are presented here. Michael, a teacher from Manna Gum College, described the project as:

a coalition of local schools in the community that have teamed up to pool their resources with a bit of a coordinated approach to ICT and how to use it in schools; probably like a coalition of groups who are meeting the same goals.

Lewis, an English and literature teacher from Red Gum College, in this way summed up the project:

The school is involved in some sort of educational ICT network hub that encompasses several different schools. It was acting, in some way, as a central body for ICT use over those schools, or within those schools and around those schools. We were trying to move forward with bringing the schools further into the 21st century.

Carolyn, an English and humanities teacher from River College, noted:

Our school has been involved in a project to empower teachers and students to be able to access the information highway and to upskill so that they can keep up with technology

and keep up with information. It allows the schools to be up to date in their approach, and certainly giving students the best opportunities to succeed and have different pathways in their careers.

Mary, a teacher from Ferny College, summarised the goal of the project as fostering the effective “integration of computers into the classroom”. Lucy, a teacher from Banksia College, commented that “We are involved in the elearning community, which meant that we had resources, including learning coaches, to train us in new technology and assist us in developing resources that we could use in the classroom”. For Lucy, being involved in the project meant that she had coaches, new technologies and assistance with developing resources to use in the classroom. These examples illustrate the teacher participants’ identification with the common purpose.

These examples indicate identification with the cluster community in the following way. The teachers expressed that they, in their schools, were working together within a larger “coalition of local schools in the community that have teamed up” (Michael, an outdoor education teacher from Manna Gum College). That “we are involved in a network of schools” (Glenn, ICT Leader at Red Gum College) and “the schools are involved in some sort of ICT network hub” (Lewis, an English and literature teacher from Red Gum College) demonstrates their identification with the cluster community. They expressed the purpose as “a coordinated approach to ICT and how to use it in schools” (Michael) and “bringing the schools into the 21st century” (Lewis). The complexity of the cluster community operating in this project is indicated in the statement “a coalition of groups” (Michael). The purpose was “to empower teachers” (Carolyn, English and humanities teacher from River College). Primarily, the common purpose was to do with the upskilling of teachers in technology in teaching for these participants. The joint enterprise of teachers implementing ICT through support of coaches was clear.

A further example of the cluster community bringing different groups together is where Glenn, an ICT Leader, described increased collaboration across the schools at different levels, “especially in the second half of the project when we started creating the teams; like the elearning leaders and the technicians meeting together, and talking to each other”. He described the positive impact of “having that communication with other techs at other schools that we normally did not have”. The new connections and collaborative culture developed directly as a result of the individuals’ investment in engaging in the community.

The next example serves to show how the cluster community helped teachers feel a sense of being part of broader change beyond their school. Lucy, a teacher at Banksia College, also thought that the key benefit was the opportunity of sharing something new and being part of a larger community:

When you have got several schools involved, when you go and visit another school, it just gives you that sense that you’re part of a bigger community and that the things that you’re facing as a teacher are similar to what other teachers are facing. I have often found that in those classes you may have one little piece of knowledge, but someone has got something they can share with you.

Something that resonated with Lucy by going to the workshops was being part of a bigger community and coming in contact with other teachers who were facing the same things. One of the benefits was the opportunity to meet other teachers who may share knowledge or resources. The sense of community building through the process of bringing people together for the workshops is evident in this data from teacher Lucy.

Identification with the cluster community goals was demonstrated by the coach at Eucalyptus College, Louise. She believed there was a benefit in having other schools doing the same thing:

Just definitely the support around of having the other schools doing the same thing, of having that constant reminder of using IT. I think people fall back into their old ways if they do not see that there are other things that can be done, so I think it is just awareness that there are other ways to do things, there are other new activities that they can try and use in their teaching. I think this has opened a lot of people's eyes to the possibilities and the willingness to try new things. It has been a really good benefit for us.

The "willingness to try new things" expressed by Louise shows how "mutual accountability to the enterprise" at the individual school level helped to develop a shared repertoire. The "constant reminder" helped reinforce the common purpose and helped individuals and schools not "fall back into their old ways". Louise's comment that, "awareness that there are other things that can be done" indicates that brokering of ideas across boundaries was occurring. Without the new ideas being brokered across schools and reinforced by making meaning at the local level, the workshops would not have been as successful in the integration of technology by teachers in the classroom.

A cluster community formed across the seven schools and this helped technology integration because participants from different schools demonstrated identification with the same goal. There were benefits in forming a community with a common purpose of integrating technology into the curriculum. This community formation contributed to the aim of successful integration of technology because coaches and teachers reported that they felt they were achieving

the project aims together as a community of schools. This community building contributed to “shared ways of doing things together” (Wenger, 1998, p. 125). Many participants indicated they perceived the schools to be working together on the same goals.

In the elearning community there was a common purpose of technology integration in the curriculum. Wenger (1998) used the term “joint enterprise” to describe the common purpose that brings a community of practice together. The third dimension of practice as a property of community is “shared repertoire”, which refers to the way the community responds to the joint enterprise and negotiates meaning as it is implemented in practice at the local level. This shared repertoire is negotiated through a process of reification and participation. Wenger (1998) clarified that:

It is not necessary that all participants interact intensely with everyone else or know each other very well, but the less they do, the more likely their configuration looks like a personal network or a set of interrelated practices rather than a single community of practice. (p. 126)

Reification and participation occurred within the Principal Management Group, the Project Team and the teacher levels. These different levels could be representative of multi-membership in overlapping communities of practice; i.e., the principals might belong to a community of practice of themselves and also be members of a leadership community of practice within their own schools.

Emma, the project coordinator, admitted she was an optimist when it came to the expectation of schools actually working together. She expressed the surprise of the management teams of the schools that they all actually participated:

The project itself, the momentum that it gained, and the way that it moved forward, took all of us by surprise. When I say all of us, I am being optimistic. It took the principals and the management teams of those schools by surprise. I really thought that initially they thought, “Oh, this is just another one of those projects where we will get the money and we’ll buy what we want. We will do what we want and that is going to be that”. That is traditionally how these kinds of projects worked, but that is not what happened.

This quote forms evidence that the participation of the Management Group went beyond accepting the funding and that the community gained its own traction. The project coordinator had the aspiration of promoting the “joint enterprise” (Wenger, 1998) of integrating technology through her alignment with the project goals. She was pleased that the schools did not affirm that they were just in it for the money and that they demonstrated ownership of the project goals.

A cluster community formed across the seven schools. The configuration was larger and more complicated than a single community of practice and more closely knit than a constellation. Therefore this type of configuration is described here as a cluster community. There was evidence of identification with the joint enterprise of implementing technology in the curriculum across the schools. The joint enterprise extended beyond the project team and this was evident in the clear articulation of the teacher participants. The identification with the common purpose meant that the teachers demonstrated ownership. The project goals, to some participants, were seen as an outside influence to be negotiated and the joint enterprise was a “result of a collective process of

negotiation that reflects the full complexity of mutual engagement” (Wenger, 1998, p. 77). The level of identification was not as much as, perhaps, Emma, the project coordinator, would have liked, so perhaps the “boundary” of the cluster community did not extend to as many staff in all of the schools as Emma might have aspired. However, most of the group interviewed demonstrated high levels of identification. The study has established the development of community formation between the seven schools. This section now turns to the reasoning for the introduction of the term “cluster community”. A feature of this particular cluster community was a nexus group that will be discussed in section 8.1.

One of the issues for this study identified in chapter three was the lack of a term to describe multiple and overlapping communities of practice. The Victorian Government has funded cluster arrangements in schools with a focus on shared professional learning by schools. To my knowledge, this kind of formation has not been previously theorised. School clusters often formed a management group and had a coordinator that formed a central body to enable the schools to work together closely, but the practices might be too diverse to call groups of schools a single community of practice and too small and closely knit to call them a constellation of practices. The issue with the term constellation is that it can be used to describe a configuration as large as an entire education system.

In answer to the issue of terminology to describe a community with more discontinuity than a single community of practice and more cohesion than a constellation, this study has coined the term “cluster community”. Other theoretical terms such as “network of practice” (Brown & Duguid, 2000) were considered but that term does not encapsulate the workings of the community in this case of seven schools, so cluster community has been formulated to describe the formulation of the community in this case. “Cluster community” describes the closer working

relationship than what might more broadly be thought of as a network or cluster of schools in name only. The key indicators for a cluster community are the identification of a joint enterprise across the community and evidence of a shared repertoire. This definition is easier to operationalise than communities of practice theory in the 1998 form but is not as simplified as the 2002 form. The conditions for a cluster community are readily applicable to school settings. This study has added to theory by defining a particular configuration that occurred as a cluster community.

5.2 The Cluster Community Connected with the Landscape of Practice

Members of the cluster community connected with the broader landscape of practice. Teachers and coaches connected with the broader landscape of practice by connecting with outside experts who came in, as well as connecting with others outside the community. This was of reciprocal benefit to the community and the connections in the broader landscape. Wenger, White and Smith (2009) suggested technology stewards “find tech stewards in other related communities and explore how they do their work” (p. 32). Coaches in particular found it beneficial to link with experts beyond their immediate community.

Coaches were encouraged to connect with the broader landscape of practice. Julie, network-based coach for the project team, said “It was always encouraged that as a network-based coach we keep abreast of what was going on. If we did not, we shared and collaborated to get ourselves all sort of up with something new”. As indicated here by Julie, continuous professional learning (Downes et al., 2001) was encouraged. Coaches were also able to learn something new from each other and this was because of the multiple nexus of perspectives (Wenger, 1998) that the coaches had. The nexus group that the coaches formed is discussed further in 8.1.

Some members of the cluster community developed international connections. Sylvia, a network-based coach, connected with educational technology experts from overseas, demonstrating her connections with the broader landscape of practice:

During that role, it started to foster the interest in things like education blogging that caused me to network with a lot of people, even overseas and things like that, that I may not have done if I was classroom teaching. It was because of the educational technologist focus that I was starting to network with people in similar roles overseas.

The international connections made through blogging led Sylvia to connect with the broader landscape of educational technology practices in person at international conferences: “The experiences of actually presenting overseas and all the conferences was incredibly valuable individually ... I know exactly what you need and how to go about it, and know how to get the audience engaged”. Sylvia found it beneficial to connect with other people in the educational technology communities beyond the project schools.

The impact of the project and work in schools spread further to benefit other schools and their teachers through workshops and presentations made by staff from the project schools. Julie, network-based coach for the project team, shared ideas and practices developed in the cluster community across the landscape:

We also delivered it state-wide at international and global conferences, where we delivered on our expertise and our findings, right down to we are still showcasing this year at Innovations Showcase, as well as Hobart, at the Asia–Pacific [ApprendWeb] Conference. The things that the elearning community schools are still doing and have

done. I am still being contacted by various schools that are not elearning community schools, to get information on PDs that we run or how we ran our PDs.

Julie also mentioned that a teacher from Banksia College also presented at Innovations Showcase. Tanya mentioned that she had “delivered PD with Pennie White at the VATE teachers conference, which is for English teachers”. Jim, a coach and ICT Leader, said “We had other elearning community people coming in, and we also took it to the VITTA [Victorian Information Technology Teacher Association] Conference”. Gwen, a teacher librarian from Eucalyptus College, talked about teaming up with the project coordinator, Emma, also a teacher librarian in the past, and presenting at the School Library Association of Victoria (SLAV) 2006 conference:

I explained about the digital portfolios and how students were showing their work electronically to their parents and getting feedback. I explained about the effect it was having on staff and student IT skills. I just explained what the project was, that it was a roll-out of laptops throughout these schools with accompanying PD and the effect on our schools.

The examples presented here from Julie, Jim, Sylvia and Gwen demonstrate that they were able to make connections and share their knowledge beyond the cluster community.

The broader landscape of practice was also a source for negotiating the joint enterprise through collaboration with staff at the Department of Education and technology vendors. Emma, in the role of project coordinator, also had the task of “working with people in the eLearning Branch and in the IT department, as well as Innovation Branch”. This collaboration with “a number of those different authorities in different projects” within different branches of the

Department of Education was a really important part of her work in the project. The project coordinator's comment here could be interpreted as developing her identity through alignment with the “coordinated enterprises” through her “engagement” with the Department of Education (Wenger, 1998, p. 174). Collaborating with authorities in the department contributed to Emma’s work as project coordinator. Being able to network beyond the schools was also important to Celeste, a coach at River College, who “got to communicate with, and get to know or develop professional relationships with people across a number of schools”, but also beyond the school; with “private industry, businesses that develop strategic relationships with the project, and then different committees at times”. For Celeste, her identity development through “engagement” with “broader enterprises” in professional relationships was also evident (Wenger, 1998, p. 174). In these examples, the cluster community was able to make connections with the broader landscape through Emma’s and Celeste’s engagement that influenced the practice locally.

Coaches benefited from having opportunities beyond the cluster community for their own professional learning. Jim, a coach and ICT Leader from Wattle College, expressed his engagement across the landscape:

I got to meet lots of other people, see lots of other programs. I got to talk to experts, sit at the feet of some of the gurus of IT education, and for me that was a real plus. I find it hard sometimes to do PD for myself, but to sit with [name omitted] and hear him face-to-face talk about programming was just wonderful.

Annette, a coach at Ferny College, also benefited from making connections through external professional development programs and engaging with outside experts:

I did not have scheduled classes so I had the opportunity for my own professional development over and above what I would have had as a classroom teacher. That is so valuable ... It is not like I had to leave classes and leave work for them and pick up the bits when I came back and they had to arrange CRT [casual relief teachers]. ... It was so valuable to see people from overseas that were visiting—wonderful ICT people. I just wish the teachers in the classroom had those sort of opportunities because they could be so inspired.

Coaches were generally able to access more professional learning than classroom teachers because there were fewer barriers to them attending in terms of cost and time, but Annette expressed here that she wished the teachers could have the same opportunity. Teachers could have had more opportunity to be inspired if given the time to be able to meet and learn from experts from the broader landscape of practice as Annette was able to do.

There are numerous examples in the data of connections made with local primary schools. One of these examples is where Julie, a network-based coach, mentioned the collaboration with local primary schools and some of the Schools for Innovation and Excellence cluster groups: “The project worked with the 50 something feeder primary schools also... we did a lot of innovations and excellence collaboration with other projects, getting primary schools and secondaries to support each other”. There are many other examples that mention collaboration with local primary schools, including the cluster school groups. This is evidence of the changing educational landscape that was promoting inter-school collaboration.

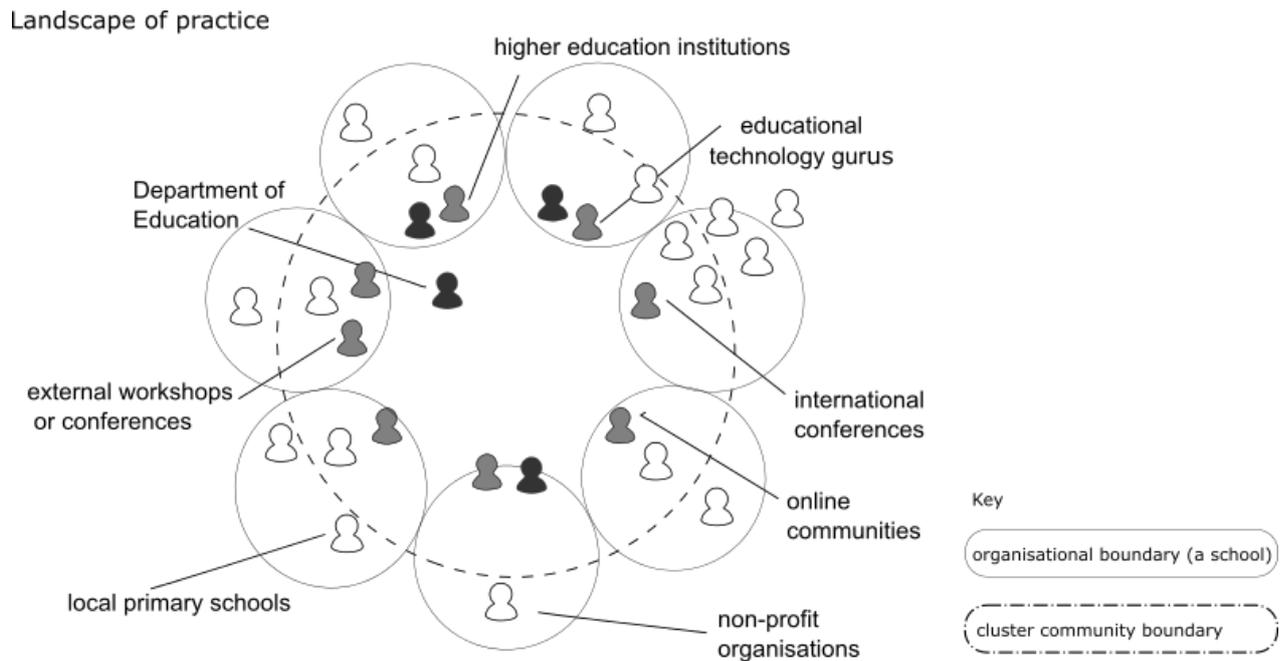


Figure 18. Connecting With the Landscape of Practice

Some of the ways the cluster community made connections with the broader landscape have been illustrated here. In Figure 18 the seven schools are represented by the solid line circles. The broken line represents the cluster community boundary in recognition in the distinction of the community boundary and organisational boundaries. The colours of the figurines represent the degree of community participation (as represented in Figure 14. Degrees of Community Participation (Wenger et al., 2002, p. 57). Reproduced With Permission. in chapter three) rather than specific job roles within the project. However, the participant job roles are likely to correlate somewhat with their degree of participation in the cluster community. Generally then, black figurines generally represent the project staff who worked across all schools. Grey icons represent the coaches who were school-based. The white icons could represent the teachers. The lines point to examples of the ways members of the community connected with outside influences. Other examples are given in subsequent chapters. Two notable examples of beneficial connections with

the broader landscape are the cross-sector collaborative projects discussed in 7.5. In Figure 18, some of the connections with the broader landscape made by members of the cluster community are illustrated.

In this section, the ways members of the cluster community connected with the broader landscape of practice has been demonstrated. The next section discusses the way the cluster community formation was equalising in that it decreased competition between schools because they had the same resources and goals.

5.3 Forming a Cluster Community was an Equaliser

In the previous section, some of the ways the cluster community connected with the broader landscape of practice have been highlighted. This section addresses the third finding, that forming a cluster community was an equaliser and reduced competition between the schools.

In the Leading Schools Fund proposal, principals agreed that, through the elearning community, member schools would take on the ethos to: “value our ability and accept our responsibility to promote the government education sector rather than individual schools” (p. 4). Operating as an elearning community for the collective benefit of the schools contributed to this aim. Analysis of the data supports that the individuals within the project did, indeed, identify with “being part of a community” with a broader responsibility than their own school. Hilary, a part-time coach at Red Gum College, identified with the broader goal and spirit of the community when she noted, “We are looking at more engaging ways to teach and learn, and to make learning a powerful experience for all students, no matter where they come from”. As Julie, a network-based coach, noted: “It opened doors for teachers, it opened doors for kids to do subjects at other

schools. Principals started talking about the future and where they were heading as a collective, not as separate identities within their local area”. The embracing of the entire community as their responsibility was in alignment with the project proposal to take responsibility for all students, as opposed to those in individual schools (DET, 2004). The concept of a cluster community is reinforced by Julie’s description of the principals negotiating where they were heading as a collective, rather than as schools with separate identities.

Clara, a teacher from Ferny College, mentioned that by having a “group of schools”, not only did they feel they were going through the same thing, but they felt it reduced competition between the them and improved the relationships between the schools:

You know we are all in the same boat, we have got the same sort of clientele. There is not the same competition as probably what we had before, because we have all got the same laptops and facilities. I think that helped improve the relationships between the schools.

The project was “an equaliser” between schools by providing the same resources and it had cost-saving benefits according to Clara, a teacher from Ferny College:

I suppose it was just a way of us getting the resources that we needed, but as a group and sort of levelling the playing field a bit. We are a bit smaller school, not as small as some, but schools like Manna Gum are much larger, had a lot more money, so more resources.

The project acted as an equaliser between the schools because they had the same technology available. She noted, “this sort of evened the playing field for us”. Clara went on to share:

We are all teachers, we are all doing the same things. We all have the same needs, so it made sense to sort of join together and do this PD that we all needed. In the long term, it would have saved money; rather than getting seven different presenters out at different times, for seven different schools. We could do it all together.

The project also meant that all teachers had access to the same professional learning workshops and follow-up support of coaches that were funded by the project. Individual schools did not have to find the funds for the workshops and coaches.

Glenn, an ICT Leader, also found there were benefits to a group of schools with a common purpose. As the technology arrived in the school, Glenn described having Emma, the project coordinator, as:

Fantastic. Because she was pushing everything towards what was new and what was out there; towards things that we might not have looked at, on our own, for a little bit longer. So, having the extra set of eyes and ears out there to find what was going on, and to make the ease of introducing this into a school. With interactive whiteboards, for example, we did not have to go out and explore what sorts there were.

Being part of a project that was doing the work of selecting and negotiating technology was a timesaver, according to Glenn, because “that stuff can really bog you down for weeks and weeks in a school, whereas having it all done for you, as part of an administrative model, was quite useful”. Glenn thought this central body was useful in an advisory and organisational capacity as well:

There is that whole set up, and as I say, Emma was pretty amazing at just sort of saying “Well, this is going to happen”; like, whether you like it or not, a lot of the times. “This is what is going to happen for the next two weeks, so you need to prepare your school for it”. And it happened. That could have taken us months to get organised on our own.

On the other hand, Glenn also described the potential negative flipside of the shared decision-making in that it “could be bogged down in the upper echelon”. He noted that one school can “make a decision very quickly about sort of getting something done within a couple of weeks”. He hypothesised that “if it has to go through a whole management team of elearning community, it could potentially take longer”. Although Glenn spoke about the potential for the decision-making to take longer, this was not his specific experience in this project.

The collaborative model of working together on group purchases was developed as part of the project (beyond simply the suggestion as to what technology to buy and where to buy it). Glenn, who taught music and IT teacher and held the role of ICT Leader from Red Gum College, noted that the model worked well, and he now coordinates initiatives—following this way of working, now that the project has finished. He commented at the time:

I did not realise that it was so organised in the elearning community in terms of the whiteboards. I actually, I copied that this year in making a network price on smart boards, and backed up by research that it is the best way to go, because teachers had done TPL [Teacher Professional Leave]. And then negotiated a network model so that even the small schools could have the boards for the same price as the big schools. I think that is a bit of a flow-on from the kind of stuff we were involved in with the elearning community.

The idea and practice of organising group purchasing was potentially a sustainable practice. The benefit of making group purchases directly benefited all the schools involved but especially the smaller ones in being able to take advantage of better purchasing power through discounts offered for larger orders. The way the schools worked together meant that “shared repertoires” (Wenger, 1998) developed around shared subjects, cost savings, purchasing processes and the competitive discourses changed to more collaborative ones.

The part-time coach and part-time ICT Leader from Wattle College, Jim, suspected some schools were not “really in it for the project”. It was his feeling that “they were in it for the money”. The project coordinator had expressed a worry that this may have been the case at the start but was pleased it turned out not to be. However, Jim still had a concern that one or two schools were just in it for “what they could get out of it” rather than having an interest in offering anything to other schools or the network as a whole as made explicit in the project proposal. In his role in the project, even as a school-based coach, Jim explained that “I went to every school and I helped them set up software that I had written that we should share. I helped them set up Joomla sites”. Unfortunately, he “did not feel that we got much back out of that”. He felt that “some of the other schools were a bit closed to sharing things back”. Whether this was because Jim had more to offer, having been an expert in the field for many years, is hard to determine. Jim did concede that sharing happened between the coaches.

Interestingly, a staff member from Jim’s school, Wattle College, described the project in terms of the resourcing benefit. Yvonne put it succinctly: “It enabled us to have the money and the funding to do some PD and to put out computers. But it did not enable us to have the technical support”. Yvonne framed the benefit again in terms of financial and technical resources: “How have I benefited? I guess at least we were able to get some funding. To enable us to take part in

some of these programs and educate other teachers about it". There was a mention here of the project educating teachers, but she gave the impression that she was a high-level user not requiring much assistance to integrate technology. The benefit of the program in her view was for other teachers to learn about it. She reiterated, "I would basically say we were given funding to increase teacher capacity in ICT in the classroom. That gave some funding to get some ICT resources". The phrase "we were given funding" was stated numerous times by Yvonne, as the main benefit of the project. She was hesitant to support that a wider collaboration happened for her. Yvonne could be considered a peripheral member of the cluster community and the way she spoke about her involvement as an identity of "non-participation" that is still a form of membership and identification with community (Wenger, 1998, p. 190).

Although not directly related to the cluster community of teachers, Emma, the project coordinator, talked about how the provision of technology did improve equity in access to technology for students:

It did give students in some of those schools an opportunity to use a laptop that they would not have had before. In fact, for some of those students it gave them internet access on a level that they had never had before. That was one of the objectives of the program, that we would, especially to some of our outer schools, be able to provide them with access on a regular basis, and the laptop program let us do that.

The project coordinator highlighted the equity issue that steps were being taken to address in the provision of laptops in the schools.

The cluster community was able to jointly negotiate their acquisitions and make joint decisions on what was purchased. This removed the “competing for the same resources” (Wenger, 1998, p. 126) element indicative of a constellation formation previously at play. Resources in this sense might be student enrolments. If one school had computers and another did not, then the school with the computers might seem to have an advantage in the competition for student enrolments. The schools had the same technology available and so levelled this to some extent. Schools need equitable funding in technology infrastructure to be on a level playing field in educational technology integration. The project was able to provide all of the schools with the same technology and this helped unity through equity. The matter of sustainability is considered in the next section.

5.4 The Cluster Community was Difficult to Sustain Without Funding

The previous section explored finding three, that forming a cluster community between schools was an equaliser and reduced competition between the schools. This section addresses finding four, that the cluster community was sustainable when supported by a funded project, but not beyond the funding period.

Julie, a network-based coach, described the project formation with the metaphor that “it opened up many doors for many people”. This metaphor was in respect to the sharing of best practice across schools and making connections between people that would benefit from those connections. Although the project funding had finished at the time of the interviews, Julie claimed that the “doors are still open”. This indicates some relationships between members of the community continued after the project finished. Julie went on to describe the cultural change that occurred during the project that had a lasting effect:

Having the role in the elearning community, you still get emails from people from schools you were at, asking for support, running a question past you, showing or sending you a great link, or sharing something that someone has done. Those things are still happening, but within the schools, because we had those roles, and I am still in one of the schools, staff are still very comfortable to say: Hey, I have done this. Do you want to have a look?' or "Would you help me with something I'm trying to do, please? I'm really stuck". I think definitely it has created an ethos.

Communication between the schools after the project ended took place largely via email rather than face-to-face contact. Julie indicated there was a small degree of collaboration going on; however, people with time were needed for sustainability: "It still goes on, on a very light basis considering the project is finished. Without that person based there with the time, I just do not think the project would have worked anywhere near as well". Ben, a network-based coach and later ICT Leader at Ferny College, commented that there were still connections initially made in the project, but it was not with the same regularity: "I find that when I move around the [community] I am seeing and catching up with people that we met at all the schools at the little get-togethers we used to have. Nothing regular though". Ben's collaboration has continued but not to the same degree as before, in his saying "nothing regular". These examples, and others to follow, indicate that even if there were aspirations for sustainability, the actual level of engagement decreased significantly after the formal workshops and other events which brought people together ended.

There was one particular instance of sustainability potential when Julie, a network-based coach who was at the time of interview an assistant principal at Ferny College, described the shared professional learning program as an element that was still running: "In a week's time we

are running another series of PDs for staff across the seven schools. In term three we ran a series at Manna Gum College where we used the same model as we used to and it worked beautifully”. This example demonstrates how the professional development model could still occur after the project was finished if the schools continued to invite teachers from the seven schools when they were running a workshop. However, this was the only recorded instance of the professional learning continuing and the majority of the participants felt that everything that had happened in the project had come to an abrupt end, as will unfold in this section.

One of the potential elements of sustainability was the culture of sharing ideas. Andrea, a science teacher from Wattle College, “moved to a different school” (not one of the project schools) after the project finished. She noted that she was “still collaborating with a lot of people at Wattle College” and this was likely to continue “for quite a while”. The fact that Andrea was still collaborating with people from the school she had been teaching at does not indicate sustainability of the project connections. Keeping connections with teachers from the school she had worked at is not surprising, in that many people keep connections with their former workplaces; however, Andrea did display a strong culture of sharing that may have been influenced by the ethos of the cluster community. She was sharing new ideas with the staff at her new school and likewise was learning “different ways of how [my new school] teach their students as well”. She suggested that these new pedagogical techniques “will end up going back to some people at Wattle College”. She developed new relationships in her new school and was becoming a member there by learning the practices as well as negotiating new practices. Andrea in this way brokered new ideas in her new school and had the idea to share the new ideas she was learning with her former school colleagues, even though she was now on the periphery.

The group that Emma, the project coordinator, considered “the most sceptical group” about the project were the technicians who were the people “still working together today” after the project had finished. The project coordinator reported that:

In the end that group of people, in their own way, became some of our strongest advocates. Of all the groups after the project is finished, there is still one group of people who meet once a month on a regular basis as a result of it.

The project coordinator described a number of reasons she believed this may have happened, included the support that the technicians offered each other and the enterprise of problem-solving together:

They ended up not just being support for each other, but they really liked being in that problem-solving place where they could actually say “Well, this is what we want to do, how are we going to get this done without breaking things or without compromising security?” It is worth looking strong resistance right in the face and staring it down sometimes! I think my technical background probably helped a little bit there too.

The technicians were involved in negotiating the solutions in a more engaged way than ever before. It is also evident here that Emma as the project coordinator was able to broker across the boundaries of the technicians’ group. A sustainable community of practice may have formed across the school at the level of the technicians. This was likely to be able to continue as long as the school leadership allowed the group to continue to meet. The type of configuration that the technicians represent is more reciprocal than the “network of practice” described by Brown and Duguid (2000). The technician group was more like the crossroads of practice in the Tapped In

community in terms of reciprocity (Riel & Polin, 2001), but even closer to the configuration of the intra-organisational communities of practice described by Probst and Borzilla (2008) that brought together people from the same occupational groups.

The following examples illuminate the issue raised in the literature about the problem with time-limited initiatives in relation to the theorisation that teachers need continuous professional development (Kennedy, 2005). Many participants felt that three years was not a long enough time-frame for support. Sylvia, a network-based coach, thought ten years would be a more effective timeline than three years for a project like this:

It was really building a community, but again I do not think three years is enough to achieve that community. I think we did make great inroads towards it, but it was something that would have steamrolled along. If you want to do something like this justice, you need ten years. It is quite frustrating to really feel like you are walking out on a job half done just because the money ran out.

Annette expressed her thought that more time was needed to achieve more sharing and collaboration:

It may have happened if it had continued on, so teachers sharing their experiences and their resources and their learning and students sharing all of that stuff as well, not within a school, but across a whole network of schools and, of course, globally as well.

The end of the project was cited by Annette and Sylvia as a reason that the collaboration between schools did not reach a pinnacle.

Teacher Michael expressed dismay at the project getting to a point and then stopping: “It was sort of just started up and people just got using that right, and then the funding stopped and then that was it. I suppose it ramped right up and became effective and then it stopped”. Michael criticised the “flash in the pan” nature of the project, indicating he thought it was short-lived. He noted that “there have been some good spin offs from it that have kept going, as far as educating staff and supplying staff with some resources to keep that ball rolling a bit”. Science and maths teacher Jayne, from Red Gum College, noted that the project activities were no longer occurring: “Lately I have not been able to share and do more stuff. This year the elearning has not been that continuous. This year we have not done much from the program”. Jayne saw the abrupt end of the project as “quite noticeable”. She could not understand why “it has happened that way” that the project was “a huge help to all” to suddenly having “nothing at all”.

Carmel, a teacher from River College, found the “PDs where everybody got together and there were different workshops groups workshops” useful. However, she “noticed they had not happened in the last year”:

There was involvement when it first started off, and I think that was really highly successful, but I seem to have had less to do with it in the last year. (Carmel)

Carmel also expressed her dismay that the coaches were not funded anymore. She expressed that she “Loved learning coaches, I think there should be more of them and it was a great initiative to start with, but do not leave us now”. She noted, “I found there was certain aspects I was able to incorporate into my classroom teaching and learning, but I would have liked to have seen more it in action”. Carmel wanting to do more professional development and see it more in action shows that it would have been beneficial if the project could have continued to support teachers.

Practices that developed around using the learning management system were not sustainable after the funding period. This was due to the system no longer being available to schools unless they signed up for their own subscription. Carolyn, an English and humanities teacher from River College, explained, that the differentiation of student tasks “started to fall down once we did not have the same system working on the project. Which was disappointing because we were hoping that was going to be sustainable”. Some schools did continue with the learning management system beyond the project period. The other issue was that the equipment provided at the beginning at the project had reached the end of its useful life. This issue is revisited in 6.3.

Participants did not appreciate the way the project ended or that it ended at all. It was echoed by most participants that more time was needed and that the project halted in the middle of something beneficial. Many teachers expressed that they would have liked the professional learning to continue. The coaches were missed. There was still a need to continue the professional learning after the project finished. Participants still felt accountable to the enterprise. Their identity had developed during the project and had incorporated alignment with the joint enterprise of using technology in the classroom.

Diane, a teacher of French at Manna Gum College, had learned many things during the project but indicated that she had more to learn and would “love it if the trial ... could continue and there were still learning coaches available”. She saw the short-term initiative as a trial and thought that it should continue. Gwen, a teacher librarian from Eucalyptus College, explained:

I hated the way it ended, the fact that it was a three-year thing and then that was it, bang. So as far as we were concerned we did not have anything much in 2008. I think that is

when we moved ahead ourselves, but that was a bit of a rude shock, all of a sudden, the elearning community ended. I know in some capacity there were still people employed in it, it was still happening somewhere, but it certainly was not happening [at Eucalyptus College]. I think that that could have been petered out over another year.

It is evident from Gwen's comment that the coach in the school was an important support that was missed. Gwen also commented that:

We knew it had a limited shelf life, but I do not believe in ending things so abruptly when we were working really well with people. The process takes that long to get going, and if you are telling me "Oh well" ... We all got going by the end of it—the three years to really build up to that momentum.

Gwen understood the project was time limited but that the ending of it felt abrupt. The project did have a partially funded coordinator for one day per week in the fourth year, but for most participants the ending of the project seemed sudden.

William, a part-time teacher and part-time coach from Manna Gum, was of the opinion that "there was success in the elearning community program" and thought it was "ridiculous just to stop funding after three years". He acknowledged that the "government was probably being very forward looking in arranging this elearning community program" but took a dim view of funding it for a short time: "I think they are very stupid in thinking 'We'll have a brilliant idea, we'll run it for three years, and then stuff you'". William suggested that:

They should have been able to develop funding for the things that were going really well and could be developed more. The coaching was a good idea and the PDs, that was

important. The interconnection between schools was important, getting people to meet and talk. There was more that could have been developed, but nothing was going to happen after three years when they stopped funding. That is just ridiculous. Sorry government.

Here, the disappointment with the end of a time-limited project was expressed. There was a sense of loss in the cluster community when the structures that supported it ceased.

William a part-time humanities teacher and part-time coach from Manna Gum College, predicted that the government would not have the foresight to see the state-wide learning management system project through successfully, as it had failed to look into smaller projects to get insight into what might work and what might not:

When I start thinking of what they are going to do with [the state-wide learning management system], there is just going to be such a balls-up, sorry. They have got coaches, which is a good idea, but I think it is again someone's brilliant idea who has not really thought of everything that is going to happen. I think for [the state-wide learning management system], there could have been a lot more experience gleaned from the people in the elearning community, and did they have another network like this?

This example shows that William thought that the knowledge and experience gained in the cluster community could have been informative for the state-wide rollout of a learning management system.

The project included a group of coaches as well as the coordinator role and this contributed to the formation of the group. For the elearning community, the coordinator fulfilled the role in the way Probst and Borzillo (2008) described the role of coordinators as "best practice

control agents” (p. 340). Some participants had contact with people from other schools after the project, but it was evident that this was not sustainable without funding coaches in the role. The coaches formed an important “core group” (Probst & Borzillo, 2008, p. 343) or “nexus group” between the schools (discussed in chapter eight). Probst and Borzillo (2008) identified lack of a core group as one of the main reasons for a community of practice’s failure. Hartnell-Young (2006) concluded in her study on collaborative projects that “their success required support through school leadership and organisation and state-wide technology infrastructure and funding” (p. 461). After the elearning community funding ceased, the coordinator and supporting project team members were no longer in place, the nexus between the school dissolved and there may have just been the relationship of a constellation. They had “shared historical roots ... related enterprises ... [and were] facing similar conditions” (Wenger, 1998, p. 127), but the identification that demarcated them as a cluster community decreased dramatically.

My analysis indicates that the sustainability of the community was impacted when staff were not funded for the time for these collaborations and therefore the nexus community of practice dissolved. In a similar study of Australian elearning coaches, Skues and Cunningham (2013) identified a theme to be that “3 years was not enough time for ICT to widely alter teaching practices” (p. 185). As participants in this study were selected on the basis of being coaches with the role of helping teachers to integrate the technology, and the teachers were selected by virtue of the fact they had worked with their coach, it is not surprising that there was identification with the cluster community by most participants. Most seemed to belong to the core or active group. It seems that the cluster community that formed over the three years of the project dissolved into a constellation of interconnected practices (Wenger, 1998) when the project funding ended and the contact between the schools decreased.

Aside from the technology reaching the end of its useful life, it was not possible for the community to sustain itself to the same degree as it could during the funding period. The joint enterprise that formed around the project was no longer a joint mandate to be done in collaboration. The continued email communication mentioned above might not be enough to still describe it as a cluster community. It might be that the schools became more akin to a “constellation of practices” after this period when the regularity and connection between the people dramatically decreased. Keeping in mind that Wenger (1998) warned that “treating some configurations as a single communities of practice would gloss over the discontinuities that are integral to the very structure, they can profitably viewed as constellations of interconnected practices” (p. 127). The schools may have kept their connection as a constellation of practice but the nexus group certainly was no longer present. Many of the people who worked in the project team either resumed their previous teaching roles, earned a promotion into leadership in one of the schools after the project or secured employment outside the project schools. Finally, the teachers were unable to facilitate working with each other as easily without the project team to organise this. The teachers no longer had the support for ongoing professional learning. Without funding to structure such a program, the benefits of forming a cluster community diminished.

5.5 Conclusion

This chapter has focused on research question one, how does forming a network of schools affect teacher professional learning in the integration of technology into the curriculum? The overarching finding of this chapter is that cluster community formation positively influenced teacher professional learning in the integration of technology into the curriculum. Four main findings relating to this overarching finding have been discussed. This first finding is that a cluster community developed across seven schools helped technology integration as teachers and

coaches were reassured that schools were all working towards the same goal. The second finding is that members of the cluster community connected with the broader landscape of practice. The third finding is that forming the cluster community was an equaliser. Finally, the fourth finding is that the cluster community was sustainable when supported by a funded project, but not beyond the funding period.

In the next chapter, the focus shifts to the way that two large-scale initiatives, a laptop program and learning management system were locally negotiated.

Chapter 6 Findings and Discussion – Technology Initiatives

In the last chapter, the finding that a cluster community formed across seven schools has been discussed. This chapter presents the findings and discussion regarding the local response to two major initiatives: the laptop program and the learning management system. This chapter provides analysis of the way shared repertoire developed in the community according to local needs. Table 10 gives an overview of the structure of this chapter.

Table 10. Research Question 2, Overarching Finding 2 and Findings 5–9

| | | | | |
|---|--|--|---|---|
| Research question 2: How do teachers and coaches negotiate the implementation of large-scale technology initiatives of laptops and a learning management system? | | | | |
| Overarching finding 2: Shared repertoires developed in response to large-scale technology initiatives and were negotiated at the local level. | | | | |
| Finding 5: Flexibility to adapt the approach to initiatives for the local context was part of the project design. | Finding 6: Student-centred approaches to learning became a shared repertoire. | Finding 7: The focus on student collaboration was negotiated locally. | Finding 8: Management of the laptops was negotiated locally. | Finding 9: Accountability to the enterprise was strong even when the practice was difficult. |

This chapter is a response to research question, how do teachers and coaches negotiate the implementation of large-scale technology initiative of laptops and a learning management system? The overarching finding that emerged from findings five to nine in this chapter is that shared repertoires developed in response to large-scale technology initiatives. The next section discusses finding five, that flexibility to adapt the approach to initiatives for the local context was part of the project design.

6.1 Approaches to the Initiatives Were Adapted for the Local Context by Design

This section presents finding five, that flexibility to adapt the approach to the initiatives for the local context was part of the project design. In this section, there are examples of goals set by the project but also how there was a message that the individual schools should adapt the approach to suit their context. Where the message may not have been clear the approaches were necessarily adapted anyway.

An important focus of the project was community building to promote collaboration, sharing and cooperation between the schools. This collaborative approach enabled shared repertoires stemming from the joint enterprise to develop at the school level. Employing learning technology coaches was decided at the project proposal stage, but how these people worked with schools to achieve the aims across and within the schools was to be determined collaboratively with the principals, leadership teams, project staff and teachers. Although the schools were joined as a community, they still functioned as separate entities in their day-to-day practices. Meaning was negotiated at the local level and demonstrated by shared repertoires in the context of two particular initiatives of the project, namely, the implementation of laptops and the learning management system.

The project was designed in such a way as to leave it to the community to decide how to achieve the project aims, which would have contributed to better alignment of the practice with the project aims. It was not negotiable that the aims be met. All schools had committed to this in the proposal. It was noted that teachers would share and collaborate, but the project goals were set from the time of signing the Leading Schools Fund proposal. Emma, the project coordinator, explained that collaboration was “an essential part of the project from the very start”. She

described how the community had the flexibility to decide how things would work in the project because it was intentionally set up with “no real guidelines”. In practice, this meant:

It was very much up to the community ourselves to come up with ways and structures of working together. I certainly strived to have as much of a collaborative model as we possibly could, and where the decision-making was collaborative, both between the schools and also within the schools as different aspects of the projects were being implemented. (Emma)

The project was set up in such a way that community members were involved from the beginning in determining how to achieve these goals. Emma’s overall approach to the running the project was by inspiring a “top-down” and “bottom-up” approach (Fullan, 1994, p. 7). Jaipal (2007) indicated that his framework for guiding the development of a collaborative learning community rested on a balance of “top-down and bottom-up” leadership (p. 1518). In this way “structure and flexibility” (p. 1518) can be accommodated. Jaipal’s theorisation is supported by this study.

This practice of making meaning being negotiated at the school level was expressed by Louise, a coach at Eucalyptus College, who mentioned that while it was good to all be implementing the same things, each school had to take it back and find their own way:

They would have to find their own way, I guess, on how they would like to use it and that you might use it differently to another school, but whatever you do will be valuable learning experience for the school.

Negotiability of the repertoire was also understood by Celeste, the coach at River College, who said that each school implemented the “laptop program in their own way” but “with input from the project and the project leader”.

Many participants appreciated the opportunity to see how other schools were operating. Jim, coach and ICT Leader at Wattle College, found that the “collaboration was good” as well as bringing ideas back to his own school:

I had a really good chance to work with other people that I normally would not have met. I managed to get to all six other schools as part of the project and work with each one. That was a great opportunity to see how IT was running in each of those schools, and both the positives and negatives at each one, and then compare those to our own and just see what ideas I could bring back to our own school.

The analysis of the interview data has revealed that the project was set up with clear common goals for the community of schools but that “meaning” was negotiated at the school level (Wenger, 1998, p. 63). In the elearning community, individual schools had the opportunity to influence the processes in the formative stages, leading to greater alignment with the project vision and goals. This is in contrast to Wenger’s (1998) case study of Alinsu insurance workers, where there was a greater distance between where decisions were made at the management level and where it was implemented at the practice level by the claims processors. The collaborative culture was not part of Alinsu company policy, whereas the elearning community intended to develop the project collaboratively. The community formation was around transformative learning rather than the reproductive learning of the Alinsu community of practice (DePalma, 2009).

Project funding allowed for provision of approximately 1,500 laptops at a ratio of one laptop for every two students at year levels seven and eight. This was staged over two years. Laptops were rolled out to the year seven cohort in the 2006 and then again to the year seven cohort in 2007. The project leadership did establish an expectation that the laptops were to be used collaboratively by students; however, it was left ultimately to the schools to manage the expectations and process.

Being a collaborative laptop program (one laptop between two students) influenced teaching practice. The project coordinator, Emma, reflected on the collaborative nature of the program:

The fact that it was set up as a collaborative laptop program, I think, was really, really important. It forced teachers to change the way they did things in the classroom ... You could not just replace a textbook with a laptop; you had to really think about doing things differently.

Schools implemented the laptop program in their own ways. Some schools did not adhere to using one laptop between two students. Some teachers used one laptop per student. There were strengths and weaknesses to both approaches. Emma reflected that many of the schools went to a 1:1 model instead of the planned 1:2. Some schools retained the collaborative model. Even those who did move to a 1:1 ratio approached it in a different way, as they had students doing different things at different times. This may not have been the case if the model was originally 1:1 and the use may have become a replacement of writing books with computers used for typing and maybe a little internet research.

The project coordinator reported that after the project, some schools went to a 1:1 program and others stayed “with more of a collaborative project or not a straight 1:1” (Emma). Even the schools that moved to a 1:1 were “looking at it in a little bit of a different way” (Emma). The first difference was that “they are not necessarily making every child buy the exactly the same thing and use it in exactly the same way” (Emma). The second way schools viewed the laptop program differently was that “their programs have ended up being much more flexible and probably with a broader scope than they would have been in the past” (Emma). This was due to the fact that “the schools learned a lot about not just managing them, but how they actually do support the teaching and learning process” (Emma). The jargon of 1:2 and 1:1 to describe the program was a shared repertoire at the department level beginning with school audits and goals of computer to student ratios that started with aiming for 1:5.

Another major element of the project was the implementation of a learning management system across the seven schools. Implementation of the learning management system was difficult in the beginning for several reasons including: people not understanding its use, initial network and data problems, as well as usability of the system. Some schools did report high success and use of the system. This was in schools that took a more systematic and mandated approach to implementation. The motivating factors for increased success in these schools was students not being able to say they did not get the work, teachers being able to communicate with students and students liking their work to be on the system, particularly senior students.

This section has discussed the flexible approach to the initiatives that were part of the project design. Even aspects that seemed to be mandated were necessarily adapted by local contexts. The next section discussed the development of shared repertoire in relation to student-centred learning.

6.2 Student-Centred Learning Became a Shared Repertoire

This section presents finding six, that student-centred approaches to learning became a shared repertoire. Student-centred learning became a shared repertoire around teaching practices in relation to the use of laptops and the learning management system. Student-centred practices in relation to the use of the laptops and learning management system were negotiated at the micro level of classroom teaching. Teacher practice was influenced by the positive responses from and expectations of students. These activities might have been initially a school-based decision, for example, to introduce digital portfolios across year seven, however, teachers had to negotiate the practice to suit their own way of working and their classroom experience. For some schools this became a collaborative focus for the teachers involved. Other motivators for using the technologies with students, even organisational reasons, are also discussed here.

One of the changed teaching and learning practices was the introduction of digital portfolios. Banksia College had adopted the shared repertoire of student-created digital portfolios at their school for year seven and eight students. Banksia College was using the learning management system as the platform for hosting the portfolios. Robert, a coach at Banksia College, stated, “We are using it for digital portfolios with our sevens and eights at the end of this year”. Maria, an English and humanities teacher at Eucalyptus College, described the positive impact on year seven students that the digital portfolio initiative had: “I have noticed the difference in terms of the kids and how much effort they put in their digi-portfolios using the laptops”. The digital portfolios were then the basis of work students would present to their teachers and parents during the new practice at Eucalyptus College of “student-led conferences” (Maria). While Maria felt “that it was a huge learning curve, for both the students and the teachers”, the result was worthwhile because students “certainly do take a lot more pride in

displaying their work”. The shift, in Maria’s words, was that students would now be “in the driver’s seat when it comes to the student-led conference”. The initiative meant a shift towards students taking responsibility for their own learning.

Gwen, a teacher librarian from Eucalyptus College, explained that, “the whole process of the digital portfolio that came out of the elearning community was certainly very collaborative”. Although Gwen attributed the digital portfolio initiative to the elearning community project, it was a local curriculum decision at Eucalyptus College to implement this. The school-based coach played a key role in supporting the success of this initiative at Eucalyptus College. A notable aspect of this initiative was that, according to Gwen, it led to great collaboration between teachers in the school. In her words, it “helped teachers work more closely together”. Gwen reported greater collaboration centred on “the best use of technology”. Teachers collaborated to plan the implementation of the new practice of facilitating student digital portfolios along with student-led conferences (to replace the traditional parent–teacher interview process).

Some of the pedagogical advantages of having the laptops available for Hilary, a part-time coach at Red Gum College, were being able to “follow lines of inquiry”. Hilary described the student-centred learning made possible with access to technology:

You can look up things that your class takes on as interests. You can make information products that are powerful. You can teach in a way that is accessible to all students. You learn skills that you need for the 21st century. It is like having a book with anything in it. It allows for students to work together and problem-solve, to do projects in PowerPoint and explore ideas that are big. Otherwise it is the teacher that has to know everything. It is really the students you are teaching to learn themselves.

Hilary showed that she understood the student-centred learning premise when she said: “it is really the students you are teaching to learn themselves”. In this example she explained how student-centred learning could be facilitated now that students had access to laptops.

Celeste, a coach at River College, supported the proposition that the project and having the laptops “changed the way teachers teach”; in particular, “the way that teachers are presenting their work and students are doing their work. Interesting projects using ICT started to happen and research”. She mentioned the laptop program was “fantastic” and that “our school was really lucky to be part of that program. It was extraordinary”. Laptops as a resource changed the approach to teaching according to Celeste. Carolyn, an English and humanities teacher from River College, described the way she worked with Celeste in the classroom to facilitate student-centred learning:

She came into the classroom. She worked with a number of different things with me as the classroom teacher, with projects with the kids using multimedia, videos and making their own writing, stories and editing. More recently, we have worked with things like wikis. We have used a whole range of elearning and we had the classroom laptops of course, which was the [elearning community] project. That was really great because the kids were able to do a lot of their English work using the laptops.

Having access to laptops and a coach meant that Carolyn was able to facilitate student-centred learning in her classroom. Evidence that the learning was student-centred was that Carolyn also noted that the students were using things she could not:

It certainly changed things for the students. They have the ability to use a whole lot of things that they are actually better at than we are, but it made the classroom much more interesting for them and affected their learning outcomes.

Allowing students to develop their learning and use tools that the teacher does not know how to use indicates Carolyn's comfort in being a facilitator of learning. The changing pedagogies were a joint construction led by a project leader. In her implementation of the directions indicated in the project proposal, and through the coaches, there was a ripple effect. Chapter seven and the illustrations of practice highlight other classroom practices that developed.

The benefits for students were a main motivator for use of technology in the schools. Peter, a part-time teacher and part-time coach at Wattle College, highlighted that using technology was a way to provide alternative educational pathways for students: "It is been a really useful thing for us to be involved with in terms of providing alternative educational pathways for our students". Peter also noted the initial enthusiasm of students in using the laptops: "The kids certainly really responded very well. Lots of people were very keen to be involved in it. The kids were all happy. There were some really good resources created and were brought out in the classrooms". It seems that people were keen to be involved due to the positive student response to the program. Peter also touched on the benefit of having the shared resources that were created.

Mary, a teacher from Ferny College who used the laptops "extensively", recognised that the initiative "has totally changed the way we teach". As reported by Ben, Julie and Mary, Ferny College took on ApprendWeb well and it was integrated into their daily practice, and that continued even two years after the project ended. Annette, a coach at Ferny College, would have liked more structure to the implementation. Mary commented on her usage: "ApprendWeb I use

extensively, communicating with kids and communicating with parents. I upload all my assignments there for kids. I have uploaded a lot of resources and particularly for Year 12. I have found that really useful". Mary found that she now "automatically" built in the use of laptops and the learning management system into her teaching. She expressed that "It has just become an automatic part of my life now. I would be quite startled if we lost it". Carolyn, an English and humanities teacher from River College, and one of the trainers of staff for ApprendWeb noted:

It was really great to be able to put work up there for the students, and have them able to access it from home, and the parents to be able to see what was going on. A lot of students used it very effectively. There were some students who did not have access from home. Even in the classroom it was very useful ... because a lot of kids forget what the work was, or lose worksheets ... so it was great that the work would always be there.

Aside from students being able to access work from home, a beneficial aspect of the learning management system was the ability to differentiate the work for students.

Carolyn, an English and humanities teacher from River College, highlighted that she had been using the feature of the learning management system that allowed for differentiating student work: "You were able to put differentiated learning in there, so that the kids would know which part they were meant to be doing, rather than thinking that they just had to copy off the person next to them". These new ways of teaching can be considered aspects of how a shared repertoire were negotiated and reified in the schools. This was one of the aspects of the system that was missed when some schools did not have access after the project finished. Using the learning management system for differentiating the curriculum was a student-centred approach supported by the system's features.

There were many reports that the learning management system was used for putting up work for students. Being able to put work up for students over the holidays was another use taken up at Red Gum College. Jenny shared:

We have got some real high flyers as teachers who are very keen to put a lot of work online. They have really seen that it is beneficial for students. Just yesterday I was helping one of our senior teachers put some work up for Unit 3 students so they can access their work over the holidays.

The learning management system was still being used for putting work up for students almost two years after the program ended. Although it took time in the uptake phase, good use was eventually reported by some schools.

Some participants found the main benefit of ApprendWeb was being able to put up work where students could find it. This was the case for Peter, a part-time teacher and part-time coach at Wattle College: “I have found it to be very useful because we can give kids work, we are set up there, they can find it”. Ben, a network-based coach and later ICT Leader at Ferny College, indicated that some of the teachers at his school “recognised that it is a way of putting the work up and the students cannot deny its existence”. He gave this example:

We had one the other day where the kid denied all knowledge of the work and the coordinator was able to show the work of the whole year that was on ApprendWeb. It gave the parents a rude shock. Here is a kid who has been fibbing to them.

As a practical matter that made a big difference in practice, students were not able to say that they did not receive the work.

Andrea, a science teacher at Wattle College, enjoyed the benefit of using the system to make students accountable for their own learning. She used the system with junior and senior students. This benefit extended to parents being able to see what students needed to do and was also a way of proving to parents that students did have access to work when they made excuses. Andrea explained: “I found it really quite useful because it was a way for parents to know what was going on and the students could not just use the excuse they could not do the assignment because they lost the sheet”. The learning management system was a useful way to create accountability for students and to gain parent support in students having to be responsible for their own learning.

Pressure for the joint enterprise of having the curriculum on the learning management system came from students. This is a form of accountability that occurred within the community that was not expected. Ben, a network-based coach and later ICT Leader at Ferny College, indicated that students wanted teachers to use the system:

The senior students love it. The big survey that we did with our students, while not all of them, but we got over 300 of them, quite a proportion of them said that ... they want the teachers to use ApprendWeb more because it helps them organise their work better.

Ferny College had firm data collected from students about their preference for all their course work to be online, as reported by Ben.

Being able to communicate with students using the system was a direct benefit of the learning management system. Motivation for using the learning management system for Maria, an English and humanities teacher at Eucalyptus College, was communicating with students:

I am up to the point where I can put things up on there. There are things that I have not been able to do successfully with ApprendWeb though. It is a great way of communicating with the kids though, I must admit. That is the hook that got me into it.

Using ApprendWeb for communicating with students was “the hook” that motivated Maria to use the learning management system.

Being able to put curriculum online including videos was a new way to facilitated student-centred learning in that it is self-paced and on-demand. Louise, the coach at Eucalyptus College, saw posting work as the beginning of changing the way teachers at her school use ICT:

It is one of the things that has really started to change the way people use IT because they are finding that you can put things up there. We use it mainly for students to have access to documents. People are starting to put up things like videos and activities on there. That is still an evolving thing now. All our staff are comfortable with using it. I can only see that increasing.

Being able to put the curriculum online was an important change in practice at the time of the project. To be able to include video materials with student work online was not as easily available for teachers before the project.

Some teachers were using the learning management system for online testing, according to Jim, a coach and ICT Leader from Wattle College:

We had people using the online testing, particularly at senior level, just taking a class in for the first few minutes, into an IT room, getting everyone to do a quick test to see where

they are up to, students would print out their results and read the feedback, and then they'd go back into a normal classroom. That was quite a cool use of that particular technology.

Online testing was also an innovation at the time of the project. Only the year seven and eight classes had access to laptops in their classroom. The response from Jim reveals that for other classes, a computer lab needed to be booked for online testing or any other use of the system.

Julie, a network-based coach, was a high-level user of the learning management system. She was able to communicate with her students using it even when not physically present at school:

I have found it essential. I have been at PDs where I have had internet access and I have started a chat room where I have left work for kids, and they have seen me online and have spoken to me via the learning management system about what activity they were actually doing. I have actually answered blogs while away from school for work reasons, put comments on blogs as the kids were writing it in my technology classes.

She demonstrated the practical use of being able to communicate with students when absent. The next reflection by Julie also demonstrates the student interest in using the system:

As a teaching tool and kids want to go on further. They have got their assessment tasks up there already. They can comment on it, they can send you straight emails with work. The fact that they send all their assignments to you and you can download all the assignments at once and then have a dialogue with them and their parents.

Julie persisted with the use of the system and maximised its use. This is not surprising as she had been a network-based coach for the project.

Being able to post assignments and class notes was seen as a benefit of using the learning management system for Clara, a teacher from Ferny College: “It is really good to communicate, say, if I have had students missing from a class. I will post the notes or assignments. It is really good putting the assignments on and then they can submit from home”. Clara was a teacher at the same school (Ferny College) where Julie, a network-based coach, became the assistant principal after the project ended and the practice of using the learning management system for student assignments occurred. Unfortunately, not all of the teacher participants from all the school were able to use the system at this level, as the initial challenges were too great.

As Julie’s post-project role combined being an assistant principal and elearning coach, it is not surprising that she took advantage of the administrative benefits, such as being able to send a newsletter to all parents as well as directly communicating with students about daily work and assignments:

The fact that I can push out the school newsletter via the learning management system straight to parents’ iTunes accounts on either phones or their home computers. It is a tool that you cannot live without. The fact that the tool that we chose was very icon-based and pretty much easy to use was a win–win.

Julie’s use extended to the parent body, which was quite progressive practice for the time of the project.

This section has discussed finding six that student-centred approaches to learning became a shared repertoire. The next sections discuss finding seven, that the focus on student collaboration was negotiated locally.

6.3 The Focus on Student Collaboration was Negotiated Locally

This section discusses finding seven that the focus on student collaboration was negotiated locally. The negotiation of one laptop between two students by individual schools is discussed here. The tensions between the program model and local implementation are highlighted. This boundary and local negotiation was a source of learning and contributed to changes in practice.

Jim, a coach and ICT Leader from Wattle College, was wholeheartedly committed to the 1:2 model both in theory and in practice. He thought that if the school caved into the Department pressure to have 1:1, it was the wrong way to go. Jim's school was still running a 1:2 model two years after the funding for the project had finished. The fact "people have not stuck with the 1:2 model" was disappointing for Jim. He still thought, "It is a better model than 1:1". This was from two points of view: "I think both from a cost point of view, from a maintenance point of view, and I think the collaboration you get with one laptop in a group of students is far better than everyone having their own little world" (Jim). Jim's school decided to continue with the 1:2 model in the following year, but he felt that there was pressure from the government for schools to go to 1:1:

That is coming from the Department, so we are probably not going to have much choice, but I think it is the wrong way to go. I think the focusing gets back to the technology as a piece of technology, rather than the technology is one tool amongst many in student work.

This reflection by Jim shows how the shared repertoire of the collaborative one laptop between two students program affected approaches to teaching and learning. His identity as a teacher was aligned with the project thinking around the pedagogy of collaboration. This was likely to still influence his approach to teaching even if one laptop per student was available.

While there was general support for the collaborative approaches for learning, there were practical problems identified with having only one laptop between two students. Yvonne, a teacher from Wattle College, agreed with the pedagogy of the collaborative program but found that it caused issues around assessment:

I love the laptop program. I do not particularly like the 1:2. I agree with having collaborative group work in the classroom. In particular, after pushing the 1:2, after the first year, I noticed I had few results of how kids were going independently.

The consequence of this for Yvonne was that “when you go to do the reporting and all your assessment is collaborative, then it is very difficult”. One of the problems she faced was how to produce reports for individual students when classwork had been produced collaboratively. Yvonne’s priority on being able to produce individualised reports meant that she was not able to embrace the collaborative pedagogy to the same degree as Jim.

Hilary, a coach from Red Gum College, talked about a mixed reaction to the 1:2 model in that “some people liked it and some people did not. And which in reflection I can see there were good things about that and for other things, that sometimes you do prefer one”. Jenny, also a coach from Red Gum College, thought “The 1:2 program was great”. A sense of gratitude was conveyed in the statement that it was “fantastic to have that much access to technology”. On the

other hand, Jenny expressed that “by and large our teachers are crying out for a 1:1 program”. One issue Jenny identified with the collaborative program was that “having students collaborating just did not always work, because very often you would have a dominant person and the other one would sit and goof off, and they just wouldn’t really get much out of the experience”. As a result, Jenny explained that the school was “moving to a 1:1 model next year”. Jenny seemed careful to share the positive aspects of the original program in the same sentence as any issue with the collaborative model. Eager to highlight the positive aspects of the program, Jenny added “Certainly the 1:2 was a really good start, and our teachers have really come a long way due to the access to technology that they’ve had”. The way Jenny ensured positive effects of the 1:2 program indicated accountability to the enterprise. In the same way that Yvonne supported the collaborative pedagogy of the program, there were issues with some elements in practice.

Some schools preferred to use one laptop per student as opposed to the one laptop between two students model. Eucalyptus College was one of the schools that quickly moved to 1:1.

Louise, a coach from Eucalyptus College, expressed that:

We did not really work to the 1:2 model well. It did not work for us. It does not work with a learning management system. We found that a big problem because [students] need to access their own area and save their work in their own area. We did not find that the 1:2 worked very well. We ended up just using it 1:1. We would just get two sets of laptops to make sure every student had a laptop. That is the best way it worked for us ... It doesn’t stop you doing group work. For us anyway, the 1:2 did not encourage group work, in fact it just created problems.

Louise was not against the pedagogy of group work and did not think that 1:1 stopped group work from happening. Louise's school went onto a 1:1 program after the project, achieved with a parent lease plan and a partial school contribution.

Louise also talked about how teachers at her school did it their own way, as they could not manage the way suggested by the project team members:

We have found the whole thing valuable but also in some ways a bit restrictive. A little bit like, for example, with the laptops, we as network-based coaches and coaches had the group there had an idea about how we thought they might get used, but the reality is back in the classroom that probably was a bit too much for our staff to take that all on. In some ways staff felt a bit dictated to, whereas they went and did it their own way anyway, which is okay.

At Eucalyptus College, staff just used two sets of laptops so each child could log into the learning management system individually. Louise spoke about how it did not suit the teachers at her school to use the laptops 1:2 and indicated that to stick to this would be "restrictive". She also thought it was "okay" that they did it in their own way. This shows negotiation of the enterprise at the local level. Group work and use of laptops could still be achieved (the main joint enterprise) but at the level of practice sticking to the mandate of 1:2 was problematic, so this was adapted to suit the local context. Louise shows there was still mutual accountability to the joint enterprise but that the approach was negotiated to suit in their practice of meeting the joint enterprise.

Teacher Clara, from Ferny College, was aware the program was a 1:2 laptop program, but in her school, it was possible to book two trolleys of laptops. She appreciated the access to laptops

in general that they did not have before: “Yeah, we are lucky enough to have one laptop between two”. Clara was able locally to negotiate the repertoire of use to be a 1:1 model because later in the program laptops were centrally bookable by teachers, “so it is possible to book more than one trolley”.

Sylvia, a network-based coach, noted that the program did give “opportunities to get teachers thinking a little bit differently by forcing them with the 1:2 ratio rather than the 1:1”. Like others, she conceded that 1:1 had to happen. Sylvia felt the 1:2 model was partially because the elearning community did not have the funding to do 1:1. Sylvia also had the insight that teachers may have just “used them like a textbook” if they were not forced into the collaborative model. This new way of teaching or thinking differently indicates the negotiated shared repertoire. As she noted:

Having said that, since then I think I have revised my opinion on it and I do agree with the experts that if you really want to get things happening, you need 1:1, I think probably justifying that a little bit, because we couldn't have 1:1. It was always the official line that it was an intentional choice because there were advantages, and I do agree that there are advantages too. And I think if we had gone 1:1 straight away we might have had a lot of teachers who used them like a textbook, so I still do agree with that.

Sylvia was of the opinion that “eventually if you are going to do major significant change, you probably need access to 1:1”. To promote a collaborate learning program was, according to her, a matter of professional learning “to try and change teachers’ thinking so they are willing to just get six out if they only need six”. Sylvia noted that if you have 1:1 you do not have to always use the 1:1 and can still do collaborative work. Ultimately, it was seen to be easier to have 1:1 to

“actually get the hands on”. The elearning project did promote the development of curriculum that included collaborate learning. The availability of one laptop between every two students also contributed to a need to develop collaborative programs for students.

Some schools faced problems in transitioning to a 1:1 program after the program finished, because it was then parent-funded and could only be an optional program in government schools. Robert’s school, Banksia College, was also going to a voluntary parent-funded 1:1 program, but the school only had about 50% uptake at that stage. Robert, a full-time coach, pointed out it could not be forced because of being a state school. William, a part-time humanities teacher and part-time coach from Manna Gum College, reported the uptake at his school was higher than the uptake reported by Robert at Banksia College, although this was still problematic:

We have gone to the supposedly one per kid, but it does not quite work that way because it is voluntary. You end up with about 80% to 90% of kids with laptops, which is just enough to make it annoying. So that you have got to send kids out to get computers from the library and things like that. The one between two, it worked, you find out what – well, you could use the computers, you would plan your lesson for using one between two, and I think people got used to that even though there were a significant proportion, I think, of people who would have preferred one computer each kid. Now, with one computer per kid supposedly, there are still issues because kids do not always bring them, they are not always charged up, things like that. It really requires a different way of organising your lesson.

Although William found it annoying to have to send kids to the library to borrow laptops, the school was resourced enough to have borrowable laptops to make an optional program more viable after the funded laptops were becoming outdated.

Teachers and coaches were committed to the joint enterprise of collaboration between students in class, but found many problems with the 1:2 model. One problem was if the half set was incomplete, then the ratio of 1:2 was not available. Even with a commitment to collaboration between students, there was still the problem of how to assess group work. The other problem with group work and laptops was that the learning management system was new and teachers had not quite worked out how to have students share documents they were working on in the new system. Some participants thought a 1:1 program would be better because it would allow individual access and would not prevent teachers choosing to set up collaborative work. There was a disconnect between teaching practice and the verbal commitment to collaboration for some participants.

This section discussed finding seven, that the focus on student collaboration was negotiated locally. The next section focuses on how the management of laptops was managed locally.

6.4 Management of the Resources was Negotiated Locally

This section discusses finding eight, that the management of the laptop initiative was negotiated at the local level.

Management, maintenance and storage of the laptops (made available to project schools at a ratio of 1:2 for year seven and eight students) was a locally negotiated enterprise. The project

helped with laptop management strategies and the schools adapted these processes until they found the best way for their context. The schools' different approaches to student ownership and management of the laptops shows the different ways that negotiability of the repertoire was enacted in each of the schools. The project offered suggested approaches, but did not mandate the approaches and allowed flexibility in how the schools implemented the initiatives. It was a beneficial experience for the schools to have the flexibility to try it their own way and also be provided with a recommendation from the project. Schools made these decisions and learned from each other the benefits and disadvantages, from their own or people from other schools' experience.

One of the decisions that schools needed to negotiate locally was the ownership of laptops. Ownership in this sense related to the organisational consideration of whether a trolley of laptops would be allocated to a class, whether subject areas would have a certain number to look after for their use or whether they would be centrally managed resources bookable from the library, for example. There was a general consensus that allocating ownership of the laptops to a class or key learning area (subject) seemed to be the best way to ensure the devices were looked after. Allocating ownership to a class group meant that this group of students was then responsible for ensuring the laptops were accounted for, plugged into power each afternoon and therefore ready for use the next day. The logic behind allocating the management to the class that was using the laptops was that the students would face the direct consequences for misuse of the devices.

There was a consensus that the best method was to allocate each trolley of laptops to a particular class group. There were two main reported benefits in this approach. The first was that there was less damage to the laptops than when trolleys were allocated to subject areas or booked centrally. The second was that the laptop usage was higher. Some examples that demonstrate the

school experiences and decision-making processes are included here. According to Julie, a network-based coach and later assistant principal at Ferny College, there was less damage to laptops when they were initially “based in seven and eight in the home groups with the kids and they lived with that particular home group”. The school then changed the system two years ago to being centrally managed so that “anyone can book them”. Julie explained that the undesired consequence of this locally negotiated decision was that: “The damage has increased in the laptops whereas when they were with the project and the way that we rolled them out there was really no damage at all other than incidental accidents”. Julie concluded that, “The elearning community project ran it much better than what we’ve done as a school since, and we are going to try and convert back to what we did then”. Through experience in trying a new approach but finding that it had unintended consequences, Ferny College was going to change the system back to the project’s suggested way of managing the laptops.

Ben, a network-based coach and later ICT Leader at Ferny College, also supported class ownership of the laptops: “Really successful, especially when the laptops were owned by particular groups of kids”. He also cited less damage as a reason for preference of this structure. He reported that there was “lots of incentive for staff to develop online resources and also develop whole units of work based around the laptops because they knew the kids had access to them”. He continued, “As we had to open up access to everyone, damage rates went up”. Another issue for Ben with central management of laptops was that gaining access could not be guaranteed. The consequence of this was that “Staff, like myself, started to drop back in our use of ICT because you couldn't be guaranteed of having access” (Ben). He reported that “they were still being heavily booked but because you could not guarantee that you were going to have access to them for the three sessions, you have to do a short sharp something”. Ben’s school made the trolleys of

laptops available to all year levels at the end of the project and he described that this had a negative impact on being able to use laptops for a sequence of learning over a few lessons, as access could not be guaranteed.

Celeste, a coach at River College, echoed the sentiments of Julie and Ben in her experience that if the laptops were not “owned” by a group, they were less likely to get looked after. One of the issues she experienced with laptops, was the “lack of ownership in a secondary school by teachers of the laptops, or by the students”. The result, according to Celeste, was that “they get damaged”. She reflected:

In a primary school, you can probably provide a class with a trolley of laptops and the teachers and the students will look after it because it stays with them, but when they change teachers and students all the time, they are prone to get damaged and not looked after as well. I would probably change the ownership of them if I was going to go about it again, but no, fantastic.

Celeste was all for the laptops being “owned” by a specific group or key learning area so they would be looked after, instead of being a centrally bookable resource available to any class.

The experiences of the other schools trying different ways and then deciding the initial suggestion worked best was valuable learning for the group. Red Gum College was able to feel reassured without having to go down the wrong track, so to speak, by Hilary having contact with the other coaches to affirm the choice. Hilary’s school had individual classes own the laptops and had had the opportunity to learn from other schools that had tried central management: “we had it

that way at our school. I know other schools move them around and all that, but I believe they have many more breakages and damage”.

While there was initial problems such as the “wireless not working and being all different across the school and laptops getting broken and who broke it and following all that up, but eventually we got ourselves organised and largely teachers took on using laptops” (Hilary).

French teacher Diane, from Manna Gum College, did interpret the initial introduction of laptops as being imposed from above, but enjoyed using the laptops after initial trepidation:

I was a bit wary about that at first because it seemed to be, you know, imposed upon us, we had to use laptops and I was a bit unsure about just the general management of them before I even started using them in the classroom. Just, you know, unlocking the trolleys and power and how they had to function, and once I'd done that a couple of times and the kids were really great because they'd already done it, they knew what to do, I found it fantastic.

Once Diane worked through the initial learning curve of managing the laptops, she was very enthusiastic about what she could do with them in class:

I really, really enjoyed having them because I would use it, for example, if I wanted to do something with the year nines, they could look up a genuine French website. Or with the little ones, things like there is a program called Languages Online and that is fantastic for, you know, those sort of kids that finish early or just to give them a break, they can do, they are sort of language games, it is on the Education Department website. They can play

language games at their own pace and ... so it sort of made language an enjoyable thing for them.

When the school wanted to move the laptops, Diane was quite used to using them and resisted the move so that they still had ready access to them. She said, "They sort of started to move the laptops out of the library when we said 'No, no, no we want them, we really use them a lot' and so they have left us some so we can still have access to them". This instance shows the development of Diane's alignment with the joint enterprise. However, alignment does not mean "a lack of negotiability" (Wenger, 1998, p. 206). Alignment was in a sense demanded by the project or school in that the use of laptops was "you know, imposed upon us" (Diane). But this demand for alignment could be considered a way of "sharing ownership of meaning" (Wenger, 1998, p. 206). Wenger (1998) cited an example of how this could occur as "a way of demonstrating a possibility and of providing initial guidance in order to hand over control" (p. 206). This was what occurred with this teacher as the ability to "reach new understandings of their own" was demonstrated (Wenger, 1998, p. 206). Wenger (1998) would consider the "negotiability, not authority" (p. 206) to be the key issue in this case.

This study found that the teachers were critical users of the technology. They did not implement it in a reproductive way based on the organisation's mandate. Nor was it the intention of the organisation to implement technology integration in this way. Lewis carefully considered his use of the laptops in terms of teaching and learning value: "The laptop program will be fine, if they are used as tools at the right place at the right time". Lewis did not feel pressure just to use laptops for the sake of using them, just because they were available: "If kids are just expected to sit there all day with laptops open, we are not going to get anywhere, because they'll just slowly work out all the tricks to get around what we want them to do and do what they want to do". For

Lewis, the management was to be negotiated at the classroom level in terms of the use of them with students.

Two teachers, Lewis, from Red Gum College, and Lucy, from Banksia College, saw the benefits of having laptops but also acknowledged the other issues it brought, such as having to make sure students were not playing games on them instead of doing their school work. Lewis was concerned with being able to supervise the students by being able to quickly view all their screens. To mitigate this problem, Lewis planned to set up the English classroom tables “to have the U shape, the horseshoe around the classroom”. He explained that this was so he could “see what’s on the screens”. Lewis’ plan to rearrange the classroom to be able to see students’ screens is an example of negotiating the joint enterprise of using laptops in the classroom. Lewis’ concerns extended beyond his own classroom, presumably because he was taking on the role of English coordinator the following year:

I do have concerns about people mismanaging their classrooms with the laptops, but I can see the usefulness in it. I’m going to be using it when I need to ... But misuse of the laptops has been rife around the school.

At the local level, another example of Lewis’ reification of the joint enterprise to deal with too many games coming in on USB and being played in class was when he would “say to the kids ‘put your work onto your desktop from your USB, get your USB out of there’ and then at the end of the lesson with two minutes to go, ‘okay, everyone put their work back on USB’”. Lewis demonstrated “communicative competence” (Mezirow, 1996, p. 164) in his decision-making “rather than to uncritically act on those of others” (Mezirow, 1997, p. 11).

Students playing games on laptops was a potential problem for teachers Lewis at Red Gum and Lucy at Banksia College. Lucy also found keeping students on task an issue. Overall Lucy was pleased with the laptop program; where there was one laptop between two students, it was “fantastic”. Using the laptops became an expectation from Lucy’s students:

Kids were prepared to work on the laptops and when they were not there, well, some would just point blank refuse to work otherwise, and I’m talking about the harder students, the students that normally lack engagement, but a child that is prepared to work on the computer, on the laptop, may ... just keeping them on task, I guess. Like sometimes they are right into the activity, like I’m thinking specifically about that autobiography—that worked really, really well—but if it is just a research activity ... the kids that do not want to be engaged are inclined to be on games.

It seems if the students were involved in an engaging task, they would use the laptops well. Lucy explained that loosely defined research tasks seem to be the context where students would drift off task and try to play games in class. It was an issue to “see what the kids were actually doing” and she felt like she had to go around and “catch kids”. Similarly, Lewis planned to restructure the room to observe student use of laptops to help keep them on task.

This section has presented finding eight that the management of the laptop initiative was negotiated at the local level. Student ownership over the laptops (one class of students using and caretaking one trolley) was a shared repertoire found to work best to avoid damage to the laptops. Other strategies for management of the student use of laptops were developed locally. The next section focuses on finding nine, that accountability to the enterprise was strong even when the practice was difficult. This is particularly in relation to the project goal to use a learning

management system. Schools approached the implementation in different ways. Although participants showed alignment and accountability to the enterprise, the practice of implementation was difficult.

6.5 Accountability to the Joint Enterprise was Strong

This section addresses finding nine, that accountability to the enterprise was strong even when the practice was difficult. Although there were many positive reports of the use of the learning management system, there were many challenges in getting things running smoothly that impacted the uptake.

Accountability to the enterprise of implementing the learning management system was strong even when the practice was difficult. Whilst the laptops were readily adopted, it was harder for principals and teachers alike to understand the benefits or potential of the learning management system. Discussion about understanding the vision for the learning management system was limited to the project coordinator, a coach and an ICT leader who had worked a short time as a network-based coach. When most people were not able to understand the benefits of the learning management system and had so many difficulties using it, it is not surprising that the use of the learning management system was not a sustainable joint enterprise across all schools in the project. Despite the lack of understanding and all the issues with the system, most participants tried in vain to be accountable to the enterprise.

Emma, the project coordinator, spoke about the implementation of the learning management system being “one of the more challenging parts of the project that we put together”. She explained that this was “because of all of the things we were trying to do, it was probably the

element of the project that the management of the schools understood the least”. The main problem, in her view was that the principals “really did not understand the benefits they were going to get from a learning management system”. The flow-on effect of this, in Emma’s view, was that “it was really hard work for us to filter that down to the classroom teachers”. Emma reported that there was “really good support for the management things for things like the laptop program” but in the case of the learning management system “it was not that they did not support it as much as they just did not understand the potential that it could bring to their schools”. The project coordinator felt it “might have been a little bit premature” to implement a learning management system at the time of the project. However, Emma explained that in the school where the principal and management did understand the benefits, “that is the school where it was the biggest success ... a lot of teachers benefited from using it and are still using it today”.

Hilary, a part-time coach at Red Gum College, also thought it was difficult to convey the concept of the learning management system use to teachers so they could appreciate the benefits:

It was hard to *make* teachers understand the usefulness of it all. It was also hard to learn as a learning coach, because you really needed a class to practise with. I was a little bit fortunate in the end, I got a class because I was a part-time teacher and part-time learning coach, so that made the big difference. (emphasis added)

The learning management system concept was clearly understood by Hilary, who was accountable to the enterprise. The other issue was that it was difficult for coaches to use the learning management system in practice if they were not also teaching classes.

In the words of Ben, network coach and then ICT Leader at Ferny College, the learning management system was “a bit of a disaster”. His observation of the teachers at Ferny College was that “They do not see the benefit in ApprendWeb”. His comment resonated with the project coordinator’s understanding that the principals did not understand the benefits of the learning management system. Ben explained further:

Julie and I followed the guidance of ... you know, bring people along, show them what it can do and, you know, we did that for four years and showed them how to do things and showed them how to do activities, but no one does it. They just do not want to work that way. It has got to be mandated. You have to say, “Right, here is a college system that is going to be used to deliver our college programs. You will use it”. Simple as that.

The uptake of the learning management system seemed to be a slow process. Clara, a teacher at Ferny College, noted that: “I did use it, but probably not as much as I would like. I’m using it more and more”. Ferny College did not mandate the system’s use in the way Red Gum College began to; however, there was still a sense of accountability towards using the system.

Red Gum College had clearly established strong accountability to the enterprise. This was evident in the comments of all the participants from the school. Glenn, the ICT Leader at Red Gum College, was pleased to report that “We are definitely using the learning management system a lot”. He went on to say:

It is still not used as much as I would like to see it used. Next year with our 1:1 netbook program, we are actually spending some time at the start of the year really going through and almost, well, basically insisting that all curriculum is put up onto ApprendWeb.

The fact that the school leadership was willing to mandate the use of the system for putting up the curriculum is a strong indicator of the mutual accountability to the enterprise. Glenn, the ICT Leader at Red Gum College, reported high use of the ApprendWeb system:

Whilst we are still ... the highest user in the elearning community ... I think it will go up even further next year. Once every three months or so, we go through it [learning management system analytics] and have a look at who is using it, which teachers aren't using it, and sort of set up for the learning coaches to target those people and why they are not using it. I mean, obviously there are certain subject areas that are a lot harder to integrate into it and I think that is where, next year with the netbooks being in every classroom, hopefully we'll be able to target those particular subject areas.

The expectation to use the learning management system at Red Gum College was strong. The enterprise was mandated at the school level, indicating the school leadership's commitment to the enterprise. This commitment is evident in reports that Red Gum College had comparatively high usage statistics. Their commitment to the enterprise extended to usage statistics being monitored. Teachers did need to use the system to comply with school policy and were sought out by the coaches if they were not using it.

Jenny, from Red Gum College, had direct access to system usage data. She reported "varying degrees of uptake" of the learning management system. She noted that "on the whole, yes, it is been pretty successful, and I think our school has found ways that it is successful for it".

Jenny reported that:

It has been pretty successful. Teachers use it for basic things. Usually it is putting work up online, attachments, worksheets and that kind of thing, information for students. They have definitely used the messaging. A lot of teachers find that really helpful. There are a couple of little frustrations there with things like the page not refreshing. You cannot see when new messages come in.

Despite the usability issues cited by many participants from other schools, Red Gum College participants placed a large emphasis on success in using the learning management system. The uptake and implementation at Red Gum College was successful.

Hilary, a part-time coach at Red Gum College, remembers remembered that they “took on ApprendWeb as a learning management system at the end of the second year”. Hilary’s view of learning management systems was expressed positively:

I love them. I think they are extraordinarily useful for sharing and collaborating with students and teachers and parents. They are just good management tools. One of the things in ApprendWeb that was extremely useful was that you can go in and see what students have accessed and how long they have spent doing it.

Hilary as a coach and a teacher strongly aligned with the vision and practice of using the learning management system. It was apparent that there was a gap between the vision of its use and the actual practice, a gap that needed a number of things to change to actualise the benefits.

Even with the challenges, Jayne, a science and maths teacher from Red Gum College who worked with Helen, a coach, demonstrated accountability to the enterprise—she had learned the theoretical benefit of the learning management system and felt she should use it more. Jayne said

about ApprendWeb, “I know all about it, but I’m still not using it to the limit that I *should* be using it—I need to brush up on it a bit” (emphasis added). The use of “should” by Jayne is indicative of her accountability to the enterprise. Jayne learned the system and was confident she knew all about it, but felt she needed to “brush up on it” to the level she perceived she should be using it. So she was aware of the push to use the learning management system and that there were perceived organisational benefits such as the ones Hilary was trying to “make the teachers understand”. But barriers to adoption remained.

Jayne’s role as science coordinator meant she was charged to a certain degree with making sure the entire curriculum was on the system. She would have been using the system at a high level compared to many teachers, but as she understood much more about its capability and the vision of how it should be used, she acknowledged the distance between her understanding and her practice:

Being the science coordinator, I had to put most of the curriculum onto the intranet and also organise to do worksheets and student resources, as well as teacher resources, on the intranet, so that we could not only share with each other, the teachers, but also that students should have all the downloaded worksheets and their lessons onto the laptops. That was a huge [amount of] work last year—putting all the resources on the intranet. It was a massive effort by all the teachers, putting all the resources on there. That was really good.

It is clear that there was a planned increase to the commitment to the enterprise from Red Gum College for the following year. Teacher Lewis expressed understanding of this when he commented “next year we’ll be taking that up a lot more seriously. We are going to post a whole

homework program for English on there”. Lewis’ current use was “for getting students to submit their work and to communicate with those students afterwards, as in sending the work back”.

A common theme in the data was difficulty in first using the learning management system but very positive reports once things were working well. Gwen, a teacher librarian from Eucalyptus College, shared:

That has been a slow process. It is been quite difficult at times. There have been times when it has not been working so well. I think it has been this year that it has really bedded down well and people are using it well. I think we are ahead of a lot of other schools with the use of that.

Gwen described the practice of being able to use the system for student assessment and how this made things easier:

Certainly the humanities class I am teaching this year, whatever I put up for them I put up on ApprendWeb and the kids send me their work on ApprendWeb and it is a lot easier. We know a lot more about it now, so we are a lot better at using it.

Aside from the positive reports such as Gwen’s described here, there were also many stories of the difficulties of the learning management system.

For many participants, the implementation of the learning management system was a disappointing experience. The two main problems with the learning management system were having incorrect data in the system and that the system was not intuitive. Despite these difficulties, participants still demonstrated accountability to the enterprise in their desire to persist

with the system. The main issues are described here. The first issue of learning management system implementation was having it populated with accurate and up-to-date data. Four participants reported this to be a problem at their three schools. Robert, a coach at Banksia College, contended that the major issue was “keeping the data accurate, keeping the classes accurate”. He admitted, “We never, ever got on top of it despite a lot of efforts. Teachers stopped using it because it was never right”. Lucy, a teacher at Robert’s school, Banksia College, experienced this problem first-hand: “I think every student has to be invited into your class before you can actually send them things. Then with changes to classes the rolls ... so probably a smoother operation of integrating students into the system”. Lucy did not seem quite clear about what the problem was and how to get the right student appearing in her class. She seemed to be using a work-around to try to get students into her class by “inviting” them.

Another issue was the usability of the system. This did improve over time, according to some participants. Robert, a coach at Banksia College, perceived another problem to be that “it was clunky, but you could still use it, and then it got better and better in that regard, and far more useable”. When asked by the researcher how he would change the learning management system to make it better, Robert replied, “Well, it needs to be less clicks. There are too many clicks”. Lucy, a teacher at Banksia College, did not find the system easy to use:

I have hardly used it at all. I would say that it is, to my knowledge, not used within the school very much. You know, teething problems and all sorts of other stuff, and it has not given me confidence to use it. If I want kids to actually access a worksheet, it will be placed on the school’s intranet system rather than through ApprendWeb.

At Banksia College, even when initial technical issues were resolved and data integration had improved, teachers still faced the problem of lack of usability of the system. Trying to use the system left Lucy feeling bewildered: “Every time I go in there, it is not clear. Where do I go? What do I do next to access it?”

Another teacher from Banksia College, Carmel, tried to couch her response about the learning management system in positive terms, but it was clear the system had just not worked for her: “ApprendWeb, kind of it worked to a certain extent, but I do not think we ever got it to the point where it worked really well”. Her willingness and investment in the enterprise are evident: “I did persevere and it did take a bit of time”. Unfortunately, Carmel earnestly tried to use the learning management system, invested time in it, but ultimately did not get anything out of it: “I’d try and use it, but I did encounter difficulties. I really stepped away from it this year”. After what seems to be a major admission she was scratching her head as if she was still trying to find something positive to say about the system even though we had moved onto the next question. Carmel quickly added, “Just having the right class lists helped a lot”. Robert, the coach at Banksia College, was less apologetic and frankly stated, “Our school is not using it next year. We’ve decided to give it the flick”. Banksia College decided to discontinue with the learning management system after the project funding for it ceased.

The mutual accountability to the use of the system was demonstrated by Tanya’s perceived need to “remember to use it” and her acknowledgement and personification of the system having “a lot of positive qualities and traits”. Tanya, a coach and teacher from Manna Gum College, did demonstrate accountability to the idea of promoting its use, as this was part of the joint enterprise committed to, even if she was not actually doing this largely in practice. Early difficulties with the system experienced by some teachers led to them not coming back to try

again, but again a strong sense of accountability to the enterprise was demonstrated in that there was still an intention or a sense of obligation to make this happen. Michael, a teacher from Manna Gum College, was one of these teachers and explained this as follows: “I have used it, but not extensively yet. I have not got the materials for that one there, as I would like, but I’m hoping to next year”. Michael reiterated that he had not used the system extensively “yet”. Michael indicated his positive attitude towards adopting technologies. The barrier, however, seemed to be ease of use for him. Considering that Michael had used high-level technologies such as GPD tracking and had presented webinars for other teachers, this indicates that he did have the level of skill and ability to learn the technology.

Even though the initial problems reported by William, a part-time humanities teacher and part-time coach from Manna Gum College, as “a number of issues with it on the servers, for a start” had been resolved, there were other issues that impacted teachers’ future uptake of the system. For him, “ApprendWeb was a little bit disappointing”. Issues with the system went beyond initial setup problems. Not having correct data in the system was a problem at Manna Gum College, as indicated by Tanya, who explained that “getting the database right was quite a challenge”. The consequence of this not being right meant “a lot of teachers kind of felt there was no point putting work up, which I was among them too” (Tanya). Once the school had sorted out the technical setup, there was still problems with usability of the system. Usability was a problem for Michael, a teacher from Manna Gum:

To make it better, that is probably why I did not use it very much. It would be easier to have a more windows-based, drag and drop, with folders and documents and things like that. Too many processes just to get one document on there and to know where it is and be

able to find it. I find it difficult to see what you have put up there versus what kids have sent you, so there would need to be two separate folders for that.

William reported that the school did persist with the use of ApprendWeb and the system did seem to work better eventually: “It is far better than it was. I think with the organisation and the layout, and I think because of that, it is being used far more”. However, although Tanya and Michael, they expressed strong accountability to the enterprise, both indicated that their usage was not extensive.

The other point Tanya identified here is that the usage was not as high as it could have been because the project coaches were not available to assist teachers with the use of the system by the time it was working better:

It is been interesting seeing its usage this year when we have not had, an elearning coach, not to the same extent. I really like it in a lot of ways but it is, there is always that time period of, there is some new students coming in and the data is not right and therefore you cannot use it with your kids.

To the researcher’s knowledge, Manna Gum College appointed a teacher who had not been a coach in the program to provide assistance to teachers with the system after the formal program ceased, and this is what Tanya was referring to with her comment that they “had an elearning coach but not to the same extent”. The teacher appointed would not have had the same release time from teaching duties that the coaches had under the project funding arrangement.

Peter, a part-time teacher and part-time coach at Wattle College, also reported “some issues with it in terms of rolling over of classes”. Jim, also a coach and the ICT Leader from

Wattle College, expressed that “ApprendWeb for us has been a bit of a disappointment”; the reason for this is that it was not “particularly intuitive”. Peter explained, “It was difficult. Just to upload a piece of work for a student was cumbersome, and that turned some staff off. It was not as simple as just click, point and upload”. The fact that these issues put staff off seem to have a big impact in that they were less likely to try to use the system again. Jenny, a part-time coach at Red Gum College, also reported the problematic usability of the system: “Interestingly, it looks very simple at face value, but it is actually often a bit difficult to navigate your way around. Buttons just are not where you expect”. Usability was a major hindrance to use of the system during the initial rollout.

Celeste, a coach from River College, reported that the learning management system was a “great concept” but “was not a success in our school”. She identified two main issues; the inadequate infrastructure and change management:

Part of it was because the infrastructure was not adequate. And also probably the change management process, we struggled a bit. But I think if the infrastructure is not there, the teachers just get sick of it and stop using it because it keeps letting them down.

An adequate level of technical and administrative support is needed to get the data in a learning management system correct.

After speaking about ApprendWeb as being a “bit clunky”, Celeste was still generous to the vision of the enterprise, offering that “maybe as their [teachers’] skills come up, that will be less of an issue”. Celeste still supported the vision of the learning management system:

But I think the concept is the way of the future, using an online learning platform or learning management system. Universities have been doing it for a long time and secondary schools have been way behind, really, and probably primary schools too. I cannot see how we cannot go down that pathway.

Celeste demonstrated accountability to the broader enterprise of technology, in getting up to speed with the way of the future.

At Wattle College, there was promotion of using the new learning management system during the project. Yvonne said:

It was pushed when I did elearning coordination. We made sure teachers were using it, but since I have stopped doing elearning, there has been no, I am not saying it has been anyone's fault, but there has been no importance on that, because we use a different system that Jim set up that is fantastic, so there is no need.

There was a tension in introducing ApprendWeb at Wattle College because the school was already using a system it was happy with. The accountability to use the new system disappeared with the end of the project. Peter, a part-time teacher and part-time coach at Wattle College, was at the same school but at a different campus to Yvonne and Jim. Peter's report is contrary to Yvonne's:

We spent a lot of time training staff here to use ApprendWeb and to make sure that they were happy with doing it, so lots of in-servicing done, a lot of the training done for people, showing them how all the bits work. And then staff went away and played with it and practised it. They actually came up with some uses for it from there as well. They still use

some of the messaging system so you can talk to each other. In class, if for instance, I have a student who is being disruptive and they want to send someone out, they can do that.

Peter reported a high usage of “80% to 85% take-up on people wanting to, interested in and wanting to use ApprendWeb because they see the value in it”. There may have been variation in use at different times and also variation in use across the school’s campuses.

Three coaches expressed disappointment that the system for sharing and communicating between the schools online did not eventuate. Ben, a network-based coach and later ICT Leader at Ferny College, reflected on this:

It certainly would have been more effective and more rewarding if we had had greater scope to talk to other schools more, even within the elearning community. Remember, we initially wanted to have that central portal where people can share resources across the schools. That did not happen and that by far is the biggest disappointment. You know, the chance to have all those resources and have a real community happening.

For Jim, a coach and ICT Leader from Wattle College, it was “a disappointment that it did not allow us to share in the way we had hoped, and that was one of the original big things”. My understanding is that Jim was hoping for a virtual private network (VPN) that would link the schools online for the seven schools to share, but that never eventuated. William, a part-time humanities teacher and part-time coach from Manna Gum College, also expressed that he was “really disappointed ... that the virtual network didn’t get up”. Jim, William and Ben had “imagined” (Wenger, 1998) the possibilities for a VPN that were not realised in the project. This

imagination demonstrates the participants' ability to see possibilities that in this case were not realised.

Overall, many problems were reported with the learning management system, but participants still demonstrated an accountability to the enterprise in maintaining their aspiration to use it. Their comments about not using it as much as they should or would like to and promises that this would increase show their accountability to the enterprise even against all odds, with the system not being set up well or being user friendly. The ease of use of a system is a contributing factor to whether teachers can get benefits out of using the system. ApprendWeb, even after initial access difficulties were resolved, still seemed to need "too many clicks" to do things.

This section has discussed finding nine and highlighted the accountability to the enterprise regardless of the multiple challenges with using the learning management system.

6.6 Conclusion

The use of technology was new to many teachers at the time. The infrastructure and technical support needed work and implementation of a learning management system may have been premature and ambitious. There were many problems with implementing the learning management system in the schools. It was early days for these systems at the time of the project in 2005. Another problem in making it useful for teachers was getting the data fed into the system correctly. If students were not correctly allocated to the right class, then this was problematic for teachers because new students did not have access to the materials posted for the class. Then there were problems with the system itself, including how many clicks it took to do something. Another issue was that students had access to one laptop between two students, so using a single-user sign-

on system was problematic. Many teachers were able to post work and some were able to use it to communicate with students and other teachers. The analysis indicates most participants were positive about the concept even where the practice had been too difficult to reach the vision of what they would like to have achieved with the system.

Some participants from some schools saw the implementation as a school-based activity and viewed “the project” and other schools as resources to obtain support from. That is not to say they were not engaged with the practice of the community—this is just one aspect of the “complexity of mutual engagement” in negotiating a joint enterprise (Wenger, 1998, p 77). A community vision has to be enacted in a local context, and the coaches and teachers were charged with how this actually happened in practice. The project proposal did not make specific mention of Fullan’s (1994) top-down bottom-up methodology for approaching change. The project at the proposal stage could be considered a top-down implementation, but with a strong focus on collaboration and sharing to meet the goals. The Leading Schools Fund proposal stipulated that each school be committed to the project goals by inclusion in all policy, job selection criteria and teacher performance plans (*Leading Schools Fund Proposal*, 2004). The later theoretical positioning of the project as top-down and bottom-up developed through the practice of collaborating at the principal, leadership and teacher levels.

In this chapter, an analysis has been provided on how technology integration practices developed as shared repertoires at the local level in two major initiatives; namely, the laptop program and the learning management system. In the next chapter, the multi-tiered professional learning program is discussed.

Chapter 7 Findings and Discussion – Professional Learning

This chapter focuses on the elearning community’s approach to professional learning in integrating technology into the curriculum, as an element of its innovation agenda. The multi-tiered professional learning approach, which included workshops and coaching that supported teachers in integrating technology into the curriculum is detailed here. The focus is research question three, how do teachers and coaches working to integrate technology into the curriculum experience professional learning within a network context? The overarching finding presented is that teachers and coaches experienced a multi-tiered approach to professional learning in integrating technology into the curriculum across a network of schools. Table 11 depicts how this chapter is structured around findings 10 to 14.

Table 11. Research Question 3, Overarching Finding 3 and Findings 10–14

| Research question 3: How do teachers and coaches working to integrate technology into the curriculum experience professional learning within a network context? | | | | |
|---|---|--|---|--|
| Overarching finding 3: Teachers and coaches experienced a multi-tiered approach to professional learning in integrating technology into the curriculum across a network of schools. | | | | |
| Finding 10: A multi-tiered professional learning approach supported the aims of the project and provided flexible opportunities for teachers. | Finding 11: Formal professional development provided the opportunity for pedagogy-focused technology learning and networking. | Finding 12: Coaching was a situated method of professional learning in integrating technology and was tailored to the teachers’ needs. | Finding 13: Collegial professional learning supported teacher practice in integrating technology. | Finding 14: Collaborative projects were a form of professional learning for teachers in working across schools and with outside experts to facilitate authentic learning for students. |

The next section focuses on finding 10, that a multi-tiered professional learning approach in integrating technology into the curriculum supported the aims of the project and provided flexible opportunities for teachers. It provides a snapshot of the culmination of the approaches that provided opportunities for teachers to engage in professional learning in the integration of technology. The approach to professional learning is depicted as a multi-tiered professional learning model in Figure 19 in section 7.1. The subsequent findings offer details of the processes and practices of the elements of the multi-tiered professional learning structure: formal professional learning, informal coaching, informal collegial learning and collaborative projects.

7.1 Multi-Tiered Professional Learning Approach

This section describes the multi-tiered professional learning model that developed during the elearning community project. The multi-tiered professional learning program included workshops and coaches available to work with as a follow-up to formal sessions and for in-classroom support to implement ideas.

One of the goals for the elearning project was to provide support to teachers in integrating technology into the curriculum. The project proposal articulated this in “Goal 3: To deliver quality teaching and professional development in all learning areas” (DET, 2004, p. 11). The top-down nature of the project is expressed in the needs identification statement that “Every teacher must be supported and included in this professional learning, recognising that ICT is a professional obligation for teachers, not optional” (DET, 2004, p. 7). The bottom-up approach to the initiative that included “a system of shared coaches” reposed in Goal 3 in the aim to “to enable staff to further develop their own computer and information literacy skills and to use those

skills to develop new teaching and learning methodologies” (DET, 2004, p. 11). In this way, the approach to professional learning in the project was both top-down and bottom-up.

Professional development was described as the most significant aspect of the project. The professional learning strategy was instrumental in bringing together coaches and teachers from the seven schools. Hilary, a part-time coach at Red Gum College, stated, “professional development is absolutely critical”. Participants in the study indicated this was a new model of professional learning and something they considered an essential aspect of the project that was successful. Sylvia, a network-based coach, described it in this way: “We had a whole different model of professional learning” and “we did it quite comprehensively”. It became a common understanding that the professional development approach was more than one-off workshops, as expressed by one coach that there are “lots of different aspects of professional development” (Celeste).

Many participants made a distinction between “formal” professional development (group sessions) and “informal” professional development (one-on-one, just-in-time, learning from colleagues, working with coaches in and out of class) in the interviews. The shared language of formal and informal professional development was part of the shared repertoire of the elearning community. The terms formal and informal to refer to professional development were utilised in the three level approach to professional development (Figure 22) introduced at the community’s conference (discussed in section 7.2.2). However, these terms were not exclusive to the community. There are instances of this categorisation in the literature (Cooke-Nieves, 2011; Khalid et al., 2013); however, it seems generally not to be the preferred language of academics. The three level approach also included the term “chainmail” professional development (as represented in the professional development model presented in the keynote address at the

community conference, see Figure 22) was not used in the interviews, but the practice of sharing new knowledge with colleagues was expressed with high frequency. Therefore, the term “collegial professional learning” is used in this study. This type of learning is sometimes referred to as “cascade professional learning” but that term does not include mutual learning, only the passing on of ideas. Both kinds of exchange were identified in the data, so “collegial professional learning” is used.

The project coordinator, Emma, reflected on the changes that occurred through the professional learning strategy:

You see huge benefits of that now. The teachers from the elearning community in lots of ways came from a position where, in fact, especially in some of the outer schools, they had very few opportunities for professional development, to now probably having some of the best ICT skills in the state. They might still not have the best equipment, but they certainly have been exposed to new ideas, new strategies and new ways of doing things that were a direct result of what we did in the project.

Sylvia, a network-based coach, shared:

Professional development is probably one of the things that we did the best. Perhaps we bit off more than we could chew in year one. I think we did things out of order like for example my WebQuest would have been better in third year once people had some grounding in it. The turnout we got for our term two programs that we did every year was astronomical. The professional learning program worked very well and in every model that you can put forward. We had just-in-time learning with people, we had one-to-one

mentoring in the classroom. We had organised workshop sessions, we had conference sessions.

Particularly important for Sylvia was the different expertise that was offered by different coaches:

Having people who presented in different ways, we catered for a lot of different learning styles as well. There was a big difference between the way I deliver it and the way [another network-based coach] delivered it and the way you or Emma [delivered it].

Julie, a network-based coach, described the formal professional learning program where workshops were held at different schools on different days over a four-week period:

We ran and developed professional development sessions across the seven schools, as well as individualising those PD for staff where needed. We ran regular PDs weekly as well as a term series of PDs where I might run one at River College and staff from the seven schools came. Pennie might have run one at Ferny College, Sylvia might have run one at Wattle College and staff from the seven schools collaborated across around the project.

The professional development sessions were run at different locations, but staff from all seven schools were invited to attend at any location. In this way maximum flexibility in locations and days was accommodated.

Peter, a part-time teacher and part-time coach at Wattle College, described how the professional learning program changed over time to accommodate where staff were at and meet their current needs:

I was mainly involved in providing professional development. There were both the programs run through the elearning community for events, the seven schools that we were involved in. Then there were the ones that Jim and I ran internally as well. We were producing one or two internal in-services a week for an entire period on a whole range of subjects. We started up doing things we knew we needed to do, so introducing ApprendWeb, some of the things that we wanted, the basic stuff to put out for all the English teachers ... We got to a point where the major tasks had been done, and so we opened it up to tell us what you want and somebody would say “I need to be in-serviced in using Photoshop” so I would run a Photoshop in-service for the staff, whoever wanted to turn up. You might have one person, you might have 10 people there. It depends on the range of subject areas.

A number of coaches reported that they tailored the professional development workshops to the needs of the staff in their schools.

Teachers could also work individually in their own school, with coaches and network-based coaches who were available full-time for a three-year period, to work with them to integrate technology. Celeste, a coach at River College, talked about the professional learning which was offered in many locations and available to staff at all seven schools:

We would move around and run coordinated things in different schools. A major part of the elearning coach’s role was providing professional development in a number of different ways. That was formal, the staff after school, but the coaching was professional learning too.

Celeste points out here that the “coaching was professional learning too”. This indicates that this aspect of the program was considered a new form of professional learning for the community. This way of distinguishing the types of professional development is evidenced in the data as a shared repertoire in the community and an indicator that a cluster community was operating. The informal professional development, such as having coaches available to come to class with teachers, helped to address the barrier of the teacher having to be away from their classes (see section 7.3).

The project coordinator explained that an important part of the way professional learning was structured was that after teachers had attended a workshop:

when they went back to the school the next day, there was someone there at the school who could actually help them with it ... The network-based coach who had run the session would come to the school and work with them, or the learning coach in their own school would sit down and actually work with them as they thought through how it actually was going to work in their own classroom.

Being able to work with coaches one-on-one and have in-classroom support after professional development workshops meant teachers could implement the ideas that they had been exposed to in the sessions. Teachers having access to in-classroom support and many opportunities to be supported in how they wanted to implement technology was perceived as the biggest win of the project.

Teachers also had many opportunities to collaborate with each other. They learned through collegial (or cascade) professional learning by sharing with another teacher. The cascade

model (although it was not known by this name) is the part that was hardest to track the success of or see the evidence for. Many coaches ran workshops in their respective schools. Celeste, a coach at River College, recollected that she “used to run professional development at the school after school hours regularly”. Aside from providing “for the staff at the school”, she mentioned that “as a project group we used to run it”.

The original three-level approach described in section 7.2.2 has been recast as a multi-tiered professional learning model with four components instead of three, and the terminology to describe it has been revised based on synthesis of the data.

| | |
|---|--|
| Formal Professional Learning (Cluster Focus) | workshops |
| | short courses |
| | conferences |
| | professional learning days |
| Informal Professional Learning (School Level Focus) | coaching – planning a lesson together |
| | modelling a lesson |
| | just-in-time |
| | co-teaching |
| Collegial Professional Learning (Within and across schools) | email list for coaches |
| | teachers sharing with other teachers |
| | people with like roles coming together from different schools |
| Collaborative Projects (Within, across and beyond schools) | collaborative projects across schools and with outside experts |

Figure 19. Multi-Tiered Professional Learning Approach

This section has described the overall approach to professional learning in the elearning community. The next section focuses more closely on the formal professional learning that took place and illustrates teacher experiences of the professional learning approach in two vignettes aimed at showing the connections between the opportunities available in the community through the coaches of the project.

7.2 Formal Professional Development

This section focuses on the formal professional development programs, such as workshops, professional development days and conferences, and the Intel 40-hr course, that were made available to teachers across the seven schools. The 11th finding provides a focus on the formally structured professional learning, such as workshops that provided the opportunity for pedagogy-focused learning and networking. The formal professional development experiences were effective when considered in the context of a situated multi-tiered program.

The formal professional development in the project took the shape of workshops, professional development days and conferences. The project explicitly agreed that the formal offerings were a shift from traditional software-based professional development in that they were “hands-on” practical professional development that included examples of how ICT could be integrated into the curriculum. Sylvia, a network-based coach, thought “one of the most powerful things that we did” was the guideline of running professional development which was “hands-on and something you can use in your next class”. This prevented “getting bogged down in software” and contributed “two very important things that make a good professional learning”. These sessions put the pedagogy before the technology (McGrail, 2007); software skills were taught, but the focus was on how to incorporate it into the curriculum. The project team consistently worked

to make the focus of the workshops modelling collaborative and student-centred pedagogy, before the technology as a secondary focus. This focus of the workshops helped teachers integrate technology into their classrooms because the aim of every session was that it covered something teachers could put into practice immediately.

7.2.1 Workshops

All teachers from the seven schools had access to focused workshops, which were an effective method of professional development for the integration of technology due to the networking opportunities and because follow-up with coaches was available. Formal offerings included hands-on workshops in term two of each year run by the network-based coaches. Four sessions were held at four different times and in four locations. This gave teachers maximum opportunity to attend. The session titles for the year 2005 were Using your Laptop in the Classroom, Reusable Learning Objects, PowerPoint as a Teaching Tool, and Using WebQuests. The titles for the workshops in 2006 were Learning with Image and Sound, Integrated Online Assignments, Marking Online Work and Rubrics for Student Success. There was also a series of workshops run by the school-based coaches offered to all schools in 2007. About 250 teachers attended the workshop series each year in 2005 and 2006. The attendance figures in 2007 increased to 280. The total population of teachers was around 700. Calculating a percentage figure for the numbers of teachers who attended would not be accurate as some teachers attended more than one workshop.

After-school workshops were held at a number of schools and repeated on different days and in different locations to maximise the ability of teachers to attend. Project Coordinator Emma explained that the workshops “were run at different locations and at different times so people

could choose where they wanted to do it. It was not just in their own school, they could go to another school and do it at a different time”. She reported that “they were really well attended”, partly “because the principals said that their teachers had to attend at least one, but not in all cases”. Network-based coaches ran the sessions in the first and second years, and coaches presented workshops offered to all schools in the third year.

Student-centred learning was modelled in the workshop sessions. The project coordinator banned talking for more than ten minutes at the start of a workshop, which was easier for some presenters than others. Rubrics were showing up in assignments where they had not been before (Keynote presentation notes, 2006, unpublished). The use of rubrics was mentioned specifically by three teachers during the interviews: Jayne, a science and maths teacher from Red Gum College, Lucy, an English and humanities teacher from Banksia College and Clara, a maths teacher from Ferny College. Rubrics were required to be developed for the student tasks for the Intel program and one of the workshops given in term two was on this topic.

Teachers acknowledged the quantity and quality of the PD offered through the elearning community. Clara, from Ferny College, recalled that she did the “collaborative projects” workshop as well as professional development on “ApprendWeb and Day Map”. Lucy, a teacher from Banksia College, found the “clickable worksheets workshop most useful”. Lewis, a teacher from Red Gum College, commented: “In the last couple of years everyone’s skills have improved thanks to elearning community PDs”. Glenn, ICT leader at Red Gum College, attended “lots of professional development through the elearning community”. He attributed his involvement in the web 2.0 pilot project to his “involvement in the elearning community”. For Maria, an English and humanities teacher at Eucalyptus College, the main benefit was “professional development in lots

of areas that I lacked confidence in, or I did not have the experience with”. Some very successful collaborative projects were facilitated across the schools (see section 7.5).

Carolyn, an English and humanities teacher from River College, “did heaps of professional development because Celeste [the school-based coach] was offering things after school on a regular basis, and the network-based coaches were offering things as well”. Carolyn explained:

I went to hours and hours of professional development, and it was really beneficial. I encouraged other people to go as well. Then we were able to talk about what you had learned and put it into practice. We had projects happening across the curriculum a little bit.

Here Carolyn talked about encouraging other teachers to go to the professional development so they were able to talk about it afterwards. She showed that she valued teacher collegiality as an aspect of the way she learned. Professional learning was seen as a community effort in the way it was offered.

Jayne, a science and maths teacher from Red Gum College, also acknowledged that the elearning community professional development sessions helped:

When I started at this school, there was a lot of support and help from everyone around the elearning community group, and that was really great. I learned a lot, and there were so many people helping in regards to PowerPoint, to WebQuests, to ApprendWeb and all those sorts of things. That was really good for me.

Jayne participated in most of the professional learning offerings during the elearning community project.

The community-based workshops were appreciated by coaches and the staff at their schools. William, a part-time coach and teacher at Manna Gum College, spoke about the response at the school to the community-based workshops:

I liked the sessions where you would have one every half year, or one every term or whatever, where you had to visit other schools and the coaches and the [network-based coaches] were giving topics, so that worked well. I liked that, and I liked the conferences too, that drew people in and gave a whole range of material for teachers to think about.

The workshops and conferences “drew people in and gave a whole range of material for teachers to think about”. This shows how the community-based workshops were an opportunity to spread the message of the common purpose and provided artifacts that could be used for new practices. This is one way a shared repertoire spread through the schools. William expressed that it was a “rewarding” experience for him and the teachers attending the community-based professional development (PD) workshops: “The PD was rewarding for me to do it, and it was rewarding for the people who went along and experienced the elearning community PDs at school”.

An important spin-off from the community-based workshops was that one school in particular started to run its own workshops. The two examples given here by two coaches at Manna Gum College demonstrate that these workshops were run not only by the coaches in the school, but also by teachers. William talked about how staff that had attended professional development then started to run it within the school for other staff:

Now a number of the people who started doing stuff under the elearning community are giving their own little PD sessions at school ... The people who have taken on board the technology have decided to pass that onto other people. Some of the things that they are doing are quite innovative. [An English teacher from our school] is using blogs in English. She really dives right into it and is using it well.

Tanya also explained that teacher-run professional development occurred twice a term at the school: "At Manna Gum College we have, twice a term after school we have PD week, so teachers deliver sessions to staff and we share our knowledge". She described some of the kinds of session she offered:

As part of that I have delivered sessions on ApprendWeb, I have delivered sessions on using PowerPoint as a teaching tool, on creating interactive quizzes, on a whole range of different things that have been a lot of fun, and on animation, which was heaps of fun.

The sessions Tanya offered were similar to the community-based workshop topics. This shows that the community-based workshops provided a model for running workshops in the schools. The coaches being able to run similar offerings meant further opportunity for teacher engagement on-site. The development of teacher-run workshops at Manna Gum College is important because this method of organising workshops is low cost and recognises the expertise already present in teachers within the school. Teacher-run workshops were a sustainable development. Teachers from other schools were still invited to these workshops two years after the formal program ended, indicating some sustainability. Two years later, however, the workshops were still running at Manna Gum College but the extension to the whole community was no longer happening.

As mentioned by Wenger (1998), people coming together from different organisations is an opportunity to create a community “among people who might not have otherwise had the opportunity to meet” (p. 250). Wenger also posited that “ the exchange of experience may well end up being more significant than the content of any instructional program (Wenger, 1998, p. 250). The data suggests that the networking and “exchange of experience” was significant for the participants in this study. Further to this, the workshops provided an opportunity for the common purpose and ways of talking about things in the community to be reiterated.

The following illustration of practice shows some of the elements of the multi-tiered professional learning model and the flow-on effect in relation to how this worked.

| |
|---|
| Illustration of Practice 1. WebQuests as a shared repertoire. |
|---|

Formal professional learning sessions combined with one-on-one curriculum development support and in-classroom support meant success for teachers in integrating technology in the curriculum. One of the sessions offered during the annual term two professional development (PD) series was on WebQuests, a curriculum concept developed by Bernie Dodge and Tom March (Dodge, 2015; March, 2008). WebQuests is a collaborative inquiry project format that promotes higher level thinking (March, 2008).

This illustration of practice involves Clara, a teacher at Ferny College, who attended one of the professional learning sessions on WebQuests and “discovered that there are not many good maths WebQuests”. This led her to think about making her own: “I have made a few since and probably the best one was the Schoolyard Blitz”. Clara worked with the researcher (during the

project period when the researcher was a network-based coach) to design and implement a WebQuest:

The PD was the main way that we have actually sort of been right in contact with other people. I collaborated with Pennie as part of the collaborative projects and we worked on Schoolyard Blitz together.

Clara wanted to design a WebQuest to develop year seven students' skills in measurement. Clara described the WebQuest project:

The students were asked to design an area. We had a new deck built for our portables and it was a pretty vacant area, and their task was to beautify and make it a more useable space. They had a hundred thousand allocated and they had to research how they wanted to develop the project. They did that in groups and were assigned roles. Then they had to present their findings to the group as a PowerPoint.

During our one-on-one coaching session, I had demonstrated Google SketchUp to Clara to see if it would be useful for the students to have to make a 3D model of their design using the software. She agreed. Clara came up with a list of websites with furniture prices to include in the WebQuest to scaffold the project so students could "find all the information that they needed" and to "just to cut down on the amount of time wasted looking for un-useful sites".

I was able to come to the classes to help get things started, but only needed to attend a couple of times before Clara had the confidence to run the project herself. She was amused when the students thought the authentic learning project was actually real:

A lot of the students thought it was real and that they were actually going to win a hundred thousand dollars. But you know, once they got over that, they were very excited, they, you know, every maths class they enjoyed, you know, they were, some of them got a bit side-tracked with their ideas. They were not probably very realistic. I suppose that is also a problem with group work, you know, getting them all participating as well as, was a bit of a problem at times, but they were very engaged and motivated, which I think sort of extended throughout the rest of the year then, so it was well worthwhile.

Clara talked about how much the students enjoyed the project and that they were very engaged even if they sometimes got carried away with their ideas. Some students designed a skate ramp for the decked area between classrooms! Other had more realistic concepts, as depicted in Figure 20.



Figure 20. Student Design Resulting From the SchoolyardBliz WebQuest for Year Seven Measurement

Clara also embedded her learning in future practice and shared the curriculum she developed with other teachers. As elaborated in the next excerpt, Clara went on to adapt the WebQuest concept:

Doing the Schoolyard Blitz opened up my options setting assignment work for the future. I was more open to trying new things. I did an Olympics WebQuest. It was not officially a WebQuest—it may not have met all the criteria—but it was still a way for students to learn other than just typing up a project sheet and doing the traditional way of setting tests or whatever of statistics. It has broadened the way I assess and made it more interesting. I have also used rubrics more as a result of it, so it is having a long-term effect. I am more willing to try something new and not be too scared by technology.

Clara had the ability to renegotiate the repertoire. In terms of membership, Wenger (1998) phrased this as “negotiability of the repertoire” (p. 137).

Clara then shared what she had developed with the other maths teachers: “I made the Schoolyard Blitz available via ApprendWeb to all the maths staff, as a year 10 teacher, the Olympic WebQuest I have made available to the other year 10 teachers”. She expanded her classroom and assessment practices in maths. The way Clara adapted the concept can be considered a reification and a negotiation of the practice (Wenger, 1998). Where the WebQuest was developed, this is an example of a locally produced repertoire, indicating “a higher level of engagement” (p. 126). Clara and I entered the Education Channel and School Library Association of Victoria (SLAV) WebQuests and beyond competition in 2008 and won a Smartboard for the school. We also presented this at the Eastern Metropolitan Region Maths Conference in 2008. I then presented this in a webinar to a wider audience of DET teachers. This is just one example of the flow-on effects of the project and how practices were shared with the broader landscape even after the project was finished.

Sylvia was the network-based coach who had run the initial session on WebQuests. Here she described the role as mainly working with teachers to support them to plan and implement their projects:

We did a lot of projects with teachers who needed support in the planning or implementation of their projects. Things like working on the totem pole WebQuest with [a teacher] at [Manna Gum College] and running ongoing trainings like working with teachers who are developing curriculum. They became collaborative projects as well and different styles of collaboration like team presenting, presenting as a team in the elearning community staff, and we did keynote things together and things like that.

Sylvia also followed up after group professional learning with teachers to implement the concept into their curriculum. Jayne, a science and maths teacher from Red Gum College, remembering that, noted “she taught all about WebQuests. That was really great, and helped me a great deal”.

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| <p>Illustration of Practice 2. Digital Storytelling Curriculum Within and Beyond the Network</p> |
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Lucy, a teacher from Banksia College, described working on a digital storytelling unit using Photo Story that she and I worked on together when I was a network-based coach in the project:

One of the best things about it was when I collaborated with you with my year seven class and we did a unit on autobiography. They got to bring in photos from home or take photos of objects that were important to them and make a Photo Story, which they then recorded

audio onto and played it to class. That was a really positive activity that was received well by the students. It was fun to do and I would not have had the confidence to do it without there being a coach there, or even the knowledge of what Photo Story was.

Lucy was able to come to me as an available coach with a curriculum idea that she would like assistance in integrating technology with, and we were able to work together to make it happen. She explained that she would not have known what Photo Story was and this was a link the researcher, as a coach (or network-based coach), was able to provide. Photo Story as a technology is simple-to-use software with wizard functionality (menus offer step-by-step instruction), so widespread adoption of it occurred; and has the final production built into the wizard. The researcher, in her role as a network-based coach, was able to give the in-class assistance, which enabled Lucy to have the confidence to run it when she otherwise would not have done so.

The curriculum developed by the researcher and Lucy formed part of the curriculum samples for workshops on digital storytelling, which were later picked up by other teachers across the network; digital storytelling became a shared practice across all learning areas. Tanya and the researcher presented this work at the Victorian Association of Teachers of English (VATE) state conference and had emails from other school networks asking us to share this curriculum with them. Tanya and I co-presented a number of times on the digital storytelling across the curriculum topic. She talked about sharing with others by presenting workshop sessions:

It was a superb session on Photo Story and digital narratives, and how you can enrich curriculum through those. It is been a great opportunity for me to share my knowledge ... Also all the one-day ones, like the laptop[s for learning]. We did so many PDs that I lose track.

Jayne, a science and maths teacher from Red Gum College, indicated that the shared practice of digital stories was adopted into the science curriculum in her class: “I did a PD on Photo Story this year and some of my students in year eight incorporated that in their projects, that was good too”. She demonstrated a transformational use of technology by allowing student choice in how they presented their projects. This also demonstrates that the comfort level for Jayne was sufficient for her to allow her students to choose their own medium of presentation instead of prescribing the format.

These illustrations of practice demonstrate some of the ways teachers engaged in the different forms of professional learning, including the workshops. In the flow of processes in Figure 21, the steps can be entered or exited at any step. The impact of this model was multiplied through the network because more than one teacher and one coach were working together in a similar way. The entry point and exit points were different for different teachers. Some worked with coaches without attending the workshops. Other teachers may have begun work directly with a coach but may not have passed on their knowledge to other teachers.



Figure 21. The Flow-on Effect of Workshops With Coaching Support

This section has presented a discussion of the professional learning workshops that occurred in the project schools and illustrated the flow-on effects possible with follow-up support.

7.2.2 Professional development days and a conference

A number of whole-day professional development sessions were offered. The first was a project launch held on 4 December 2004 just prior to the official start of the project. All staff from all seven schools attended. Presentations were given by teachers on the curriculum developed through their participation in the Intel program. The new project staff who would take up their positions in the following year were also invited to this day.

A Laptops for Learning day was held near the end of year one of the project, for all teachers from all seven schools who would be teaching year seven the following year. This day (286 attended) achieved an attitudinal change because many barriers to using ICT were overcome and reassurance was given to teachers. During this day, the project coordinator advised that this did not require big changes to what they were doing, but was an opportunity to allow teachers to think about teaching and learning.

Glenn, ICT Leader at Red Gum College, specifically mentioned “attending the elearning community PD days”. After noting that “teachers had to be brought on board”, Hilary, a part-time coach at Red Gum College, went on to talk about the professional development that was offered across all the schools, including the Laptops for Learning day: “All of the schools and all of the teachers went off on a PD day and learned about how to manage laptops and how to use them”. Tanya recalled, “we had the PD days, which were really fantastic in terms of setting up a positive expectation and making teachers want to be involved in it”. The whole network PD day, with a focus on the laptop curriculum, was an opportunity to share ideas and reiterate the vision of the project, as well as the networking opportunity it provided for teachers. Teachers were given the

chance to talk with others and time to produce and share practical strategies for the collaborative laptop program.

The community also convened a conference in 2007 to share its practices with the wider education community. The project coordinator and some of the network-based coaches presented a keynote address jointly. One aspect of this keynote presentation was the professional learning approach of the elearning community, which the researcher presented in her then-capacity of network-based coach. During the keynote address, this was presented as a new three-level approach to professional development that includes formal, informal and chainmail professional learning. Figure 22 is a diagram from the keynote slides used to describe this approach.

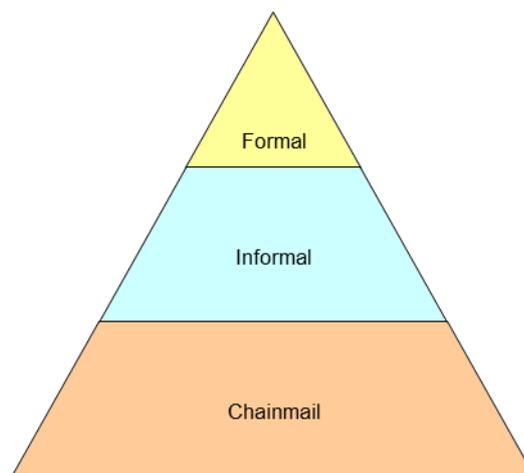


Figure 22. The Three Level Approach to Professional Development (Keynote Presentation, 2006, Unpublished)

The following summary of the program is based on the keynote address given at the conference. The informal professional learning included: just-in-time support, team teaching with coaches, and unit planning (Keynote presentation, 2006, unpublished). The elearning community

approach was “just-in-time, onsite, used local equipment, learner driven, and learner centred” (Keynote presentation slides, unpublished). During the keynote address, the researcher explained that the community was trying to address the common barriers to ICT integration of time, pedagogy, resources, support and computer skills through our approach. The ways chainmail (collegial) learning occurred was through word of mouth, being seen in action, professional learning teams and sharing through email/Skype/face-to-face (Keynote presentation, 2006, unpublished). Science and maths teacher from Red Gum College Jayne, was featured in a video clip talking about her success with digital storytelling and the transformation of her teaching that was attributed to having “time, pedagogy, resources, support, and computer skills” (notes made by the researcher for the keynote address). As there was no reference to chainmail professional development in the interview data, the term “collegial professional learning” is used in this study. It can be argued that this is the type of professional development that makes the most impact (see section 7.4 for further discussion).

7.2.3 Intel Teach to the Future program

Many teachers were able to take part in a 40-hour Intel Teach to the Future program to design a unit of work integrating 21st-century learning pedagogies. Coaches Jim, from Wattle College and Annette from Ferny College ran the Intel course in their schools just prior to the project starting officially. Annette continued to run these courses in her school, co-facilitating with network-based coaches (Sylvia and myself) who became qualified trainers. All four teacher participants in the study who did the Intel course reported positively about their experiences. Jayne a science and maths teachers at Red Gum college and Lucy a teacher from Banksia College both responded, “That was fantastic”. Jayne, a teacher from Red Gem College, was proud of the unit she developed on diseases for her year eight students: “It was just incredible. I learned a lot

through it, and starting from there I also designed my own unit on diseases for my year eight, just because I learned so much there”.

Lucy, a teacher from Banksia College, reflected on the extent of her learning in that occurred as a result of the Intel Program this way:

I did the Intel course, which was huge. That was the 40-hour one, whereas I would probably before talk about doing things with kids, to actually do it. That made me make some resources that I have done. I probably did not get as much out of it as I should have done, because I probably should have worked a lot harder. I have not created a website really. I did PowerPoint and things like that, and I did use RubiStar to make some criteria sheets.

Although Lucy did not create all of the types of resources, she still did many things she had never done before. After doing the Intel program, Mary, a teacher and head of the Humanities faculty at Ferny College, felt the other professional development offerings were not advanced enough: “I would have liked a few more things in the PDs that allowed for people who had done something like Intel as a lead-in”. These examples illustrate individuals’ progress arising from participation in the Intel program.

Lucy , a teacher from Banksia College, describes the added benefit of collaboration with another staff member who participated from her school, as well as teachers from other schools:

I really enjoyed that and [my teacher colleague] and I helped each other, fed off each other, and helped each other develop some resources. Also with other teachers from other schools. There is no way that I would have had that, so that provided the most value.

Andrea, a science teacher at Wattle College, on the other hand, found the program “extremely good”, but it “would be better if you had a whole faculty doing it at the same time”. If all faculty members had collaborated on the curriculum development, then the units developed would have had a better chance of becoming core curriculum. Andrea was unable to broker the curriculum into local practice in her school. The reason, for Andrea, was that “It is difficult when one person does it, and I was not in a position when I did it to change any of our curriculum”. I rephrased back to Andrea: “You would have liked to have worked with someone from your faculty in the course to develop something together, perhaps?” Andrea responded: “Yes. And something that we could then spread for it to come into the core program”. Andrea was not the coordinator at that time in her school and did not have the legitimacy on her own to negotiate the enterprise at the school level. If this had been developed collaboratively between two or more staff members, it might have had more traction.

This section and its three subsections have given an overview of the formal professional learning offerings of the elearning community project and the ways that follow-up support was provided. The focus of this section has been finding 11, that formal professional development provided the opportunity for pedagogy-focused learning and networking. The next section discusses the finding 12, which focuses on the informal coaching support.

7.3 Informal Coaching was a Situated Form of Professional Learning

In this section the 12th finding, that coaching was a situated method of professional learning in integrating technology and was tailored to the teachers’ needs is discussed. This is a large section with two subsections. The first subsection presents data relating to increased confidence in teachers due to working with coaches. The second subsection relates to the

perceived value of just-in-time professional learning, also referred to as informal professional learning. This section begins with a general overview of the coaching program, presenting coach and teacher views on coaching in the community.

Project Coordinator Emma said that one of the most prominent gains was having the coaches available to support the professional learning of teachers, especially by being able to help in the classroom:

That probably was one of the biggest wins we had in the entire program, and that was due completely to the fact that we had such strong people as network-based coaches and learning technology coaches.

Emma continued along these lines, in relation to the coaches, when she said, “They were people that the rest of the staff respected and wanted to work with, and they had clear ideas and expectations”. This respect indicates the legitimacy of the coaches. Emma further elaborated:

The biggest strength was that we gave a lot of different opportunities. We let people pick up things at their own pace, depending on what their skill level was at that particular time. We repeated things so that people could come back to them and trial them. The biggest point of all was that we gave people support within the classroom when they were ready to try those things. The only reason that the project was able to do that was because of the funding for the coaches and network-based coaches. It was not just somebody telling them how or why to do something. It was someone who was actually there to help them as they wanted to try to implement something or try it a different way. That was the biggest success of the entire project.

Teachers find coaches helpful and supportive when trying to integrate technology. One way of gaining legitimacy is through being useful.

Julie was initially involved in the project as a key learning area (KLA) leader in her school and was then employed in the project as a network-based coach. She spoke about how collaboration was important in both roles in engaging with the project:

My role as a KLA leader initially in the project was to work with the network-based coach based at Red Gum College, which was you, Pennie. I worked with my staff and you to start getting the readiness and awareness of utilising technology into their curriculum. That was the initial part of my collaboration in this journey, with a set of teachers working with the project person in our school. As a network-based coach, the integral part of that role was curriculum support with staff, developing and writing curriculum, developing awareness of different technologies and supporting them.

In the example here, Julie explained the role of a network-based coach in supporting curriculum development and raising the awareness of teachers about different technologies.

Michael, a teacher from Manna Gum College, spoke about his experience working with Tanya, one of the part-time teacher and part-time coach at his school, in his classroom, as well as attending PD run by network coaches. Michael mainly sought help with:

getting taught trying to help the students to use multimedia and present—PowerPoint-assisted presentations, for example, on the big screen ... I have mainly worked with Tanya in the classroom with students and also personally. Doing some PDs, helping out so I have utilised the learning coaches when they were available, quite a lot, actually. A lot of

multimedia with the things that I was not familiar with, for example, students presenting in front of their parents, staff and each other in the Learning to Lead program and the Duke of Edinburgh program.

Tanya established her legitimacy through being helpful in supporting multimedia presentations for Michael. Being helpful is one of the ways Wenger (1998) explained that people can gain legitimacy. The perceived benefits of the project for Michael were “having access to a lot of good gear has been good and having the learning coaches”. He described the coaches as “fantastic as an extra support”. Michael noticed the benefits of the extra technology and the support of the coaches. At the time of interview, he did not think they were around anymore; they were not.

Tanya talked about working with a classroom teacher to run projects and develop curriculum, and then working with other coaches to develop whole-school programs. She primarily saw herself as a teacher who worked with “other teachers in their classrooms”. She saw it as a partnership: “I’d go in and we run projects together”. The approach of running things together made way for a shared practice, instead of the coach leading the practice. Working together started at the curriculum development stage: “I’d work with them to develop curriculum and decide how we are going to structure it and how we are going to integrate the ICT ... Then I would work with the other coaches to develop whole programs for the school” (Tanya). This indicates that the learning and collaboration were developed into shared repertoires not only in that school, but brokered across schools through the coaches.

Peter’s role and identity changed when he became a part-time teacher and part-time coach at Wattle College, where he had been teaching for many years. He had already established his legitimacy in his role as a teacher colleague and then established legitimacy in his new role and

identity of being a helpful co-teacher. Peter was involved in the development of new professional conversations around the teachers' practice:

We tend to be a fairly cohesive staff and talk a lot about what is going on and communicate, but I had the opportunity to speak to them in a very different role. I was often in a role where I was in their classroom helping out with things they wanted to do with their kids and in a much more of a collaborative, in-class role. We were talking about specifically the educational activities that were going on and how I could help with them.

Peter indicated he was able to relate with staff in a different way in the role of a coach during the project. He goes on to explicitly talk about working alongside teachers, planning and then implementing technology in the classroom:

I would be approached by teachers wanting to introduce specific things [for which] they did not have [the] skills. I would go along and help. I would have apprentice teachers wanting to do Photo Stories and so I would sit in the class. I would work them through it beforehand, they would go into the classroom and, depending on what they wanted, I would model the classes for them. I would just go and help them with the class. I had to provide technical assistance or back-up if they were going to do the class. It varied depending what people wanted.

Peter explained the process of working with teachers before the class and then coming along to help during the lesson. Importantly, it was the teachers identifying what they wanted assistance with.

Peter, who had a background in teaching art, media, IT graphics and woodwork, also described some of the kinds of technology integration he assisted teachers with in class. The example below demonstrates the shared repertoires spreading across different learning areas or subjects. He explained:

We did a range of things with just using some minor robotics in sciences, we did that website for them, just graphic work and a whole range of digital photographic work. A range of subjects that had not even used that before. We introduced photography and PowerPoint into the food classes, to allow them to explore other avenues of using ICT in their classes.

Peter was able to introduce the use of multimedia into other curriculum areas that he would not have worked across as a classroom teacher.

Jayne, a science and maths teacher from Red Gum College, said that without the coaches she “couldn’t have survived”. She spoke very positively about having a lot of support at school:

Jenny is really good. I am there with her all the time for my maths specifically. I needed a lot of help for different math programs. The interactive whiteboard, she taught me a lot on it, and I got to see new programs and how to encourage my students to learn better through the interactive math board. Before that, Hilary was here and she was involved with me all the time, teaching me all about new websites, interactive math games, interactive science games, ClickView and Digilearn.

Jayne talked about the wealth of resources her coach helped her discover. Many of the resources coaches shared might not have become artifacts used by the whole community. In this way, the coach was able to meet specific resourcing needs according to a teacher's program.

Carolyn, an English and humanities teacher from River College, also described the assistance of network-based coaches and the increase in teachers' expertise at the school as a result of the programs:

I worked a lot with Celeste. You, the network-based coach, you came to the school and worked with us in the English area, which was really helpful. I thought it was a brilliant project, it simply brought a lot of resources to the school that we would not have had otherwise. I felt that most people's expertise was hugely increased. There were a lot of people at the school, including people that I worked with who did not have any elearning happening in their classrooms at all, and over the time of the project I think everybody began using things.

Carolyn also reported, "The main thing that was really good was Celeste, the elearning coach". The reason for this, according to Carolyn, was because "she is so easy to work with as a coach". Carolyn, at the time of interview, was working as literacy coach with Celeste at River College. It seemed Celeste had many of the personal qualities that helped her develop relationships with all the staff at her school. Coaches need to establish legitimacy and form good relationships. This is discussed further in section 8.5.

Andrea, a science teacher at Wattle College, appreciated the range of support a coach could provide. This extended to in-class support, which was valued:

It is a great way of learning from other people. It is a good way of increasing ICT skills by getting somebody into your classroom if you needed to, to help you with any new thing that you wanted to do. Even to the point where they would run one class for you and then sit with you and help you the next time around. Definitely a good way of learning all about ICT and how you can use it in the classroom.

The coaching relationships continued for some teachers. Coaches who were able to meet the needs of teachers would be sought out again for assistance.

As well as individual assistance, coaches were able to work with key learning area groups of teachers. Mary, teacher and head of her faculty at Ferny College, affirmed that “The coaches are really useful to go to, to ask for help, get them in when I did not know how to use the programs, use them for assisting with things specific to the faculty”. She perceived the coaches as people who could tailor the learning about the software to the faculty’s need, as opposed to simply giving instruction in how to use the software in general. For Mary, coaches gained their legitimacy to broker ideas with her local faculty group through their usefulness in demonstrating software relevant to the faculty’s needs.

William, a part-time coach and teacher from Manna Gum College, explained that he worked with staff groups in his school:

I have worked with teachers here on a couple of different things. Certainly with science, and with LOTE [languages other than English], and also with humanities, getting ideas from other teachers and helping them out when they have got ideas, and making things practical.

When William mentioned “helping them out when they’ve got ideas, and making things practical”, this is an example of how new meanings were created through the brokering practices. He brokered ideas from other teachers. Some of the subject area groups might be small communities of practice. It was recommended by Sailin and Henderson (2012) that approaches to professional learning should consider working with the existing communities of practice in schools. It appears that William was able to work to broker ideas with the existing communities of practice in his school.

This section has given an overview of the follow-up support coaches were able to offer in addition to the workshop sessions. In the next subsection, the focus is on the increased confidence of teachers through working with coaches.

7.3.1 Coaches build teacher confidence and willingness to take risks

Coaches contributed to increased confidence and thereby the self-esteem of teachers in the ways professional development was approached in the elearning community. Self-esteem is an important contributing factor in improving willingness to participate in teacher professional development (Hur & Brush, 2009). The development of the relationship between the coaches and the teachers contributed to their success in learning to integrate technology, because teachers became more willing and motivated to participate in the situated professional learning through coaching since important social needs were being met at the same time as knowledge sharing. This study has found that teacher confidence developed from the positive relationships formed with coaches and the increase in knowledge and skill development as a result of coaches and teachers working together.

A recurring theme in the data is that, with some assistance in the classroom, teachers then had the confidence to try and integrate technology themselves next time. Coach Tanya saw it as part of her role to inspire teacher confidence:

It is a project where we are trying to set up collaboration and to draw on the resources that we have within our school and to show us that we actually do know a lot more than sometimes we give ourselves credit for. There is been a lot of teachers who deny their technical ability and said that they could not do it, and then have found themselves very, very capable. It is been about giving teachers resources and confidence within themselves.

In saying that “it is been about giving teachers resources and confidence” Tanya emphasised the importance of teacher self-esteem for their ability to adopt new practices. For the teachers gaining confidence, it was also a shift in their identity from, in Tanya’s words, “not technical” to “very, very capable”. This example represents a coach’s point of view. Following, we look at the impact of confidence and shifting identity from the point of view of the teachers.

Coaches helped Lewis, an English and literature teacher, not feel like a “Luddite” (his own words): “I would not go seeking out computer people because, as I told you, I am a bit of a Luddite, but they [Hilary and Jenny] actually have been helpful. They have known that I am sometimes a little bit apprehensive about using technology, so they sought me out to help me out”. Here it is evident that a coach needed to be a person who could work with everybody to bring them on board. Although Lewis called himself a Luddite, he seemed engaged in the elearning projects on a number of levels and found learning from others who had been at the PD to be “handy”. Lewis’ identity shifted away from this Luddite view of himself over the time of the project.

Lewis developed competence in technology integration through working with the coaches and thus shifted his identity. He stated explicitly that the coaches helped him to have confidence in his ability to take on technology:

Hilary was great in that she made me more confident and she made me do the e-potential survey and then basically said “Hey, look, you are not as bad as you think”, so that was really good to help me get moving.

Lewis also benefited from working with Red Gum College’s other coach, Jenny. He felt Jenny gave him “that real sense of monitoring my progress, and offering me things that she thinks I need along the way”. Lewis observed that “Jenny’s also been great in just keeping her fingers in everywhere around the school to just check where people are at and identify teachers who do need help”. He preferred having coaches around during school time, as opposed to workshop sessions offered after school: “I have been to the odd ApprendWeb PD” but admitted he was “one of those staff members who doesn’t go looking for extra after-school PD”. Lewis’ identity shifted from “Luddite” to “not as bad as you think”. He had not used Skype prior to the interview with the researcher and took pride in the fact that he was able “to just work it out”. This was an attribute of his newfound confidence in perceiving himself as able to use technology. He attributed this willingness to try a new technology to “people like Hilary letting me know that I’m not stupid”. Lewis no longer saw technology as the domain of other people and, through the cluster community formed across the schools, technology became everybody's domain.

The theme of teachers trying things themselves after some coaching support is supported by the comments of teachers. The outcome of having a coach for Carmel, a teacher at Banksia College, was confidence to try new things herself the next time around:

Yes, just more aware of ICT, and I have gained more confidence in using it and having a go and trying to use things in my classroom. I used to be terrified of putting a projector together, but now I can do that no worries.

Carmel used the word “terrified” to describe how she used to feel at having to set up the digital projector and now she had more confidence around this. Her identity also shifted and for a task she used to be terrified of, she could now do that “no worries”. Use of this expression shows a big shift for Carmel from feeling “terrified”.

Another teacher who became confident to try integrating technology after coaching support was Diane from Manna Gum College. Diane developed confidence in using technology and more comfort in taking risks trying new things:

I am more confident in using technology. I am not frightened if things go wrong. ... But these things happen and our students are more aware of what’s out there in the way of ideas or programs. ... It has expanded my knowledge of what is good in terms of making sure that I then try and teach the kids that you cannot just take anything. You have to look at where it has come from.

Diane talked about her increased confidence in using technology and knowing what is out there and in her facilitation of its use with her students. This included teaching students to be critical users of the Internet in understanding how to evaluate the web resources they find.

Andrea, a science teacher from Wattle College, said “I have changed the way that I teach because I use more ICT”. Further insight in to the way Andrea changed her teaching is given in

section 7.5, Illustration of Practice 3. Collaborative Water Project. The way a teacher teaches is inextricably tied with their identity. What allowed this identity shift was, in Andrea's words:

The thing that made the most impact is just having the support when you are trying to learn something new, and also telling the students that you're doing something new so when you stuff it up, as you invariably do the first time you try it, they are quite happy to sit and wait for you to fix it, or go onto something else if it is been a total disaster, and then come back to it at another stage. So that is probably been the best thing.

My analysis indicates a number of factors are at play when a teacher finds the confidence to take risks and try new things even if the result might be a potential disaster. Integrating ICT and trying new things were cemented as part of an accepted joint enterprise and teachers felt they had approval to take these risks. The community joint enterprise was seen to be endorsed by the school principals and teachers were able to rely on this as permission to take the risk of potential failure; they had permission to experiment.

Both the coach and a teacher from Eucalyptus College felt the project as a whole gave the whole school the confidence to move onto the next phase of technology integration after the project finished. My analysis of these interview confirms that Manna Gum College as a school felt it could enter the "next phase" of technology integration "with a lot more confidence".

Louise, the coach at Eucalyptus College noted that:

There was a bit of worry at the beginning of the elearning community, how all this is going to work, but now we are sort of with the introduction of the netbooks, everyone is ok with that. "Yeah, ok" we can handle that now because we have done all this sort of

stuff, we know we can handle new types of things and there is not that same trepidation, which is really good.

This idea of increased collective confidence from the project as a whole, and the shift in group identity and confidence, was supported by Gwen, a teacher librarian from Eucalyptus College. She noted that it was 2008 when her school “really rolled it out”. Gwen reflected that by then “We were confident enough to move ahead”. It was after the official funding period that “in 2008 and 2009 there has been massive strides in how we are using the technology in the classroom”, and Gwen attributed this to the “confidence to do that through elearning community”. If it were not for the project, in Gwen’s view, “it would never have happened”.

The increased collective confidence inferred from Louise’s and Gwen’s interviews certainly indicates the “mutual constitution” (Wenger, 1998, p. 146) of identity and community. It can be concluded that the staff at Eucalyptus College had “ownership” (p. 147) of their meanings and were on a joint or collective trajectory into the next phase. Wenger did not discuss joint trajectories and referred to trajectory as an individual’s non-fixed, ever-changing movement. I contribute to theory here the concept of a collective trajectory in relation to the staff at Manna Gum College.

7.3.2 The power of just-in-time professional development

Teachers valued coaches’ being available for just-in-time-professional development. This just-in-time professional development was also described as informal learning by participants.

Ben, a network-based coach and then ICT coordinator in one of the schools, juxtaposed talking about the ineffectiveness of conferences with saying just-in-time PD was the best thing to come out of the project:

The best thing to come out of the elearning community was that notion of just-in-time PD and having access to the learning coaches just as you need it. That was by far the overwhelming thing that the staff wanted the most and that is the thing they miss the most. We have constantly got staff saying “Can you help me with this or that?” and we having to say “No, we have not got time to do it”. There is an attempt next year to try to make up for that. Next year we’ve got Julie becoming an assistant principal with that as part of her role. Still, again this is tied in with being an assistant principal. What the staff really told us they want is access to someone when they need it, to show them how to do something.

Being able to access someone when they needed it was highly valued by teachers. This example demonstrates how Ferny College was trying to make provision for staff to have access to a coach for this kind of professional learning again.

Coaching was perceived as more effective than one-off workshops, according to coach Robert from Banksia College and coach Celeste from River College. Robert, a coach at Banksia College, put it this way:

I did present the hour sessions, but I felt that they were pretty insignificant in terms of what you can do if you can just work with one person when they have got a need for it, and you have a chance to develop over a period of time.

The reason that the one-off sessions were “insignificant” compared to being able to work with a teacher “when they have got a need for it” (Robert) was that teachers could immediately put the new learning into practice. Celeste, a coach at River College, indicated that coaching in school was better than workshops for changing practice: “It is better than going off for one day here, because that does not often change a practice that is ongoing and sustainable in that learning sense”. In this reflection from Celeste, the coaching was perceived to be a way to facilitate a sustainable change in practice that did not often happen after external day courses.

Resonating with the research presented in the literature that little is retained or implemented from technology-focused professional development. Hilary, a part-time coach at Red Gum College, said, “You can take teachers and you can give them professional development and they can come back and forget it in an instant, and unless this is actually what they need right there and then”. The answer to this, in Hilary’s experience, was emphatically that “I think with professional development—it needs to be “just-in-time”. Talk about using words, Pennie. Gosh, we came to that conclusion, didn’t we?” indicating that the researcher and Hilary had worked together and discussed this notion in the past. Hilary and the researcher had this conversation about what coaches need to be able to do to provide just-in-time support:

Hilary: Half the battle as an elearning coach or network-based coach is working out what is needed right there and then. You can get them organised, you can push something, but unless it is something they need right now, they will not take it on.

Researcher: So you have to be ready with a repertoire of things?

Hilary: You have to be like what you are expecting them to be as a teacher, you have to be ready to pull whatever out of the basket they need right then and be competent at using it. It is quite challenging to be good at everything and pull it out and say, “This is

what you need and this is how you use it” and “Here is an idea” when you might only have it half-formed, and half-formed ideas do not get taken up. They want an answer now.

Hilary’s comments here indicate that a coach had to be ready with many ideas and skills to be adapted for the individual teacher’s need.

Three coaches, Annette, Peter and Jenny, evolved the ways they worked with staff from offering workshops, where they set the topic, to providing what the teachers asked for. The first example is Annette, from Ferny College, who described this change in the way she offered PD as the project progressed: “I have not been providing PD that I think is important. I have been providing PD that teachers ask me to do, more than me saying ‘This is what we are going to do. If you are interested, come along’”. The way Annette previously ran PD was a problem because “staff felt like they had to come and it may not have always been appropriate for them, but often they came anyway”. Annette explained that now it was offered “by request”. Annette clarified that “If they tell me what they want, it is better”.

Peter, a part-time teacher and part-time coach at Wattle College, described the workshops he would run in the beginning, such as PowerPoint or Excel, but after some time the majority of his work was “informal” in attending to staff needs as they arose. He described the change in his workshop offerings as becoming “more just-in-time training”. Peter described the distinction as a shift from formal professional development to informal:

It started off as a formal process and ended up as a far more informal process where the staff are coming and seeing us. I would say it ends up with probably 80% of my in-service

time spent in the last 18 months of the program, maybe the last two years of the program, would have been almost entirely informal.

It seems that the workshop model was a good way to initiate technology professional learning but, as teachers began to use technology, they later knew what their specific needs were and asked for this. Jenny, a coach at Red Gum College, reflected on workshops versus one-to-one learning:

There were times when we tried to offer lots of big sessions, and big afternoons or lunchtimes of PD. There were times when it was good, but I found more and more so that teachers are less interested in that and I tend to run a lot more one-to-one PD, short and sharp, and really well targeted. It is meeting people where they are at and providing a need that is really relevant to them. The most powerful professional learning model has really been there just-in-time learning and being there to rescue somebody when they really need something badly. You know that once you teach that thing to them, they are actually going to go and use it, and that helps to embed it in their learning and their teaching practice.

Jenny found that while the workshops were a good method of introducing a range of new ideas, coaching in the form of targeted just-in-time support was sought out by the teachers and helped embed new ideas into practice.

Informal professional development was preferred by Diane, a teacher of French at Manna Gum College, because she felt she had more success with learning when she could learn a bit at a time. Professional learning was successful for her when she learned a little bit at a time. Diane described her preference for informal professional learning:

I like the informal stuff better. I tend to take things in in small doses. That is my personal learning style. Big things, you are just getting too much information thrown at you. I probably would have got lost, because I am not particularly technical, to tell you the truth. I have got to follow step-by-step a few times, then I sort of can stay with it, so I prefer informal PDs.

Diane was more involved in informal professional learning. This involved working with the coaches on-site. Diane indicated that this was her preferred method for learning to integrate technology.

Coaching was attractive for time-poor teachers. With so much going on in schools, in situ informal professional learning could be accommodated. Carmel, a teacher at Banksia College, was also more involved in informal professional development:

Just through the sharing of ideas and seeing what other teachers have been doing in their classrooms, and as best one can. You know what it is like in these busy places, unless you have got the actual time to sit down and share things, sometimes it kind of happens on the hop, when somebody is there and “Help, help,” those situations. More informally than formally.

Having a coach on-site meant that teachers were able to seek help when they needed it. The example above demonstrates that teachers had a hard time finding time for professional learning and having assistance when it was needed worked within their time constraints.

Some coaches were seen as saviours to come and rescue teachers who were trying new things with technology. Maria, an English and humanities teacher at Eucalyptus College, said:

Louise was invaluable in terms of setting up digital portfolios, and with reports and things like that. Whenever there was a problem I would always press the panic button, and Louise came to the rescue. She was really good to have on-site, with hands-on help.

Louise indicated that this mode of professional development was a frequent occurrence. The demand was there for this kind of support for teachers. Louise explained it this way:

A lot of it was one-on-one PD because people wanted you then to help them with a certain thing and that was actually really good. It was great having someone available to help them when they needed help, that was the type of PD that I felt was really useful. The staff felt confident because there was someone who could come and help them when they needed it. That model of having someone full-time or at least most of the time available was really good.

Louise indicated that the model of having a coach full-time was effective. The study by Skues and Cunningham (2013) supported the full-time availability of coaches in schools.

Jim, a coach and ICT Leader from Wattle College, described the project more broadly as providing people power—time for the coaches to make sure staff were involved:

It was a project that gave us, in particular, people power. There was time for the coaches, and forced staff to be involved. Too many staff are happy to let things like IT pass them by, and here they were forced—there was no excuse for them not being involved. They could call on me and I could drop by a class, or they could call on Peter, who was the other coach at our school, and he could drop by. Neither of us were intimidating, we were friendly sort of guys and we had a good reputation in the College, so they were happy to

bring us in. It was a people time. It was a focus on the classroom, whereas a lot of other times we focus on the technology. It was nice to focus on pedagogy and curriculum, and that was really cool. It was a time of focus, a time of refocusing. For us, it has built a foundation we are going to follow up for years to come.

Jim talked about the shift in focus to curriculum, as well as the more technical work he had already been managing prior to the project. He seemed to add another full-time role in becoming a coach. Jim talked about his approachability and his good reputation, which translated into high legitimacy for introducing new practices at the school. This was different for Jim, who had always been in an ICT role but enjoyed the increased focus and time on upskilling staff to the new joint enterprise of teachers integrating technology in their teaching.

Carmel, a teacher at Banksia College, was enthusiastic about the coaches: “Yeah, I think it was a godsend to have the learning coaches arrive, and I worked very closely with Robert when he first was appointed, and that was just great”. She went on to say:

You know what it is like being in a classroom. You sometimes can feel quite isolated, and if technical problems do occur and if I am not able to fix the problem, then I am just a bit out in the dark. Thankfully, our learning coach was around and was able to assist and help in things like that.

Teachers perceived coaches as helpers and rescuers. One teacher did have second thoughts, thinking perhaps they were becoming too reliant on these positions. This thought was also reflected in a comment by the coach at her school.

On the topic of professional development workshops, Maria, an English and humanities teacher at Eucalyptus College, felt that she needed remedial professional development: “It is always there but I just—I need remedial professional development in lots of ways”. When prompted further with the question by the researcher, “So what is remedial professional development?”, Maria replied:

I heavily relied on Louise to come in and help me out. She was my right-hand woman virtually, because I used to sort of get caught up with all the little technical hitches, and she was there to rescue me every time. If it was not for Louise, I do not think I would have been able to put them—I had the material, but technically to get it on the digital portfolio and to physically present it. It is just not my cup of tea.

The remedial professional learning for Maria was to have the coach, Louise, by her side to help her with the more technical aspects that were not her “cup of tea”.

Michael, a teacher at Manna Gum College, needed to learn Elluminate software to present a webinar on the GPS project:

I tended to seek individual support PD from the learning coaches, one-on-one. I found that more effective than a general PD that maybe was not specific to meeting my needs, so I found it a lot easier just to book them and help me learn what I needed to learn, and not what generally was thought what people needed and, yes, I found it useful.

One-on-one professional development meant teachers’ needs could be met directly at the time they needed it. Some wanted remedial professional development, others wanted advanced.

Mary, a teacher at Ferny College, had participated in the Intel Teach program. She “would have liked a few more things being offered that allowed for what you have done in Intel”. Mary found that the workshops were not an extension of what she had already learned in Intel and would have liked some more advanced offerings. Yvonne, a teacher who had been an elearning coordinator at her school during the time of the project, also found the workshop offerings too basic and had not really gone to professional learning sessions in the last few years. Yvonne’s style was more self-taught learning.

The next excerpt is lengthy but important. It encapsulates the essence of the just-in-time model presented in Figure 23. Hilary, a part-time coach at Red Gum College, described the range of coaching support:

The professional development could easily be me coming into the classroom and using the interactive whiteboard (we have not talked about those) and the laptops, me helping with movie-making or movie editing or using video. It could easily be me working with the kids and then the teacher looking on, and the kids taking it on and the teacher not becoming the expert—they do not have to be. It could be the interactive whiteboards, just the teachers has got a couple of ideas about how to use it and things go wrong, and you are there just to step in and say “Actually, you need to lock that image or otherwise it’s going to move around”. The teacher goes, “Oh, that is cool”. That very much stays with them. They got stuck. You showed them how to get around it. Next class they will not need you. That was the most powerful thing. That is very time intensive. That can be one-on-one. It is not easy to offer that for everyone.

In the quote, above Hilary explained why the just-in-time model was so important for teacher learning. The assistance was given just at the right time and then the practice was embedded for future attempts. Transformational learning was possible at this juncture.

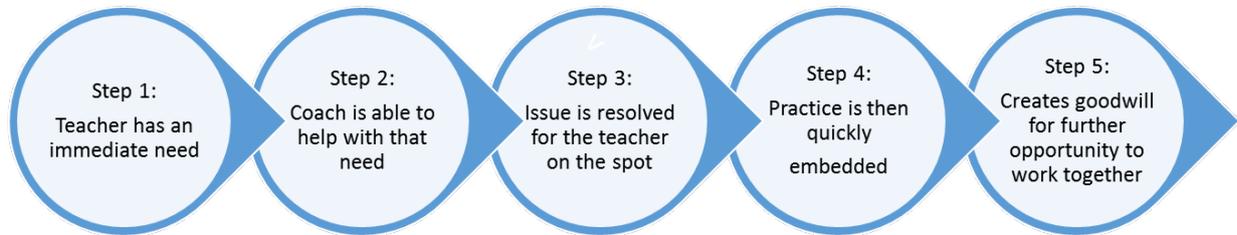


Figure 23. Just-in-Time Model of Professional Learning

Just-in-time professional learning was valued by teachers. Having a coach available in their school meant that teachers could often get help on the spot. Just-in-time support happened sometimes outside class and sometimes in-class, and sometimes a combination of both. If there was an issue in class and the coach could help on the spot, then the teacher could learn on the job and embed the new practice immediately. Just-in-time support provided immediate, contextualised help based on the teacher’s need. It was a situated form of professional learning. Because it was job-embedded, the new idea quickly became embedded in regular practice. The teacher was able to negotiate and fulfil the joint enterprise. Zhao and Frank (2003) argued that “unless a teacher has a positive attitude about technology they will not use it” (p. 808). However, the continuation of the “repetitive cycle of blaming teachers” observed by Orlando (2015, p. 51) as one of the problems in educational technology research is also unlikely to contribute to changes in attitudes or practices. As Orlando (2015) pointed out, there is benefit in listening to “teachers’ critiques” in order to find out what is really going on in schools with regards to the poor uptake of technology practices.

The just-in-time model allows for a positive experience with technology and thereby the attitudes to technology can change. It may well be putting the cart before the horse to think that teachers' attitudes towards technology can change first in order for them to then use technology successfully. The just-in-time model allows a supported successful practice that leads to attitudinal change. The teacher, in this way, is able to engage in legitimate peripheral participation in a new technology practice by working closely with the coach, who might quickly model a process the teacher can then replicate. The just-in-time model also allows for tacit learning. A success in such a situation creates goodwill for trying another innovation at another time. The coach and teacher develop mutuality and demonstrate their accountability to the enterprise. The teacher has the content expertise and the coach can help with the technology. The coach has a repertoire ready to adapt to purpose for the teacher's varied content and classroom context needs.

This section and the two subsections has discussed finding 12, that coaching was a situated method of professional learning in integrating technology and was tailored to the teachers' needs. The next section discusses the 13th finding, which focuses on collegiality as a source of learning for teachers in this community.

7.4 Informal Collegial Professional Learning was Valued

This section focuses on finding 13, that collegial professional learning supported teacher practice in integrating technology. Collegial professional learning occurred in a number of ways. Teachers worked with coaches and then shared with other teachers. Teachers learned from other teachers through professional learning conversations. "Cascade learning", which refers to sharing knowledge and resources after attending external sessions, did occur, but this section also covers collegial learning that did not necessarily occur after an external workshop. By using the more

generic term “collegial professional learning”, conversations or exchanges that were mutually beneficial are also encompassed.

Many teachers who did work with the coaches then shared their learning with other teachers. Diane, a teacher from Manna Gum College, spoke about working with two of the coaches (one was Tanya, also interviewed in this study) in class. She then shared that “Some of the ideas that I got from them with some of the other LOTE [languages other than English] teachers”. Diane reiterated that the benefit of having coaches was not only that they could come and show you how to do something, but that you could then pass this onto other teachers:

It is just terrific having the elearning coaches and being able to get them to show you how to do it. Then you can pass that onto somebody else who may not have heard about it.

That has been good. Because we are a small faculty, we are closely working together, so that only augmented what we did, but it has been terrific.

This shows how the learning is leveraged across an organisation when practices are adopted and shared by the central participants with those who may have more peripheral roles.

Shared repertoires of curriculum were being shared between the schools. This was recognised by Andrea, a science teacher from Wattle College, who described the flow-on effects of the elearning community:

It is a good way too of working with people who are travelling around to different schools and bringing schools closer together in some ways, and learning from each other too. If one person created an assignment at one school, it could then eventually be used through

quite a few different schools. If students travel, they would almost be getting the same kind of stuff they had somewhere else in the area.

Andrea saw it as a positive that teachers could share their work across schools. A benefit Andrea identified in schools having shared repertoires around curriculum was the benefit of continuity for students if they changed schools.

Teachers learned from other teachers at workshops or after working with coaches, and shared with other teachers. Jayne a science and maths teacher from Red Gum College, saw teachers sharing with teachers as a major benefit:

We shared our curriculum, worksheets or websites we looked at with each other. Anybody gets a new program or learns something at a new PD, we shared that with each other. My major project was doing an IT program at some college with Sylvia. She taught all about WebQuests and all that. That was really great and helped me a great deal. We shared—I got some resources for biology from other schools, and I put in a few resources from my diseases unit as well.

Jayne, a teacher, was also able to work with a network-based coach and then share the resulting artifacts with other teachers at her school.

Two teachers who had both done the Intel longer course within the community programs appreciated the sharing of resources. Jayne, a science and maths teacher from Red Gum College, expressed the benefit of the professional development in seeing what other schools were doing and the sharing that came out of that:

Even some of the teachers have sent some of the programs that they do in their own schools, and that has been really great. I sometimes use that quite often in my classroom teaching. I think sharing, has been really great. That has helped me see what other schools are doing, and also looking at their programs.

Lucy, a teacher at Banksia College, liked that she could access resources created by other staff:

I have developed some clickable worksheets, like in response to the clickable worksheets workshop that was part of the elearning network. I have put that into faculty folders that students have access to and other staff have access to. I have actually used resources that have been developed by other staff members, clickable worksheets that have been placed in the faculty area folders.

This demonstrates the spread of repertoires shared through artifacts in the case of the clickable worksheets, and that teachers are able to understand what the artefact is and how to use it even though it is shared with other teachers digitally by finding it in a folder.

It has been mentioned earlier that the term collegial professional learning is mostly being used instead of “cascade learning”. However, the following example describes the essence of cascade learning and so it is highlighted here. Lewis, a teacher at Red Gum College, explained that “People go on PDs and then if you have not been on the PD, then the next minute they are showing you what to do. I mean, what we do around here is that if someone goes on one, they often present what they’ve found out to the rest of the department”. The expectation of sharing what was learned from external PD was evident in the community.

Sharing within and between the schools, particularly with a focus around professional learning workshops, helped transform practice through collegial learning after the sessions. Two examples are given here. Maria, an English and humanities teacher at Eucalyptus College, appreciated “the interaction with colleagues from a range of schools” that was a result of having workshops available to staff from all the schools. She described the times when everyone would meet as “good because you could sort of get a feel for what everyone was doing, and what worked and what did not work”, but reiterated that these occasions were rare. Mary, a teacher from Ferny College, noticed that the professional development helped facilitate discussion or connection between schools and also between teachers in the same school and faculty group:

I have felt that because it is not only working with other people within the school but also meeting people from other schools when we were going for the training. It has led to some interfaculty cooperation as well within the school.

Mary was describing the cascade learning that occurred within faculty groups after learning at workshops. There were the benefits of sharing across schools and engaging on a deeper level with those in the same school.

In my analysis of the interviews, it is evident that teachers and coaches reported learning from teachers across different learning areas. The conversations and learning went deeper than just about how to use technology. Glenn learned through conversations with other teachers about pedagogy:

Any teaching is the pedagogy, and that is not always really directly related to elearning. By working with teachers on elearning, I have learned a lot about teaching and the way

that they teach, seen examples of good teaching which I have been able to integrate just through the fact that we are talking about elearning, we always end up talking about other things as well. That is been really useful for me, and I think it is been useful for other people as well.

Diane, a teacher of French at Manna Gum College, shared and negotiated practices within her faculty once she had tried things and discovered what worked:

If I have come across something that works with me, I just mention it to somebody else and vice versa, and sometimes just the setup of things. With using the class laptops, [about] which we've swapped ideas and things that have worked, both managing them in sort of the physical sense and also ideas for the classroom.

The conversations around managing and using the laptops based on what worked was where the negotiations of the shared repertoire took place and also how the practices became reified in the community. Maria, an English and humanities teacher at Eucalyptus College, reported: "It helped me—in amongst the staff at the school as well, people I would normally not have discussed those issues with, it sort of opened up a lot of doors and opportunities". Louise explained: "It allowed me to communicate about curriculum with others that I would not normally communicate with about curriculum—people in areas different than I normally teach". These examples are indicative of the brokering of practices occurring across key learning area boundaries.

Teachers learned through informal professional learning conversations with other teachers. This was because collegiality is a particularly effect form of professional learning. Teacher were also brokers of knowledge, and this was not initially anticipated when I was first

understanding the idea of brokering. Teachers may also have acted as brokers, particularly if they also took on a leadership role such as ICT Leader in their school or those who were key learning area leaders. Teachers who were not in these positions were also able to broker practices if they had the legitimacy.

This section has discussed finding 13, that collegial professional learning supported teacher practice in integrating technology. The next section discusses the 14th finding that collaborative projects intended for student learning were also a source of learning for teachers.

7.5 Cross-Sector Collaborative Projects Were a Stimulus for Teacher Learning

This section discusses finding 14, that collaborative projects were a form of professional learning for teachers in working across schools and with outside experts to facilitate authentic learning for students. Two projects are presented in this section. The first is a water quality project funded by an Australian School Innovation in Science, Technology and Mathematics (ASISTM) grant and the second is a geocaching project funded by Telematics.

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| Illustration of Practice 3. Collaborative Water Quality Project |
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One of the student-focused cross-school curriculum projects run by elearning community project staff was a water quality project funded through a successful ASISTM grant. The researcher in her role as a network-based coach played a key role in the development and coordination of this project. The collaborative water project enabled teachers to facilitate authentic learning for students. The project involved all seven schools and there were three schools in particular who worked more closely together on this. All schools nominated a year

level or class to be involved. All seven schools were located near a tributary of a river and were provided with a water testing kit. There was also the opportunity to work with a WaterWatch consultant and a Monash University biologist to do practical water testing locally. The schools were able to load their curriculum and testing results onto a web site dedicated to the project. Schools also had the opportunity for students to participate in a joint excursion, testing water between the outer reaches of the river and the city. Students from three schools presented their work at the Melbourne and Canberra Kids Teaching Kids River Health conferences.

Andrea, a science teacher at Wattle College, explained that there was a lot of collaboration between a couple of schools in particular on “looking at curriculum and then on the excursions as well. Just looking generally at what we were teaching in the classroom and then on the different experiences we were taking the kids out on”. She summed up this collaborative project in the following way:

We were looking at testing water between the upper reaches of the river right down to the city. Primarily at Wattle College we did it to year nine. We were trying to get them to take an interest in the community and an interest in what was around them. The curriculum we had to look at was, How does the water affect our daily lives? How do we use water? To the point where we started looking at how we actually decide whether or not a river was healthy and what impact did it have on the ecosystem and us and today.

In the interview I commented that “They sound like great essential questions” and Andrea replied, “Well, we worked really hard on it”. Andrea collaborated with the person from WaterWatch and the people from Monash University. She reported that the biologist from Monash University had “a couple of assistants [PhD students] ... they were really good too. The kids actually got quite a

lot of information from them”. Andrea also collaborated with Lewis, a teacher from Red Gum College, and the “English guy”, a teacher from Ferny College and a teacher from Manna Gum College. She communicated with them mostly through email.

Andrea, a science teacher at Wattle College, felt that creating authentic fieldwork curriculum and having students conduct the practical fieldwork was valuable learning for the students:

I liked creating curriculum that was fieldwork-based rather than classroom-based, so most of it is prac. The students have to actually go out and physically do things, and then think about the data that they are collecting and how they can present it, and then what do they do with the data and what does it mean?

Another highlight of the program was the opportunity for students to work with students from the other elearning community schools and make a presentation at the Melbourne and Canberra water quality conferences. Andrea explained that this was an opportunity for students to teach other students:

Then for the group that we took to the conferences, the experiences it gave them was fantastic. They were all really enthusiastic about going and participating, and presenting with students from other schools. They had no hesitation about it. There was occasional nerves, but it expanded their horizons most definitely.

Lewis, an English and literature teacher from Red Gum College, saw the river project as a highlight of the collaboration which occurred between schools: “we did that project, a river ... that was probably the best thing that came out of elearning community for me, was going to the

conference and being involved in that process. So that was great”. The river project is a good example of e-rich curriculum collaboration between the schools.

Andrea thought the water project facilitated collaboration more than attending PDs with teachers from other schools:

Especially doing the project that we did—I got to meet a lot of the other teachers that we would rarely have any contact with, maybe at PDs but otherwise we would not, and when we go to PDs we tend to stay with the people that we know at the schools that we are at. It was a good way of meeting other people.

Andrea thought the opportunity to be involved in the water project “was just absolutely fantastic”. The main benefit was a changed teaching approach in that Andrea learned about “how you go about organising students to do things out of school”. Learning went beyond the classroom with the benefit of having “other schools involved in learning”. This meant Andrea’s students were not just “learning from in their school”, there was the collaboration with others outside the school.

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| Illustration of Practice 4. Collaborative GPS Tourism Project |
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There was also a GPS tourism project facilitated by a network-based coach and school coaches in the project. Coaches supported teachers in a geocaching project that provided an authentic student learning experience for teachers and students. Banksia College and Manna Gum College were very involved with this project and it attracted a Telematics grant. Michael, a teacher from Manna Gum College, spoke about his involvement in engaging year nine students in the “GPS tourism project across the schools”, which he described as “getting students to use the

GPS in class and around the community to promote our community, our local area in the tourism sense”. Michael acknowledged that, “It was good learning for myself and also the students ... It sort of spun off into a few other little things that we do”. The way Michael stated that it “spun off into a few other things we do” demonstrates that he was able to enact negotiability of the repertoire at the local level.

Michael talked about his experience in learning to use online conferencing software to present an online seminar on Sharing life skills using the GPS:

I worked with one or two different principals and the computer technicians to learn how to use [webinar software]. Tanya as well, coaching because I had never used it before. That was a good bit of learning curve for me. Then I felt pretty proficient at using it in the end and confident. That was good. There was a fair bit of collaboration with those parties and obviously with the different people that got involved at the other end of the program that I ran.

Learning how to present online enabled Michael to share his learning with others beyond his school: “I had a few people watch it, it was recorded and watched”. Michael shared his experience in the project with educators across the landscape.

These two illustrations of practice touch on two of the collaborative cross-sector partnerships that teachers in the cluster community engaged in. This study supports the conclusion of the innovation framework on best practice exemplars of ASISTM projects that “there was considerable evidence of professional growth and in some cases professional renewal in their stories. The ASISTM initiative offers a significant model of teacher professional learning”

(Tytler et al., 2008, p. 38). The “mutual engagement” in the “joint enterprise” is clear in these projects based on the participants’ comments (Wenger, 1998, p. 73). These projects also saw the development of a shared repertoire in the development of curriculum artifacts and in the stories around the shared experiences (Wenger, 1998, p. 73). The projects offered a number of opportunities for mutual engagement on various joint enterprises. Schools were able to participate in innovative cross-sectorial partnerships (Doecke et al., 2008; Tytler et al., 2008) that were beneficial for student and teacher learning.

7.6 Conclusion

This chapter has responded to the question, how do teachers and coaches working to integrate technology into the curriculum experience professional learning within a network context? It has been found that a multi-tiered professional learning approach implemented across the network of schools meant that teachers’ needs in integrating technology into the curriculum were met through different levels of support, including workshops, coaching, collegial sharing and collaborative projects. Teachers chose to engage with different opportunities and to work with different people according to their own needs and interests. Vertical and horizontal accountability processes also influenced teachers’ participation. The top-down, bottom-up and perhaps also bottom-across approach afforded by the multi-tiered professional learning approach adopted by the elearning community meant that project aims and teacher practices aligned, resulting in transformation that was perceived as positive from the perspective of teachers.

Chapter 8 Findings and Discussion – The Coaching Initiative

This chapter focuses on the coaches and the ways they developed their practice through support for their learning and making connections with others. Firstly, the coaches formed a nexus group that supported the purposes of the cluster community and developed shared practices around brokering. Coaches connected with others and this was a source of professional learning and support for them. Coaches were also supported by leadership and learning from teachers. Finally, the qualities and approaches of coaches made a significant impact on the relationships developed and this was important for them to be able to do the work of coaching. The case is made in this chapter to support the overarching finding that coaches developed their practices through support for their own learning and connecting with others.

Table 12. Research Question 4, Overarching Finding 4 and Findings 15–19

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| Research question 4: What factors support the work of coaches in their role to assist teachers to integrate technology into their curriculum? | | | | |
| Overarching finding 4: Coaches developed their practices through support for their own learning and connecting with others. | | | | |
| Finding 15: Coaches formed a nexus group and developed shared practices around brokering with the purpose of supporting the cluster community goals. | Finding 16: Coaches avoided uprootedness and brokered practices across boundaries through connecting with others. | Finding 17: The work of the coaches could be strengthened by leadership support with structures and opportunities to learn. | Finding 18: Coaches learned through their reciprocal relationships with teachers. | Finding 19: Coaches developed their identity through approaches conducive to positive relationships and legitimacy. |

8.1 Coaches Formed a Nexus Group within the Cluster Community

This section discusses the nexus group that formed between the coaches that was conducive to their own professional learning and provided a support network. Through this nexus group formation, coaches also developed “shared practices around the enterprise of brokering” (Wenger, 1998, p. 110).

Coaches brokered practices across the cluster community. Gwen, a teacher librarian from Eucalyptus College, described the coaches as “a unifying force”. She noted:

They were people who brought us together for PD, brought us together in groups to find the best way forward with the technology, who gave us lots of advice how to use it. They were certainly people who assisted greater collaboration and greater cooperation in the school because of the program and their presence there.

The example describes the coaches as people who “assisted greater collaboration and cooperation”. The presence of coaches in all the schools helped teachers stay in contact with the cluster community common purpose. The coaches facilitated shared repertoire development in line with the common goals.

The way the elearning community project was structured meant that there was a Project Team comprised of the project coordinator, network-based coaches and school-based coaches. The way this team operated around the joint enterprise of “working out the strategies we were going to use to implement certain parts of the project” (Emma) meant that coaches had a shared focus in their work. The management style of the project coordinator, Emma, who emphasised that she did not take a “top-down management style”, meant that the coaches were involved in

negotiating the strategy for the approaches to the various aspects of the project. With the strong emphasis that Emma placed on collaboration, her style could be described as a “top-down and bottom-up” leadership approach as conceptualised by Fullan (1994). The approach of the project coordinator in instigating a flatter management structure was conducive to the involvement of the coaches in developing the practices within the group. In this way, the group developed as a community of practice and was not simply a project team in the sense expressed by McDermott (1999) due to Emma’s style as a coordinator, rather than a manager.

The monthly meetings and email list were sources of professional learning and an instant support network for the majority of the coaches. Hilary, a part-time coach at Red Gum College, described this arrangement as follows: “There was a group of other elearning coaches and network-based coaches who met regularly, once a month. We also communicated online through email”. She described the multi-faceted collaboration that occurred between the coaches: “It was a very powerful experience to collaborate with everybody. New ideas, people went off on PD and then took that PD back to the meetings. There were lots of ideas, lots of excitement generated all the time”. Through their involvement in the Project Team, coaches were “exposed to new things and new ways of doing things” (Hilary). Sylvia, a network-based coach, echoed this description of the Project Team’s interactions:

Having such a large network of people to touch base with and have great discussions about pedagogy was very valuable. The email list that was set up and the regular meetings we had, the contact with other people, let you just coast along but challenging each other and the way we were thinking.

The elearning community had a listserv and access to the global email address book to continue collaborations and learning amongst the coaches themselves. Skype was also used. Online communications can be convenient continuations of professional learning and collaboration initially established face-to-face (Downes et al., 2001). Celeste, a coach at River College, indicated that “being part of the elearning community group, our meetings were often professional learning and professional development”. This collaboration was seen as something that was needed in the enterprise of coaching ICT: “It came varied, and often, and it was a fantastic opportunity. You need it for the sort of environment, when you’re coaching in ICT” (Celeste). Having a group of coaches who could draw on each other for support and help brought new perspectives to what they were doing in the schools they were based at and met some professional learning needs of the coaches.

Coaches indicated a sense of membership in a community of practice when describing their engagement. Membership of, part-time coach at Red Gum College, Hilary is indicated by the comment: “*We were part of a group* of people that went across various schools in the community” (emphasis added). Celeste, a coach at River College, enjoyed the collaboration: “It was good *being part of a team*, it was a reasonably collaborative team. We did it face-to-face, but we also did a lot of online collaboration as well” (emphasis added). A shared repertoire was formed around supporting the broader project aims, with a focus on brokering ideas across the schools to support technology integration. The coaches developed shared repertoires around the enterprise of brokering, such as drawing on each other for immediate support through the email list and Skype. According to Tanya, a part-time teacher and part-time coach from Manna Gum College, the elearning community meetings were “always really interesting and very helpful in terms of getting a sense of what other schools were doing in terms of drawing ideas and getting

feedback on what we were doing and how we could strengthen it”. There is evidence that a community of practice formed between the coaches in how they described their engagement at the monthly face-to face meetings and communication through an email list.

The structure of the project allowed the coaches to work with the other schools closely, particularly the network-based coaches. Tanya, a part-time teacher and part-time coach at Manna Gum College, expressed that it was great that network-based coaches could be called on for help with things school coaches were not sure about: “Emma [project coordinator] and you guys [network-based coaches] were all really helpful and always willing to come in and give us a hand with a project that we were not sure about”. Sylvia, a network-based coach, described some of the ways coaches worked together: “collaborative projects, presenting as a team in professional learning and we did keynote things together”. Celeste, a coach at River College, also described the other collaborations in a similar way: “We also worked outside the school with network-based coaches as well, and other school-based coaches delivering professional learning, meetings, and planning, keeping ourselves up to date, our own professional learning”. The support and collaboration between coaches were able to occur outside the set meetings. These collaborations were initiated by the coaches seeking out each other and this is further support that the group was operating as a community of practice not just a project team.

Collaboration at a deeper level sometimes occurred between network-based coaches and school-based coaches when they were based in the same school. Network-based coaches changed their base school location each year. This seemed to help develop closer relationships with the school-based coach at that location. Celeste explained that “We had a couple of network-based coaches placed in the school. That was quite a close partnership”. Celeste and the teachers at her school were also proactive in reaching out to the other coaches: “Otherwise, I would invite

network-based coaches out to the school, or other teachers would and they would pick up special projects, or areas of their expertise”. By inviting other coaches, she is understood her role as similar to that of a “technology steward” in “bridging organisational boundaries” of the school (Wenger et al., 2009, p. 30). The success of these collaborations seems to be due to the group being “quite a strong and interesting team to work with” (Celeste).

Hilary, from Red Gum College, who was new to coaching and teaching, mentioned working closely with the network-based coach (myself) who was positioned in her school for one year: “In the first two years, I worked with a network-based coach, which was you, and from my point of view that opened my eyes”. She expressed that “I really needed to learn a lot from my network-based coach. You had a lot of ideas and a lot of energy, and I learned a lot from you, Pennie. I really did”. Hilary explained that from this exchange, she shifted her thinking: “I went in there thinking it was all about, it was about teaching skills, and came out thinking it was much more than that, much more powerful and much bigger. I did not even think about students in the first instance”. The structure of the network-based role to move base schools each year within the network gave the opportunity for closer relationships to form with the school-based coaches.

The two different roles within the group, network-based coaches and school-based coaches, allowed different levels of engagement and knowledge sharing between the coaches. Julie found, “As a network-based coach, working with the school-based coaches was integral”. She talked about the network-based coaches and school-based coaches’ relationship as a “two-way street” offering benefits for both in their different experiences and knowledge. Julie described the variation in the knowledge of school-based coaches and network-based coaches in terms of the different understandings achieved in the different roles:

Some of the stuff they were privy too, as a network-based coach, you were not always privy too. Keeping the collaborations, the links going with all the learning coaches was essential. Having the floating staff like the network-based coach role kept the seven schools in the loop and kept us abreast of where we were going.

Julie also saw her role as a network-based coach to “support the school-based coaches in their schools”. Examples of the support were “to collaborate with others to write curriculum, to utilise new technology such as electronic whiteboards, GPS units, digital cameras, and data logging machines, anything that was trying to be integrated into the classroom”.

Hilary, a part-time coach at Red Gum College, maintained her enthusiasm in talking about the benefits of the coaching group: “People helped each other. We gave PD to each other. We went to each other’s schools. It was highly collaborative and highly supportive. It was fantastic”. She also benefited from work “with that group of people across the different schools”. Hilary in particular was enthusiastic about the collaboration between coaches but also with the teachers in her school. In response to the topic of collaboration, Hilary replied, “Did we collaborate? That is all we did! [laughs]”. The community of practice that formed between the coaches meant that network-based coaches were able to share a meso level of understanding and school coaches were able to share the micro level happenings within their schools.

Even coaches who did not engage regularly face-to-face outside the meeting times still found the group beneficial. Ben, a network-based coach for just six months, reported that “We did not see each other all the time, although we certainly saw enough of each other to get ideas off each other and just find out what each person was doing and specialise in our own little area”. When Annette, a coach at Ferny College, was asked about her work with other coaches, she

explained that she “probably did not work as much with them, mainly because they were all involved in their own schools”. However, the connections made were strong enough that coaches “used to collaborate online obviously, probably every day, using Skype” (Annette). Louise did not work closely with other coaches on projects at her school, but valued the meetings, where coaches “talked about things that were really, useful”. She appreciated understanding “what other people were doing in different schools and how different schools were handling things”. William, a part-time humanities teacher and part-time coach from Manna Gum College, indicated that his work with other coaches was limited: “I did not do much with other coaches and the managers as such, mainly providing resources”.

While the Project Team did form a community of practice, some coaches may not have had a centripetal membership and remained on the periphery. Coaches only met formally on a monthly basis, however, they still maintained the joint enterprise of sharing and supporting the nexus group enterprise of coaching by knowing what was happening in the other schools. Even for the coaches who did not collaborate with others much outside the meeting structure, there was still peripheral membership and benefit from knowing what other schools were doing.

Ben, a network-based coach for six months before taking the ICT leader role at Ferny College, commented that due to the seven schools coming together: “It rapidly expanded the network of people that you had access to, particularly being a network-based coach, as you were travelling around to all the schools”. Celeste, a school-based coach at River College, described the initiative as “a group of coaches and network-based coaches with a leader working across seven schools to bring the staff and students along on their very exciting journey into the use of ICT in education”.

Jenny, a part-time coach at Red Gum College, reported that being part of the project team meant she got to meet people with a wide variety of experience. Jenny talked about the benefits of being connected with other coaches:

Being part of the elearning community team gave me the opportunity to meet with people who have had a wide variety of experience. Meeting with other coaches, and network-based coaches, and Emma as project coordinator. There is a wealth of experience and knowledge that we were able to share there. It was always good to be able to meet together and just share the things that were going on, and new projects we were working on, and difficulties that we faced. Collaboration was one of the things that really brought about the success of the project.

Jenny reflected that “collaboration ... brought about the success of the project”. The way the coaches were able to share the problems they faced together brought them together strongly as support for each other. The benefit of the “wealth of experience” in the group helped coaches fulfil their role of skilling up then brokering ideas back into their school.

For some coaches there was a synergetic effect within the group in learning together, learning elsewhere and coming back to share new ideas again. For others it was beneficial to know what others were doing. Not all coaches met face-to-face often outside the meeting times, but they had sufficient reciprocity to think it would be “obvious” (Annette) that they communicated every day online with one another. The coaches who participated in this study were positioned to have the potential to broker, as they had multimembership: in the school they were located in, in the central elearning community group and in other groups. Hartnell-Young (2006) reported that “brokers are those people—teachers, principals, researcher, and students—

able to make connections across communities of practice and open new possibilities for meaning” (p. 465). The main source of knowledge and ideas for coaches came from their membership in the nexus group.

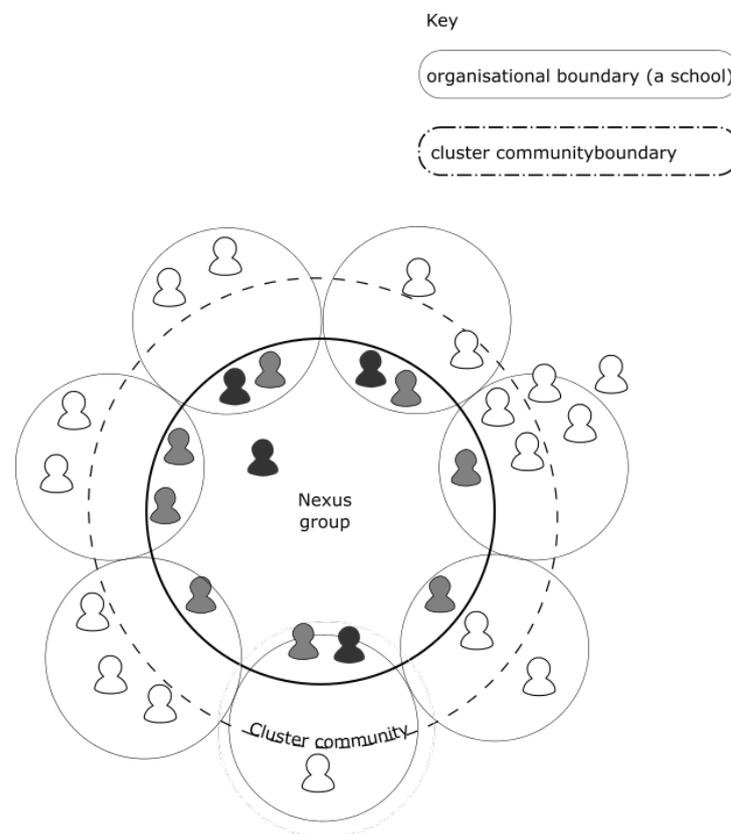


Figure 24. Nexus Group in a Cluster Community

The coaches acted as brokers with multi-membership in their own community of practice and in communities of practice with the leadership staff and teaching staff groups. Wenger posited that “participation” and “reification” happen as connections are made through multimembership, where a nexus of perspectives creates continuities across boundaries (Wenger, 1998, pp. 104–105). The coaches had the benefit of a nexus of perspectives. In the case of their nexus group, it could be argued that this had the characteristics of a community of practice but

this is not a prerequisite for the concept of nexus to apply to a group formation with this kind of function. The nexus group configuration is depicted in Figure 24.

This section has discussed the nexus group of coaches in the elearning project. The coaches developed shared practices around the enterprise of brokering ideas across the schools. Many coaches also had membership in communities of practice within their own schools. The term nexus group has been developed to describe the Project Team. A nexus group has been defined as having the functions of supporting a community's goal and brokering ideas across the community.

8.2 Coaches Connected with Others and Avoided the Hazards of Brokering

In the last section, the nexus group of coaches that supported the joint enterprise of the cluster community has been discussed. In this section, the ways coaches avoided isolation by connecting with others is discussed. Some coaches had the benefit of having other coaches in their school if they were part-time. Some coaches formed close relationships with the teachers in their schools.

The two part-time coaches at Red Gum College felt they had the best situation in sharing the job because, in the words of Hilary, "it is very helpful when you are trying to instigate a change in a school, because you need to bounce ideas". Jenny, the coach who job-shared with Hilary, also reflected this sentiment:

Job-sharing with Hilary, since we were coaching together, that was just invaluable. It was amazing. We complemented each other quite well. It was fantastic to be able to just

support each other in coaching, to be able to set goals, and to carry out the coaching process and then reflect together. Both of us really benefited from that.

Hilary was aware what it was like to do the job alone because when another person had been in the role for six months and then there was a gap before Jenny came on board. She indicated her uprootedness in this way: “sometimes you feel a bit alone, like you are pushing a barrel uphill”.

Jenny also noticed the difference when she had to do the role alone: “I certainly noticed that once she moved on and I was just coaching on my own, it was a lot more difficult to stay focused, and to be as effective as I was”. She went on to say:

Actually, what Hilary and I had was probably the best situation. I know some of the coaches found it really quite an isolating position to be in—to be one coach at a school trying to push your own agenda. Hilary and I had a really good situation so we were able to support each other. You actually need support yourself as a coach. I do not know that the meetings that we had were probably regular enough for some of those people. We found that we had support between ourselves.

Where Jenny shared her understanding that “some of the coaches found it really quite an isolating position to be in” this corresponds with what Wenger (1998) described as “uprootedness”, a potential “hazard of brokering” (p. 110).

Collaboration is a frequent theme in the data. Tanya, who was also new to teaching, had the benefit of being a part-time teacher and part-time coach at Manna Gum College with two other part-time coaches. Tanya was able to work with the two coaches located in her school and

the coaches from other schools, and spoke about the importance of coaches collaborating and sharing with each other:

Absolutely it was a collaborative effort. Working with the other learning coaches at this school, working with learning coaches in the network, going into other schools and seeing how they were doing things, working one-on-one with teachers in their classrooms. It was very much about collaboration and about a lot of learning on the job, because I certainly did not feel like I was an expert in any sense of the word. There was a lot of learning from everyone else. Sharing those ideas and working together with people was really what it was about.

Jim, a part-time coach and teacher at Wattle College, worked with many of the coaches. In the following example, he described his work with a network-based coach Sylvia:

I did a lot of work with Sylvia in particular, setting up web material and uploading the CDs to the website originally. It was interesting working with someone from a graphics point of view and it was good to get the feedback from her, and also to see how someone with that sort of mindset worked in the IT world. It was good working with someone outside of perhaps my normal field of expertise, which I really enjoyed. I have done some work with Jenny also a fair bit, which was good.

The example given here from Jim indicates it was valued by many coaches to have access to a group of people with a variety of areas of expertise.

Peter, a part-time teacher and part-time coach at Wattle College, also worked with other coaches including Sylvia. They had a common background in art education. He explained:

I did a bit of work with Sylvia with some of the things she was working on. Mainly with the network-based coach, it was a matter of passing information and getting information back. There was some communication there, but very little direct work with them. I certainly worked a lot with Jim. He and I worked quite a bit on a range of things and particularly in terms of in-servicing staff here. I also worked a little bit with Celeste and with Robert over at Banksia College. We did a little bit of work together on things there, particularly on some of the presentations we did for the elearning community group.

Peter indicated his work with network-based coaches was limited compared to his collaboration with the other coach in his school, Jim.

Robert, a coach at Banksia College, specifically mentioned working with the coach from River College, Celeste, network-based coach Julie and Ben (who had been a network-based coach at Banksia College and was later appointed as ICT Leader at Ferny College): “Celeste at River College, we shared a fair bit of stuff. Not exclusively. Julie a fair bit. As far as other teachers go, Ben at Ferny College”. Robert collaborated a lot with others:

Extensively informally and formally through either PD or through the elearning community network. There would be people that you would just consult all the time via Skype, and the normal communication methods, to share stuff.

Robert found sharing with other people doing the same job was beneficial: “It was a bit of a privilege to have the opportunity to share with other people, either classroom teachers or other people doing the same job as me across other places”. The positive attitude of feeling fortunate as a coach was also a theme in other interviews. This will be discussed further in 8.5.

Sylvia, a network-based coach, made the comment that the network-based coaches worked pretty closely together at times:

As a team of network-based coaches, we worked pretty closely at certain times. We had quite different focuses, but we had to work together on a lot of different projects in various combinations depending on relevant skills at the time and things like that. Working with the learning coaches most closely with the schools that you were based at, like Eucalyptus College. Then in preparation for things like the conference. Most of the work that I did with them would probably relate to professional learning of some kind, whether it be conferences or running the PD that we did.

Importantly, the nexus group was a source of ideas and learning due to the diverse skillset of the coaches. Sylvia noted that:

It was interesting to have a group of people, about 14 people together, that have very different experiences in training and skills, and it gave you a pool of people to network with. I guess some of the most valuable people collaboration was just contact over Skype saying “What is the best way to convert this file?” or “Do you have any information on this?” Just that team approach to problem solving was really handy.

The culture of supportive collaboration between the coaches was invaluable to meeting the goals of the community. Coaches who identified strongly with the nexus group of coaches discussed in the last section were less isolated than those who did not.

8.3 Coaches' Work can be Strengthened by Leadership

The coaches' work was strengthened when leadership supported their work. Each school in the project was funded for the equivalent of one full-time coach. Each coach was appointed by the individual school and reported their work to that school. There was also leadership direction provided by the project coordinator, Emma, who was "directly involved in the appointment of the network-based coaches", and one technical staff member who directly assisted the project. The coaches employed in the project came from diverse backgrounds and had complementary strengths. Project coordinator Emma said:

This was a structure that I do not think had been done anywhere else that I was aware of, certainly not in Victoria. The learning coaches were of course appointed by each of the individual schools, and so what we tried to do was put together that team of people, and certainly the coaches and the network-based coaches worked very closely together, and of course the network-based coaches as a team themselves. It was really interesting over time to watch how those relationships between people developed. I think I worked really well with all of them. I did not take a top-down management style. It was the team itself that I suppose worked out the strategies that we were going to use to implement certain parts of the project. I developed really strong relationships with the coaches and the network-based coaches, and the unique set of skills that came out of that set was just phenomenal, it just grew year after year after year. It was a wonderful working relationship.

The importance of professional learning for coaches was expressed by Celeste: "We attended our own professional learning. We'd go off and do formal professional learning, and that was

fantastic. It was essential, it was a sort of area you really needed to be thinking and learning about all the time”.

A structured and targeted approach to engaging coaches was described by Glenn, teacher leader at Red Gum College:

We set up a fairly structured way of working with our learning coaches. I met with them about once a week and we quite specifically targeted certain staff, and ... certain projects. We implemented compulsory meetings with learning coaches, which I think worked really well and helped to really ingrain them in the school culture. We still actually have one of our learning coaches working with us now, so we've kept them on because we've seen the role is so useful. We had probably less contact with the network-based coaches. They worked on the bigger projects behind the scenes, I think.

Red Gum College sustained the employment of one part-time coach beyond the project funding period, according to Glenn. This indicates that the school valued the coach position and the leadership supported this by allocating school funds to the role.

The support from strong leadership had an impact on the work Jenny could do as a coach. The excerpt here raises some interesting issues around mandating practices in schools. Jenny explained how the leadership mandates impacted her work with teachers:

The other thing is just the directive from leadership, and we have had very strong leadership at our school. Our principal has really been a great advocate of progressing in elearning, and that is certainly helped my job as coach because when that directive comes

from above *I can come along as a hero and rescue people and help them out*, and help them to move forward to meet the goals of the school. (emphasis added)

Jenny was able to adopt a new identity as a hero to help people out with the directives coming down. She could negotiate how to succeed with the teachers so that they could achieve alignment with these directives.

The impact of leadership was mentioned by Celeste, a coach at River College. She described a period of instability in that the school “had something like three or four new leaders over a short time”. Through this experience Celeste understood the importance of leadership in such initiatives and noted the laptop program worked well when leadership and technical support was stable: “While we had an ICT leader in place, and one technician in particular, it worked really well across the school”. Celeste identified a number of factors that were important to the success of the project aims:

You need good change management processes, leadership with commitment, ownership of the materials, and you need really good infrastructure. Schools need great infrastructure to run a project like that really well, and maybe more technical assistance.

These issues are similar to those identified by Arikan (2005), who concluded that “Federal policies should be cognizant of early childhood educators’ needs to access to technology and information, and supportive leadership structures that stimulate teacher’s motivations to learn and use technology” (p. iii).

Ben was in the middle leadership position of ICT Leader after being a network-based coach in the project for six months and commented about the difference in role:

Within the school too, it was a very different role being the ICT coordinator and being a network-based coach, because we are more accountable to the school that we are working in. I would have a different focus second time around. I would be putting in more sustainable processes. Instead of flying in, doing a session on this and doing a session on that. It does not get you anywhere. You have got to work with your leading teachers and your principal team to actually put in place time, structures within the school, your planning time, your staff meeting time and all that sort of stuff. I would be putting far more attention into that than just saying “Well, here is a computer and this is what I want you to do with this, and this is our wiki and this is a blog”. It is like an iceberg, you know, the actual technical stuff and all just is a tiny fraction. Unless you have the support and the structures within the school to support, it’s not going to go anywhere.

Without leadership support for making time and putting structures in place, it is not possible to make much of a difference in teacher practice in integrating technology in the classroom.

Some coaches reflected that being exposed to formal training themselves around coaching and having better defined roles would have helped them in the beginning to not need to work things out themselves. As coaching was the main focus of the work, Celeste, a coach at River College, reflected that more formal training earlier would have been useful:

The first way I would improve it would be to add structure to the coaching process. What I like about the coaching process now is that we get a commitment from a teacher when they want to work with us, and they meet with us once a week to plan and set goals, and talk around a range of things, and then we work with them once a week as well in the classroom. If I’d had that formal structure, then it would have pushed the elearning and

ICT knowledge and use in school along a lot further. Because what happened was that teams would drift in and out of it as they felt inspired, or the need, or whatever. If it had been more of a formal commitment, it would have scooted along further. Now in saying that, I think that when I first went into the school, the staff were highly suspicious of what a coach was and apprehensive. It took a year for them to really get over that. So it might not have worked initially.

Schools had access to teaching and learning coaches after this project and Celeste, a coach at River College, moved into one of these literacy coaching roles, so this is what she referred to by “the coaching process now”.

Celeste, a coach at River College, also reflected that it would have been useful to have training around coaching during the time of the project:

We did not do any professional development around coaching. It would have been really good. I have done a lot this year, and I would have liked to have had some of that knowledge then. It would have made a big difference. The role was primarily coaching, and because I have done quite a lot of work with adult learners in the past, I suppose I found coaching a reasonably easy thing to slip into, and it came naturally to me. I really enjoyed it. That would be formal and informal. I would spend—sometimes it would be a lesson a week with a teacher, or it could be minutes here or there, it varied considerably. It was the basis of the majority of my work.

Jenny and Hilary participated in coaching course funded by their school at the near end or after the project finished. Jenny described their participation: “It was a five-day course spread over a

few months. Very intense, it was not easy but we certainly learnt a lot from that”. Jenny elaborated:

One thing that would have been helpful would have been to have done a coaching course. Hilary and I took part in a five-day coaching course, and that was fantastic, really good learning. If that had been a priority in the elearning community project, money spent on pretty good training for coaching rather than us figuring it out for ourselves, perhaps that would have made better use of our time and our skills. We really had a very successful setup, the way it was.

Annette felt that it was problematic not having a systematic approach to implementing a learning management system. She said, “We should have had some sort of implementation plan”. To address this, Annette would have “done some sort of project management”. Annette felt that project management would have assisted with a strategic plan:

I would have maybe had the year ahead of me and decided what functions we were going to use. Instead of trying to use everything that was there at once, start off with one little piece of the learning management system, get everybody comfortable with that, and then move along, and of course the learning management system was changing as we went along. There were bits being added to it constantly and I do not think we’d mastered the beginning bits either.

This example above illustrates Annette was learning about leaning management system implementation and the kind of support and structure by way of a plan for implementation that would have been helpful.

Leadership could support the work of coaches by working with them in shaping their role in the school. One teacher and two coaches talked about how the work of a coach could be better defined. One teacher, made explicit comment about how she thought the role of coaches needed to be better defined:

Certain roles really needed to be more well defined. It is very airy-fairy. The school has to take some responsibility for that too. Without some people having direction, a lot of people did not do very much for a quite a period of time. They did offer a lot as well, but [omitted] for example, I would ask her for help and I was told to Google it.

There are two aspects to address in this quote. Firstly, it was unclear to the teacher what the parameters of the coach role were. Leadership could work with coaches and teachers to help with these understandings. Secondly, the issue might lie with a problematic interaction between the teacher and the coach. Clearly being told to “Google it” was not the answer that the teacher was looking for. Further discussion of the qualities and attributes conducive to the coaching role are discussed in 8.5.

It is important that leadership makes the time to negotiate with the coach their role. The role of a coach was new to the schools. Louise, a coach at Eucalyptus College, found it frustrating that her “role within the school was not clearly defined”. The main frustration was being seen as a technical support person. In the words of Louise, “I had a vision of it one way initially but, well, most of the time people saw me a technical resource rather than as a learning resource, so I found that difficult”. The role of the coach was left open so that the needs of individual schools could be met, but it was clear that coaches were not meant to be extra technical support people. The coach role was to be curriculum focused. The problem for Louise was that the main need was for

assistance with using the technology, not curriculum concerns: “I know we deliberately left the role open so that it could evolve into what the school needed and perhaps that is what they needed, but it was not what I wanted to do”. She acknowledged that this occurred “out of necessity”. But for Louise the downside was “not enough of actually changing what was happening in the classroom because we were too busy trying to technically get things to work”. Louise reflected on the challenge of having a loosely defined role in that she could end up being more like technical support than coaching in ICT in the curriculum. This is an area that could be addressed through school leadership in preserving the role as a teaching and learning one, and providing other technical support.

Tanya, a part-time coach and part-time English teacher at Manna Gum College, would like to have had some more clearly defined goals:

This was not necessarily a reflection of the project, possibly was just part of my school, but if I’d had a clearer sense of what we wanted to achieve and how we were going to measure that, I would have felt like I had been working towards that and it would have probably made it more rewarding for me. Then I could have clearly said, “Okay. Yes, we met that goal” or “No, we did not. We met this goal instead and it was a better goal to meet because that original idea did not work”.

From the perspective of how leadership can support the work of a coach, making time to set goals might have alleviated the problem described by Tanya.

The other aspect that leadership and coaches needed to work together on was having a common vision to scope the role. Tanya shared her insight on the importance of being clear about the vision of what was trying to be achieved:

One of the things from this project that has probably stuck with me the most is the importance of having a shared vision that is clearly communicated, because there were times when, during the project, I really felt like I was not sure what it was I was meant to be doing. That limited, to a certain extent, what I achieved personally.

This example from Tanya indicates that she would have liked closer interaction with leadership in her role. These examples correlate with the theme of role confusion found in Skues and Cunningham's (2013) study. In their study, coaches were also confused with being a technical person. Again, because the teaching and learning concerns could not occur without the technical aspects having already been addressed.

The work of the coaches could be supported by school leadership with structures and opportunities for coaches to learn. Some coaches would have liked formal training and structures to support their work. Examples here indicate that leadership could work with coaches about the vision and the job role. This section has addressed aspects of how leadership supported or could support the work of a coach. The next section describes the reciprocal learning relationship between coaches and teachers.

8.4 Coaches Learned From a Reciprocal Relationship With Teachers

Coaching teachers was a reciprocal relationship and a source of learning for the coaches. The teachers and coaches were learning together. The coaches generally had an aptitude for

technology use, allowing them to stay one step ahead of the ever-changing technological landscape.

A coach's repertoire was enriched through the privilege of working with teachers. Jenny, a part-time coach at Red Gum College, explained:

As coach, my role has been to support other teachers and that is been a two-way thing. I have certainly helped other teachers in lots of different ways, and sometimes that is in elearning and sometimes just pedagogy. I have been able to learn from the teachers that I coach, and I think it is a two-way street. There are a lot of great things that teachers are doing, and just little things that you pick up along the way. That sort of collaboration with teachers has been really good for me, and hopefully for them too.

A conversation between Robert, a coach at Banksia College, and the researcher revealed that coaches benefited from working with teachers. Robert saw it as a privilege to have the opportunity to see other teachers teaching: "One thing you get out of having the privilege of being a coach is you get to see a lot of other people teaching, and you get to think 'Oh, that is a good idea, wish I'd thought of that. I'll use it'". The implication for Robert was that: "In general, we should be doing more of that. We should be actually just working with each other as teachers. We do not get that many opportunities". This example indicates that coaches learned from teachers but also that it was beneficial for teachers to have the opportunity to observe each other teaching.

Two early-career teachers benefited from learning from other teachers. The coaching relationship with teachers was something Hilary, a part-time teacher and coach at Red Gum College, learned from:

I honestly believe that I helped teachers as much as they helped me. It was all a big mishmash of learning and it was quite an open, unstructured way. In many ways we made it up as we went along. You got dragged hither and thither and some days you did not know what you were doing from the start of the day to the end of the day. We made a lot of mistakes, we learned a lot of things.

Building on this Tanya, a part-time English teacher and part-time coach at Manna Gum, noted, “I have certainly learned a lot from the other teachers that I worked with in terms of how to implement something successfully”. As a graduate teacher in her first few years of teaching, Tanya, acknowledged that she was still a “learning teacher”. She found it “wonderful ... to be able to go in and see other teachers interacting with their students”. Through that experience, Tanya extended her “teacher repertoire”. Being able to go into other teachers’ classroom meant that Tanya was in the privileged position “to get a sense of how different KLAs [key learning areas] interacted with their students”. She considered “how different curriculum ideas could be integrated with what I was doing in my class”. For Tanya, getting the “whole picture of what was going on in our school” opened up the options “to draw on that with my own students”. Hilary and Tanya benefited from learning with other teachers. The examples here describe the nature of the peer-coaching or co-teaching relationship.

Even coaches who were experienced teachers reported learning from teachers. Louise learned in particular from young teachers:

... a lot of collaboration with other teachers in activities using ICT ... both in terms of curriculum and in terms of technically how to use things and how to set up activities using computers. There would be teachers who would know more about things than I did, so I

would learn from how they have used activities. We had a few young teachers who were right into setting up wikis and things like that, which I was not at the time, but they were happy to go along with that and show me what they were doing. In that way I learned a bit from them as well.

Even experienced teachers such as Louise learned from other teachers. In this case, the other teacher was a beginning teacher. This is important because it should be recognised that teachers with differing experience can learn from one another. Coaching was a reciprocal relationship that the coaches learned from.

This section has discussed finding 18 that coaches learned through their reciprocal relationships with teachers.

8.5 Coaches Developed Their Relationships and Legitimacy

This section presents finding 19 that coaches developed their identity through approaches conducive to positive relationships and legitimacy.

There were coaches who “thrived being in the role” similar to that described as a “broker”. This is true for many of the coaches who worked in the elearning community. Hilary, a coach, thrived in this kind of role:

I do not think I realised how powerful and how much it was changing me in every way. I am a problem-solver. I am a natural try-things-out kind of person, and drag the kids with you. In my new school, I am still acting as a learning coach. Without realising it, people

are coming to me and asking for help. I am sharing ideas and dragging teachers into my class. It is great. The maths department love me.

Hilary kept the identity of a technology steward or coach even after she went on to teaching as a job after the coaching role. Her identity changed during the role and this is evident in her saying “it was changing me in every way”.

There are examples of how coaching became part of some participants’ identity. Robert, a coach at Banksia College, was also a coach who kept his identity as a technology steward after the project role concluded. When asked about collaboration, Robert expressed his experience in this way: “Heavens above, where do you start? That is all I did for three and a half years. I do it all day every day now too. I’m still the go-to person”. Robert expressed that even though he continued in his school in a teaching role, he was still “the go-to person”. Robert kept the identity of a technology steward even though his formal role did not require him to. Tanya, a part-time teacher and part-time coach kept her identity as the “computer girl” after the project finished and she resumed as an English teacher. Tanya found her place in the school through her development of this identity: “it gave me a place in my school that I would’ve probably had to work a lot longer to get to, because I felt like I was an integral part of something new and something people believed in and they wanted to work”. The coach identity was linked with being the “go-to” person or “computer” person.

French teacher from Manna Gum College, Diane, described the development of a relationship with school-based coach Tanya: “I probably would not have had much to do with her and, because I got her in to help me, I built up the relationship with her”. She appreciated the support in the classroom: “She came into a couple of my classes where I wanted to do something

with Photo Story, so she came in and explained to the kids about Photo Story, how best use it, so that was fantastic”. Diane “liked” Tanya and was able to build a relationship with her. Tanya was able to help Diane with what she wished to achieve in the classroom and so the coaching relationship was successful.

The importance of forming good relationships is a recurring theme about effective coaching. The most important factor in coaching, according to Jenny, a part-time coach at Red Gum College, was a trusting relationship, as explained here:

I have really come to realise that in coaching the most important thing is to develop a trusting relationship. I have really had to work at just spending time with people, getting to know them, and letting them know that I just value them as people, and then as teachers, and then being able to support them in their own learning.

Part of building a trusting relationship is not judging people. Jenny explained the insight she had gained in her experience being a coach: “That is just a huge realisation that people do not want to be judged. They do not want to be told what to do”. Jenny realised the best approach for her was “tactfully figuring out each person, each personality, finding ways to really target them and to support them”. This realisation that people do not wish to be judged has implications for coaching programs. Coaching set up as a peer relationship, rather than the coach as the expert there to make a judgement, might be more conducive to building a trusting relationship.

Overall, Jenny worked with a cohort of teachers on a range of activities, including planning and in classrooms, to enact the newly planned curriculum. She also hoped that teachers were able to then reflect on the learning to be able to build on it:

I have found that there is certainly a cohort of teachers that it is been great to work with, and to do some planning with them, and then work in the classroom with them to enable the implementation of whatever we've planned. Hopefully, then to actually spend some time reflecting later on, to actually build on the learning that the teachers had.

The teachers interviewed indicated that they had good relationships with their coaches Jenny and Hilary at Red Gum College. Teachers want to share emotions as well as knowledge in the practice of their learning (Hur & Brush, 2009).

On the other hand, the approach taken by Jenny with those who just did not want to be coached was to leave them alone. She explained her approach and realisation that some people want to learn in another way:

There are some people who just do not want to be coached, and pretty much I have just, once I have figured that out, I have left them alone, and there is no point wasting time with people who just do not want to be coached, and that is fine, that is just their way. They want to learn for themselves in another way.

The point made here is important. Coaching is not the answer for every teacher's professional learning needs. This may be because the coach and teacher are not suited for the learning partnership, or the teacher just may not want to work with a coach at all.

Annette, a coach at Ferny College, felt "lucky" that she became a coach in the school she had been teaching at because she had already formed relationships with the staff:

I knew the staff really well and they knew me and trusted me, so that when I went in I did not have to establish relationships. I already had relationships with most of the staff, so I think that makes a big difference, to have someone they can trust and they knew they could trust me. I'm very patient and try not to be judgemental and try to be approachable.

After the project finished, Annette became a coach in another school that was not part of the elearning community. She reflected on the contrasting experience of being new to a school: "It is not as easy as being in a school that you know and you know the culture of the school and the rest of it". Annette was able to reflect on the value of having the pre-established relationships that she had in the school in the elearning community in hindsight, once she was coaching teachers in another school where she did not have established relationships after the project.

Celeste, a coach at River College, mentioned that variation in the needs of teacher learners required different approaches:

Most of my job was working with other teachers. Their skill level and what they wanted to do varied enormously. It could be from absolute beginners, who were just wanting to know how to use Microsoft programs and their email, through to really high-level users, that would be very brief talks about small things just to confirm something, or inspire them, or even vice versa. It was a two-way thing when they are working at that level.

The different kinds of technologies included "software, hardware, web 2.0 technologies, it was just a range of stuff that they would have over this technology in the classroom. As you know, we did GPS units and interactive whiteboards, and it was really diverse" (Celeste). There was variation in the engagement with different teachers, according to Celeste: "Some relationships

with teachers would go on all year, some would be just-in-time stuff and short bursts here and there”. The change in teachers’ confidence due to the support was explained by Celeste:

One of the things I would talk about is how nervous and scared some of the people were originally, and what a great way to get people to change what they are doing, to have that sort of support, rather than sending them off to half a day here or a day there. With that ongoing support and learning around relationship building, which is where we all know, a place where meaningful learning takes place.

Celeste shared the insight that “learning around relationship building, which is where we all know, a place where meaningful learning takes place”. Visiting experts could not achieve this in the depth of relationship or the ongoing relationship she described. Celeste encapsulated the premise of Wenger’s (1998) social learning theory in which communities of practice is situated.

It is important that coaches are able to relate well with and develop personal relationships with teachers. It is necessary for coaches to have skills; however, these skills or abilities are lost in practice if the relationship foundations are not working. This important idea that relationships are the key factor in the learning partnership was expressed by teachers, Lewis, an English and literature teacher from Red Gum College, and Yvonne, a science teacher from Wattle College. Lewis found variation in the usefulness of coaches. There were two in particular he enjoyed working with. Lewis found the coaches who were actually working with people to be good:

Not all learning coaches are great. Probably fifty-fifty from my experience have been actually really helpful. Some learning coaches have sort of just gone off into the school

network and tried to change things there, whereas the good ones have actually worked with people.

Lewis continued with the following reflection on the changes in his identity over the time in the project that were a result of working with the coaches:

To be quite honest, Pennie, I was a real sceptic, as you know, always have been, about the usefulness of over-ICTing everything. So if anything I'm probably less of a sceptic now. I think that there are lots of useful tools, so in that way it definitely brought one grumpy old sod around!

The coaches who were useful were able to bring "one grumpy old sod around". Lewis had shifted his identity and was less of a sceptic about ICT.

Setting up technology projects without upskilling teachers themselves was not considered useful. One teacher expressed that one of the project staff "was not useful". This was in the context of a coach setting up the technology to run a project that the teacher did not know how to do themselves. Generally, the teacher self-assessed as "my skills are quite good", but felt they did not get enough explicit support in the setting up of the project. The teacher felt that if the coach did not teach the skills required, then curriculum would not be sustainable in future years: "I did comment to her that unless she was here in future years we would not be able to use it, and could she show me how to do it ... but she did not do that". Lack of follow-through on requests for assistance had a negative impact on the coaching relationship. This teacher was far from impressed in being told to "Google it". The dissatisfaction for this teacher with the coach was followed up with a suggestion of what coaches needed to be:

She was not proactive in her role at all. It really required people to be proactive if they are in that role. “How can I help you? This is what I have got to offer”. None of that was happening. She just stayed in her office. She was definitely skilled up for it, but personality-wise probably the wrong person.

In this example, the coach did not gain legitimacy with this teacher. The teacher was willing to work with the coach initially, but the arrangement did not meet the teacher’s needs. The two examples presented here show that the relationship is of primary importance, regardless of the level of inclination towards technology use in teachers. In the scenarios presented here, one teacher self-identified as a Luddite and the other as having good skills. Another teacher also was not impressed with a coach just moving files around and not working directly with teachers. These examples suggest that it is important for coaches to be receptive to how their actions might be perceived by teachers. The relationship between them is paramount in the learning partnership of coaching.

Two coaches in particular really enjoyed their role and offered reflections on their own practice. Hilary, from Red Gum College, described what it took to meet the immediate needs of teachers:

Sometimes people said they needed an idea for the next class. Or “What you think about this?” You try and explain to teachers that you need a little bit more time than that to do it well for them [both laugh] but the fact that they came to you— you see that as a gift and you try and work within that. You have to be prepared to do whatever it takes, whatever hook you can to get the teachers and students using it.

Hilary perceived the request from teachers as a gift. This example shows a very good approach for a coach: To be ready at hand to assist and be grateful for the opportunity to be able to assist.

Celeste, a coach at River College, reflected on the experience and expressed the following:

Personally, I have had the most stimulating and enjoying work that I have ever had in my entire life. I have continued to learn and grow professionally at an enormous rate. What a fantastic privilege that is, and I feel very fortunate. That is in so many areas, you know? That is in your elearning area, because it continued to grow, and in coaching, and in how people learn, it has just been huge. It continues to be because I have this lifelong love of learning, I feel like I am pretty lucky. I like working with people too.

The example here captures Celeste's disposition as an enthusiastic learner and coach. She remarked that she had a "lifelong love of learning" and enjoyed learning about coaching and how people learn. The strength of Celeste, as a coach, was conveyed by Carolyn, an English and humanities teacher from River College, who reported: "She was outstanding and we could not have had a better person. She was able to bring absolutely everybody on the staff on board. I cannot think of one person that she failed with".

This study has found that coaches need to be able to establish good relationships with teachers for coaching to be effective. This study finds some people more suited to coaching than others. For coaches to be able to broker practices, they need legitimacy. This study supports that this legitimacy can be achieved by "being the right kind of person" (Wenger, 1998, p. 101). This study finds "being the right kind of person" includes factors that develop the right relationships so as to be able to facilitate the learning with a teacher. This study has also found that "certain individuals thrive on being brokers: they love to create connections and engage in 'import-

export” (p. 109). This study has found that coaches that many coaches exhibited this love for learning and supporting others. The type of person makes a difference in the coaching role. Other skills and knowledge are required for coaching, but they do not translate into long-term legitimacy as a coach who can work with teachers wanting to change their classroom practice. Coaching qualities and practices that support legitimacy and thereby relationships are synthesised in Figure 25.

form good relationships

- be approachable
- work with people (do not be task focused)
- like working with people

instil confidence

- have patience
- avoid being condescending
- do not be judgemental

understand how people learn

- know that people learn in different ways
- know where learners are at an accomodate for this

continue learning

- have lifelong love of learning
- have continued learning in elearning
- have continued learning in coaching

be proctive

- be helpful and avoid being unhelpful
- follow up on requests for support
- be ready with ideas and resources

Figure 25. Coaching Qualitites and Practices That Enhance Legitimacy

This section has described the practices and attributes of coaches that support development of the relationships and legitimacy that are conducive to working with teachers wanting to change their classroom practice.

8.6 Conclusion

This chapter has discussed the ways coaches were supported in their work with teachers. Coaches benefited from engaging with each other around the enterprise of coaching. This helped some coaches avoid the isolation that might be felt by a single coach in a school. Coaches were able to connect with others in the way Wenger, White and Smith (2009) suggested for technology stewards, perhaps even on a developed level in forming their own community of practice around coaching. Supportive leadership was also found to be important to leveraging the work of coaches. Their own professional learning through communities of practice has been highlighted. Coaches may have also benefited from professional learning specifically to do with coaching. Building good relationships was shown to be of key importance in the coaching relationship. There are a number of qualities and practices amongst coaches that contributed to legitimacy and a synthesis of these has been given in Figure 25.

The next chapter is the final one. Chapter nine draws this research to a close with a presentation of the conclusions and implications, limitations, implications for my practice as a researcher and suggestions of future research.

Chapter 9 Conclusion

This research set out with the broad guiding question, “What works in a learning community and why?” This question was refined to explore effective approaches to the professional learning of teachers in the context of a network of schools. In light of the problem of poor integration of technology in the curriculum, this study has explored an elearning community’s multi-tiered approach to professional learning. This study has found that a combination of contextual approaches is an effective way to meet the professional learning needs of teachers in integrating technology. This study has theorised its findings with reference to professional learning literature and communities of practice theory. This chapter draws the research study to a close in discussing its significant contribution to research, the strengths and limitations of the study, implications, recommendations and suggestions for further research.

The schools involved in this research study were engaged in an innovative program to promote the integration of technology into the curriculum at a time when infrastructure and lack of equipment were still barriers. The network of schools received funding to address the basic resourcing issues and to form an elearning community (DET, 2004, 2005a). The Leading Schools Fund project to form this elearning community meant that the schools were bound to work together towards common goals and were funded for technology infrastructure, laptops, a learning management system and, most importantly, 14 coaches. As simply equipping teachers with technology does not mean that it will be used (Hennessy et al., 2010; Hucks & Ragan, 2013; Lane, 2012; McGrail, 2007; Mouza, 2003), this project ensured that professional learning was also provided. Due to the relative ineffectiveness of one-off workshops, this study has focused on

collaborative, community approaches to professional learning that take into account the importance of the social aspects of learning. The professional learning approach explored in this study included a multi-tiered model where workshops were followed up with in-classroom support in a collaborative community setting. The findings of this study contribute to the body of knowledge in the field of teacher professional learning in integrating technology in the context of a cluster of schools.

This study focused on four guiding questions:

1. How does forming a network of schools affect teacher and coach experiences of teacher professional learning in the integration of technology into the curriculum?
2. How do teachers and coaches negotiate large-scale technology implementations of laptops and a learning management system?
3. How do teachers and coaches working to integrate technology into the curriculum experience professional learning within a network context?
4. What factors support the work of coaches in their role to assist teachers to integrate technology into their curriculum?

The next section details the conclusion and implications arising from this study in relation to these four guiding questions.

9.1 Conclusions and Implications

9.1.1 A cluster community

Research question one was, how does forming a network of schools affect teacher and coach experiences of teacher professional learning in the integration of technology into the curriculum? The overarching finding in response to this research question is that cluster community formation positively influenced teacher professional learning in the integration of technology into the curriculum.

Resulting from this study is a definition of “cluster community”. A cluster community is formed where members demonstrate identification with a common purpose and there is evidence of a shared repertoire. Identification with the common purpose of the community was shown by the study participants in describing themselves and their school as belonging to a community. This belonging to a community was part of their identity. There was also a sense of ownership articulated by participants of the common purpose of integrating technology into the curriculum and evidence of shared repertoires that developed. Their understanding of being a community contributed to success in the joint enterprise of technology integration because teachers felt supported in knowing other people were doing the same thing and they could learn from them. Teachers received a common message and language to talk about it with each other. These factors contributed to finding one that a cluster community developed between seven schools and helped technology integration, as teachers were reassured that schools were all working towards the same goal.

The term cluster community has been introduced in this thesis because there was not a suitable existing term in the literature to describe the kind of formation which developed

between the schools during the project. The closest descriptor for the formal and informal networks that demonstrated many characteristics of multiple and overlapping communities of practice was a constellations of connected practices as described by Wenger (1998). Results show that the fact of the schools working together was beneficial to the professional learning of teachers in integrating ICT. The data suggests that what developed was not just a community of interest. Some participants were not particularly interested in the enterprise at the beginning, such as the English and literature teacher from Red Gum College, Lewis.

The project's focus on collaboration was one of the major contributing factors in the development of the cluster community. The clustering of schools and bringing together of principals, leadership teams, technicians and teachers working together at different levels and across these levels towards the same agenda contributed to the initiative's goals. Finding two was that members of the cluster community connected with the broader landscape of practice and this was a reciprocal relationship. This means that knowledge that had developed in the cluster was shared with the broader education community. The cluster also benefitted from external engagement. Finding three, that forming a cluster community between schools was an equaliser and reduced competition between the schools, shows another benefit for the schools and community. Instead of each school working separately on the same goal, resourcing was a shared enterprise.

The cluster community was difficult to sustain once the funding period ended. This idea is represented in finding that the cluster community was sustainable when supported by a funded project, but this was difficult beyond the funding period. A number of examples of potential sustainability were demonstrated, such as some schools inviting teachers from the other schools to attend professional learning workshops and the technicians continuing to meet. But on the whole,

the end of the funding meant the end of engagement for most participants. Therefore, an implication arising from this research is that operating schools as a network offering flexible professional learning including coaching does require an ongoing funding investment. Whether this funding should come in the form of government allocation or whether schools could strategise these arrangements to sustain a cluster of schools with a nexus group of coaches to support technology integration is a question for further research.

9.1.2 Technology initiatives

Research question two was, how do teachers and coaches negotiate the implementation of large-scale technology initiatives of laptops and a learning management system? The overarching finding in response to this research question is that shared repertoires developed in response to large-scale technology initiatives and were negotiated at the local level. Schools benefited from learning from other schools in the network in relation to large-scale implementations and having the flexibility to negotiate the practice at the local level. The shared repertoire of using laptops, the learning management system and the types of curriculum development were negotiated at the school level. This occurred through the participation in and reification of the learning from workshop sessions and working with coaches to adapt the processes and curriculum approaches for their own setting.

An implication arising from this study is that up-to-date technology infrastructure and technical support are a prerequisite for successful technology integration by teachers.

9.1.3 Multi-tiered approach to professional learning

Research question three was, how do teachers and coaches working to integrate technology into their curriculum experience professional learning within a network context? The overarching finding in relation to this is that teachers and coaches experienced a multi-tiered approach to professional learning in integrating technology into the curriculum across a network of schools. Cluster community formation contributed to effective professional learning of teachers. The workshops and professional learning days also contributed to the cluster community formation. Teachers benefited from a multi-tiered approach to professional learning to support them to integrate technology into the curriculum.

This research has made a contribution to the field in detailing what happens in a professional learning community “beyond the rhetoric of transformation that characterizes much PLC ‘how to’ literature” (Servage, 2008, p. 75). The findings of this study confirm the value of promoting collegial, collaborative and coaching approaches to professional learning for teachers. It is suggested that a transformative model of professional learning emerged. There were shifts towards collaboration and in teaching pedagogy.

Coaches offered flexible and tailored professional learning for teachers. Formal sessions followed up by coaching did work for teachers. The coach role in the elearning community that was established to support technology use in the project schools was akin to the role of technology steward. The formal-informal approach to professional learning was successful in three ways:

1. in bringing teachers together in workshops;

2. in having coaches to follow up with teachers one-on-one and in the classroom to bring about change in classroom practice; and
3. in teachers collaborating with other teachers to share their learnings at workshops and within their own schools.

The culmination of these approaches has been identified as a multi-tiered professional learning approach. This multi-level professional learning approach was the key for teachers becoming able to integrate technology into their curriculum. Cluster community formation and a coaching nexus group were important parts of this. Teachers being able to work with a coach after a workshop or to work on their own individual ideas was highly valued. Teachers became empowered to implement technology due to increased confidence. In coaching, building relationships is critical. Coaches were available when teachers needed them and could tailor their approach to the school's and individual teachers' needs. Coaches also brokered ideas across schools. Shared repertoires developed through workshops, coaches working with teachers and teachers sharing with other teachers.

Teachers responded positively and reported a number of in-classroom changes in practices and in their thinking. Just-in-time and tailored professional development and having follow-up from sessions with the coaches were valued. A flow of ideas occurred with seeding of an idea at workshops, showing curriculum examples of how it worked, teachers getting help to try it themselves, then teachers doing it themselves and sharing with other teachers what worked.

An important implication arising from this study is that teachers need time to invest in their learning. This research has found that the professional learning of teachers is enhanced when supported and when flexible opportunities can be tailored to the specific needs of the context and

the teachers across a network of schools. Another implication arising from this study is how a multi-tiered professional learning approach can be supported in an ongoing way.

9.1.4 Developing the coaching initiative

The fourth and final research question was, what factors support the work of coaches in their role to assist teachers to integrate technology into their curriculum? The overarching finding was that coaches developed their practices through support for their own learning and connecting with others.

This research has contributed to knowledge with the development of the term “nexus group”. The nexus group’s function was to support the common purpose of the community. The nexus group facilitated the work of coaches in brokering practices across the network of schools and the creation of new knowledge. The benefit of the nexus group within the cluster community was that coaches were able to broker practices across the schools. There were benefits in having school-based coaches based in each school being able to work with and exchange information with network-based coaches who worked across all seven schools. The role of a coach can be supported by leadership in a number of ways.

Some implications arising from this study are that coaches might benefit from professional learning around coaching, as well as the pedagogy and technology. Coaches also need leadership support and the opportunity to connect with others performing a similar role. Building relationships is critical to success in coaching. This study has identified a number of qualities and attributes that build the legitimacy of coaches, which are the ability to form good relationships, the ability to instil confidence, understanding of how people learn, the desire to continue learning and being proactive.

Although not a precondition for the theoretical concept of nexus group, the data supports that a community of practice was operating between the coaches, rather than just a project team, as described by McDermott (1999). In this study, the coaches formed their own community of practice and this meant they had a ready source of ideas, support, strategies and developed a sense of belonging.

The findings and theoretical constructs developed in this study contribute to the body of knowledge on cluster schools and emerging approaches to professional learning.

9.2 Limitations of the Study

This research is limited in the external generalisability of its findings. As pointed out by Maxwell (2013), “qualitative researchers usually study a single setting or a small number of individuals or sites, using theoretical or purposeful rather than probability sampling, and rarely make explicit claims about generalizability of their accounts” (p. 137). The design of this study as a qualitative case study with a purposefully selected site for its uniqueness of being a group of schools with an agenda of community-focused professional learning means that the findings are not statistically or externally generalisable in the way described by Maxwell. The findings, then, are not directly generalisable to mainstream school structures because the context of this case provided the impetus for a group of schools to work together, as well as infrastructure and staffing resourcing that is not generally available in mainstream schools. There is limited transferability to schools and network contexts where there is no investment in coaches free of other duties.

This study is analytically transferable in describing a cluster community and nexus group function. These findings relating to how professional learning was tailored to a particular context

may also be transferable. Other contexts could use this multi-tiered and situated approach for effective professional learning. It is possible for teachers to broker ideas across schools, but without investment and structures to support them, this impact is diluted.

This study is interpretive and therefore it is unable to defend against not further involving participants in the research process to the degree that action research or design-based research might. The aim of such a participatory study would meet different objectives. The strength of the interpretive approach means a level of theorisation has been possible that might not otherwise have been achievable. The interpretation is strong in terms of the theoretical sensitivity of the researcher conducting the study. Despite its limitations, this study has achieved what it set out to do in clearly explaining a context and inferring understanding about teacher professional development in the context of a network of schools. The strength of this study is the richness of the analysis of the processes that was achieved.

9.3 Implications for my Practice as a Researcher

Implications for my own research practice have also arisen in this study. I have developed my interviewing skills in the process of conducting the 28 semi-structured interviews. When I listened to the recordings, I noticed for instance that on a particular occasion I interrupted the participant during the conversation and this prevented them from expressing what they wanted to say. I reflected that interrupting this participant at a potential crucially moment meant that their contribution was lost, because they may not have picked up that line of thought again on the topic they had been speaking about. Another observation I reflected on was an instance where I interpreted a participant's response literally when they intended a figurative meaning. This occurred when I asked the question, "Were there any technical issues?" The participant replied

“How long have we got?” My literal interpretation led to my explaining how long the interview had been running for and giving an estimated finish time, instead of probing further into the considerable technical issues this participant had faced. The implication for my practice as an interviewer is to relax and listen carefully to try to understand the participants’ figurative meanings.

As a maturing researcher going forward, I will have more confidence in setting the research design to include more sources of data. I was hesitant to ask for too much from the community I had served as an employee. As a result, I did not maximise the scope of the study. The implication for my practice is that I will be more confident in my research design and build a stronger case for the data sources desired, so that I feel more justified in my requests.

In the process of conducting this study, I have developed my understanding of evaluative and participatory forms of research. I had good reason for not engaging in these methods at the time. I think now, given that I believe I have ethical sensitivity, I may be able to develop my practice so as to have the confidence to use these approaches in the future. Moving from novice researcher to early-career researcher status in title and experience will help facilitate this development in my practice. The implication for my research practice in this regard is that I will use more evaluative methods and more community consultation about the research in my approach in future studies.

9.4 Suggestions for Further Research

In this research, I have made some important contributions to the body of knowledge surrounding teacher professional learning. I have also identified a number of areas that are worthy of further research.

This study has explored the views of teachers and coaches in an elearning community project. A further extension would be to explore the views and experiences of the principals of the schools involved in the project. This study did not pursue this because I was hesitant to ask too much of school principals whom I already had to seek permission from. Ellul (2010) conducted a study on ICT peer coaches that included the principals of the schools as participants. A further extension would be to include the experiences of principals in a cluster project like this one.

Some of the elearning coaches in this study, and also in Skues and Cunningham's (2013) study, were employed from within the schools while some others were new to the context. It would be interesting to do further research in this area to ascertain the importance of insider status of coaches as technology stewards being able to emphasise "the practices that a community has to develop to leverage technology" (Wenger et al., 2009, p. 25). This insider status has parallels with the concept of legitimacy. Further work on legitimacy of school coaches with the task of brokering could also be valuable. Fernando (2008) made a contribution to this area in a study of pre-service teachers and this could be explored further in school contexts.

A further extension could be a mixed-methods approach. I would like to have been able to do this, because the combination of quantitative and qualitative methods could potentially strengthen the study (Ferdig, Sprague, Maddux, & Albion, 2007). It was envisioned to use data from the ePotential survey, which was a self-assessment tool available to teachers to determine

where they are on the continuum of technology use. An online survey was also considered but was rejected due to the potential imposition on study participants. Therefore, I recommend further research into cluster schools using a mixed-methods approach.

Due to dependence on the technical setup being functional and robust, another worthy area of research might be to investigate the practices of school technicians. It was reported by the project coordinator that the technician group continued to meet after the project ended. Further research into self-managing groups like this might be helpful to schools in understanding the benefits of inter-school cooperation between people with similar job roles who might otherwise be isolated with one school.

The Australian School Innovation in Science, Technology and Mathematics (ASISTM) case study reports (Tytler et al., 2008) are another area where student experience studies would be valuable. This kind of study would be best done in the context of teacher-engaged research such as inquiry design-based or action research projects. Further research could extend the field of knowledge by including the perceptions of students being taught by teachers involved in a multi-tiered professional learning in contexts similar to the structure of the elearning community investigated in this research. Including student learners as participants in a study of collaborative projects would also be worthy of further research.

Hartnell-Young (2006) suggested that further research could focus on the decoupling of the four roles of teachers. As an extension to this, further research could explore what roles are decoupled in an elearning community with project staff similar to the case in this study. The elearning community decoupled the management of people and resources to some degree, but this was not the focus of the current research.

In chapter two, a deficit in research into professional learning was highlighted in that the programs studied are at most usually only a few years in duration. This study could have offered further insight if I had designed the research to be able to document the experiences of the teachers and coaches from the beginning of the development of the elearning community and beyond. Due to ethical considerations, this study was conducted as a final snapshot of or final reflection about the project after it had been wound up for almost two years. In the case of the research into continuous professional development by Sangster et al. (2013), the program duration was a two-year period and the data was collected by way of interviews after the program had finished. Therefore, further research around strategies supporting ongoing professional learning in the form of a longitudinal study would be worthwhile.

Further research could also extend into a higher degree of teacher participation in the shaping of the professional learning offered to the whole network. Sessions based on the needs of teachers in particular schools were possible. This occurred in the individual schools as the coaches were able to tailor the learning to the staff at their school. However, as reported in the literature review, whole-school professional development does not differentiate the particular needs of teachers sufficiently. The coaches and teachers in this study valued informal, small-group and just-in-time approaches as a follow-up to workshop sessions. The whole-network approach was conducive to inspiring ownership of the common goals and developing shared repertoires in integrating technology across the schools.

9.5 Concluding Statement

Finally, this study has contributed to the development of social learning theory by exploring a case of the professional learning of teachers in integrating technology in the context

of a network of schools using communities of practice theory, and brokering and technology stewarding concepts. This study set out with the broad guiding question of what works in a learning community and why. In this study, it has been found that teacher professional learning in ICT integration was supported by a cluster community formation, a nexus group of coaches and a multi-tiered professional learning model involving a combination of workshops, peer coaching, teacher collegiality and collaborative projects.

This research makes a theoretical contribution to the field of study by providing the new terms cluster community and nexus group to describe a new configuration in a learning context observed as the phenomena of this study. The study has highlighted the benefits of a flexible, multi-tiered approach to professional learning for teachers that included coaching. Further research into emerging structures and practices would contribute to the understanding of teachers as individual learners with complex, ongoing professional learning needs, to support their important work in fostering the education of future generations of students.

Appendix A. Letter Requesting Permission From Principals

Dear Principal,

I am writing to you to request permission to conduct research. I have been working on my PhD at Monash University since 2006 and my research title is Networks Facilitating Change: A Case Study of an eLearning Community.

Your school was involved with the elearning community during the years of 2004–2009. As you may or may not be aware, I worked as a network-based coach for this Leading Schools Fund project.

This project CF09/0980: 2009000476 was given Monash ethics approval on 30 April 2009. It has also been approved for me to approach you about this project by DEECD on 29 July 2009.

This PhD thesis is being supervised by Dr Bernard Holkner, Centre for Educational Multimedia, Education Faculty Monash University, Clayton Campus.

In this research, I will interview teachers and educators about their experiences in the development of an elearning community. Using a qualitative case study approach, I aim to learn more about what works in a learning community and why.

This study is significant because there is a need to understand how networks bring about change and improvement in school environments as they evolve to meet the new skills and knowledge required of students in their future workplaces. This research may produce new definitions or categories of blended models of elearning. This research may guide those setting up future elearning communities or those implementing learning management systems in educational settings. In particular, the Department's pending state-wide learning management system, makes this research timely and significant.

It is my intention to interview the 13 or so staff who were employed as part of the elearning community Project and two staff from each school. I propose to email the Project Coordinator. The email I would like to send is attached. This email asks the coordinator to forward an invitation to participate to elearning community staff. I will also request the elearning community staff to forward the information to two teaching staff who can contact me if they are interested in participating.

The staff, coaches and teachers who volunteer to participate will be interviewed at their place of employment or as convenient to them. Interviews may be done by telephone or computer-assisted telephone.

Please find attached all proposed email correspondence, the explanatory statement that would be used to explain the research to participants and the questions that would be used.

Kind regards,

Pennie White
PhD Student

Appendix B. Principal Permission Form

Project Title: Networks Facilitating Change: A Case Study of an eLearning Community

- I have received the principal permission request letter and addition documents (proposed email correspondence and project explanatory statements).
- I acknowledge that the Monash University ethics committee have approved the research with the project number CF09/0980: 2009000476.
- I acknowledge that this research has been approved by DEECD on 29 July 2009.
- I give my permission for this research to be conducted.

Name:

School:

Signature:

Date:

Appendix C. Email to Project Coordinator

Dear Project Coordinator,

I am a PhD researcher with Monash University. I would like to conduct a qualitative case study on the elearning community Leading Schools Fund project. The purpose of this research is to explore how networks of people facilitate change.

My request is that past and present elearning community educators from the seven schools are sent an invitation to participate in an interview of 20 minutes. They will have the option to contact me if interested.

This proposal has been approved by DEECD and all of the school principals.

I will forward an email that may be sent to participants. Thank you.

Kind regards,

Pennie White
PhD Researcher
Monash University
Mobile: [omitted]

Appendix D. Email for Project Coordinator to Send to eLearning

Community Educators

To eLearning Community Educators,

I am a PhD researcher with Monash University. I would like to conduct a qualitative case study on the elearning community Leading Schools Fund project. The purpose of this research is to explore how networks of people facilitate change.

I would like to invite you, as a past or present elearning community educator, to participate in an interview of 20 minutes. Please contact me if you are interested.

This proposal has been approved by DEECD and all of the school principals.

I look forward to hearing from you.

Kind regards,

Pennie White
PhD Researcher
Monash University
Mobile: [omitted]
Email: [omitted]



Appendix E. Explanatory Statement for Teachers and Coaches

Project Title: Networks Facilitating Change: A Case Study of an eLearning Community

My name is Ms Pennie White and I am doing research under the supervision of Dr Bernard Holkner, a Senior Lecturer in the Department of Education, towards a PhD at Monash University.

I am looking for up to 30 coaches/teachers willing to participate in an interview of 20 minutes that will be audio-taped. To be eligible to participate persons must be 18 years of age and be (or have been) staff members of any of the elearning project schools. I have been able to contact you as you provided your contact details when you expressed interest in participating in this research.

The aim of the research is to explore how networks of teachers influence professional learning and change. I hope this research will benefit our schools when planning professional learning for teachers. Another aim of the research is to add to the body of knowledge on how change is facilitated by networks of people.

Should you like me to acknowledge your help in my report, I can include your name and/or the name of your organisation; otherwise your participation will remain anonymous. However, if you prefer, you may remain anonymous and only the combined results of all participants will be published.

Please understand that while care will be taken to de-identify your responses, your participation in the study and identification in the final report might be possible in the light of the small and coherent nature of the organisation(s). Each participating organisation will be provided with a copy of the final report. The research will also be presented at conferences and in journal articles.

You do not have to participate in the interview. If you do participate, you do not have to answer every question. If you have any questions, you can ring me on [omitted] or email me at [omitted]. If you need to make an STD or international call, you can give me your phone number and ask me to call you back.

Only the researchers will have access to the original data. Data will be retained in the Department for at least five years. If the data are to be retained other than within a department or academic

unit, a record of its location will be filed with the head of the unit and a copy with the secretary. The Victorian privacy laws that require the University to “take reasonable steps to destroy or permanently de-identify personal information if it is no longer needed for any purpose” (IPP 4.2, Information Privacy Act 2000 (Vic.) will be adhered to.

You can complain about the study if you do not like something about it. To complain about the study, you need to phone 9905 2052. You can then ask to speak to the secretary of the Human Ethics Committee and tell him or her that the number of the project is CF09/0980: 2009000476. You could also write to the secretary. That person’s address is:

The Secretary, Standing Committee on Ethics in Research Involving Humans

PO Box 3A Monash University

Victoria 3800

Telephone (03) 9905 2052 fax (03) 9905 1420 email: SCERH@adm.monash.edu.au

Thank you,

Ms Pennie White

PhD Researcher,

Monash University



Appendix F. Informed Consent Form for Teachers and Coaches

Project Title: Networks Facilitating Change: A Case Study of an eLearning Community

I agree to take part in the above Monash University research project. I have had the project explained to me and I have read the Explanatory Statement, which I keep for my records. I understand that agreeing to take part means that I am willing to:

Be interviewed by the researcher and allow the interview to be audio-taped. I understand that participation in the interview is voluntary and that I may withdraw anytime from participating at any time before the conclusion of the interview.

I understand that my responses will be de-identified in the final report, but understand that my participation in the study and identification in the final report might be possible in the light of the small and coherent nature of the organisation(s), or

I wish to be acknowledged by name in the final report. I understand this may increase the chances of my interview responses being identifiable. My name will not appear with my comments but in a list of contributors, and

I am happy for the data to be used in future research, and

I am happy for audio/video to be used in presentations/publications

Signature.....

Date:.....

Appendix G. Semi-Structured Interview Questions

Educator Profile—Tell me about yourself and your role:

Gender: [Male][Female]

School: [River College][Red Gum College][Eucalyptus College][Eucalyptus College] [Manna Gum College][Ferny College][Banksia College][Wattle College] Comments: (About changes in location)

Specify job/position at your school or within the elearning community project and movements in these as relevant.

Years teaching experience or other past employment background?

[1–2][3–7][8–11][12–15][16–20][more than 20] i.e. worked in industry or always in education sector.

What do you teach? (You can select more than one)

[English][Maths][Science][Humanities][Art/Technology][H&PE][Non-classroom][other]

I'd like to ask about a number of aspects of the elearning community project and would like your stories or comments on these topics:

1. **Collaboration with others**—Do you feel that by being in the elearning community you have the chance to communicate with people you normally wouldn't communicate with?
2. **Working with colleagues**—Do you collaborate with other teachers? In what ways? How have you helped other teachers? How have other teachers helped you?
3. **School-based coaches and network-based coaches**—Have you worked with your school-coach or network-based coaches? Tell me about that.
4. **Learning management system (LMS)**—Did the fact that you were leaving a permanent written record of what you were saying ever influence what you wrote on the LMS? How so? How would you change the LMS to make it better?
5. **Technical aspects**—Did you have any technical problems using the ICT in your teaching and collaborating?

6. **Laptop program**
7. **Professional development**
8. Has the **curriculum** becomes increasingly integrated with Information and Communication Technology (ICT)?
9. Have you **changed the way you teach or coach**? If yes, what made the most impact?
10. In what ways have you benefited out of being in the elearning community school?
11. How do you think this whole experience could this have been more **effective or more rewarding for you**?
12. If you were talking to another teacher who had no experience with this kind of project and they said, "What is your school involved in?" **How would you sum it all up** for them?
13. Is there **anything else** that you want to tell me that might help me understand this better?
14. Is there **anything else** you wish to add or explain?
15. Are there any **artifacts** you are able to give me that would be useful to this research? A sample of curriculum developed, [ApprendWeb] screen shots or data for example?

I will read through this list of **topics again** and give you the chance to anything you may not have said before.

Appendix H. Emergent Themes in Relation to Communities of Practice

Theory Concepts

| Broad themes | Supporting Quotes from the data | Communities of practice links | Links to other literature |
|--|--|---|--|
| Support from leadership is necessary for the success of ICT integration initiatives | <p>“Our principal has really been a great advocate of progressing in eLearning, and that’s certainly helped my job as coach...” Coach</p> <p>“It varied over the project how smoothly it ran, and that really depended on school leadership, ICT leadership, and who were our technicians in the school.” Coach</p> | <p>Leaders enable the brokering by supporting coaching programs, elearning and providing adequate technical support.</p> <p>Finding - contributing to CoP – factors enabling brokering by - can be applied to the steward who might be an ICT leader.</p> | Hartnell-Young, 2006, p. 461 |
| Teachers learned about the practices of the new community of practice by working with the coaches | <p>“I have a greater awareness of jargon and what’s out there.” Coach</p> | <p>This is an example of legitimate peripheral participation and demonstrates a ‘new-comer’ learning the jargon of the community of practice.</p> | Henderson, 2008, p. 2 |
| Teachers can add to their repertoires by working with coaches who have learned from other communities of practice. | <p>“It is a good way too of working with people who are travelling around to different schools and bringing schools closer together in some ways, and learning from each other too.” Teacher</p> <p>“It was a very powerful experience to collaborate with everybody... We were being exposed to new things and new ways of doing things. So ... and people helped each other... we gave PD to each other... went to each other’s schools. It was highly collaborative and highly supportive.” Coach</p> | <p>The coaches are like brokers between the communities of practices because they met regularly and share repertoires between the different schools’ communities of practice.</p> | <p>“Brokers are those people-teachers, principals, researcher, and students-able to make connections across communities of practice and open new possibilities for meaning.” Hartnell-Young, 2006, p 465</p> |

| Broad themes | Supporting Quotes from the data | Communities of practice links | Links to other literature |
|---|--|--|---------------------------------------|
| An ongoing program of how to teach with technology is better than teaching one off skills | “Either the network-based coach who had run the session would come to the school and work with them, or the learning coach in their own school would sit down and actually work with them as they thought through how it actually was going to look and work in their own classroom. And I think that that was really important.” Coach | Shared repertoires are expanded by the brokers support. | Samarawickrema & Stacey, 2007, p. 313 |
| Relationships are crucial to the operations of communities of practice | <p>“And it was really interesting over time to watch how... those relationships between people developed... I developed really strong relationships with the coaches and network-based coaches, and the unique set of skills that came out of that was just phenomenal, it just grew year after year.” Project coordinator</p> <p>“I was lucky in that I was at a school that I knew the staff really well and they knew me and trusted me so that when I went in I didn’t have to establish relationships, I really had relationships with most of the staff so I think that makes a big difference, to have someone they can trust and they knew they could trust me and I’m very patient and try not to be judgmental.” Coach</p> | Mutual engagement is one aspect of communities of practice that describes doing things together. | Henderson, 2008, p. 1 |

Appendix I. Auto Codes Generated for Interviews

| Auto Codes | | | | | | | |
|---|---------|----------|-----------------|---------|------------------|----------|--|
| Name | Sources | Referenc | Created On | Created | Modified On | Modified | |
| 0.Profile | 25 | 25 | 13/08/2015 6:54 | PW | 13/08/2015 6:54 | PW | |
| 01.Collaboration with others | 27 | 27 | 13/08/2015 6:54 | PW | 13/08/2015 7:05 | PW | |
| 02.Working with colleagues | 26 | 27 | 13/08/2015 6:54 | PW | 13/08/2015 7:07 | PW | |
| 03.Learning Coaches and Development Managers | 28 | 28 | 13/08/2015 6:54 | PW | 13/08/2015 7:07 | PW | |
| 04.Learning Management System | 27 | 27 | 13/08/2015 6:54 | PW | 13/08/2015 7:03 | PW | |
| 05.Technical Aspects | 26 | 26 | 13/08/2015 6:54 | PW | 1/10/2015 5:11 A | PW | |
| 06.Laptop Program | 27 | 28 | 13/08/2015 6:54 | PW | 13/08/2015 7:05 | PW | |
| 07.Professional Development | 28 | 28 | 13/08/2015 6:54 | PW | 1/10/2015 5:17 A | PW | |
| 08.Curriculum increasingly integrated with ICT~ | 27 | 28 | 13/08/2015 6:54 | PW | 13/08/2015 7:03 | PW | |
| 09.Changed the way you teach or coach~ What made the mo | 28 | 28 | 13/08/2015 6:54 | PW | 1/10/2015 5:17 A | PW | |
| 10.In what ways have you benefited~ | 27 | 27 | 13/08/2015 6:54 | PW | 1/10/2015 5:17 A | PW | |
| 11.How could it be more effective or more rewarding for you | 26 | 26 | 13/08/2015 6:54 | PW | 1/10/2015 5:17 A | PW | |
| 12.How would you sum it all up~ | 28 | 28 | 13/08/2015 6:54 | PW | 1/10/2015 5:17 A | PW | |
| 13.Anything else~ | 21 | 21 | 13/08/2015 6:54 | PW | 1/10/2015 5:17 A | PW | |
| 14.Artifacts~ | 20 | 20 | 13/08/2015 6:54 | PW | 13/08/2015 7:07 | PW | |
| 15.List of topics | 11 | 11 | 13/08/2015 6:54 | PW | 13/08/2015 7:07 | PW | |

Appendix J. Six Main Themes and Sub Themes

1. Communities of practice perspective on the way schools worked together
 - 1.1. Mutual engagement across seven schools in the joint enterprise of implementing technology in the curriculum
 - 1.2. Collaboration across the schools between people at different levels
 - 1.3. Having other schools doing the same thing at the same time was good
 - 1.4. Collaboration within and beyond the school
 - 1.5. The project was an equaliser, reduced competition and provided cost savings
 - 1.6. Laptop program - schools implemented in their own ways some didn't do the 1:2 model - pluses and minuses to both approaches
 - 1.7. Collaborative water project
 - 1.8. Geocaching and online webinars projects
 - 1.9. Community cohesion contributed to sustainability as people still collaborated after the project finished or when they moved schools
 - 1.10. Interesting things about the research process – is that what I am supposed to say?
2. When collaboration did not happen or how it could have been better
 - 2.1. There was not as much collaboration as we might have liked
 - 2.2. Working in a cluster of schools can take longer for decision making
 - 2.3. It is challenging to work together with seven Principals
 - 2.4. It is difficult to make time to collaborate with other schools
 - 2.5. Problems of not continuing the funding
 - 2.6. Curriculum changed to different degrees but not across the board evenly
 - 2.7. Were some schools just in it for the money?
 - 2.8. Learning Management System
 - 2.9. Virtual Learning Environment Didn't Happen
 - 2.10. Which project are we on about?
3. Having coaches available at the school and in class is beneficial
 - 3.1. The role of the coach
 - 3.2. Having coaches was good

- 3.3. Professional learning
- 3.4. Professional Learning but luke-warm on collaboration
- 3.5. The outcomes of coaching
- 3.6. Informal PD
- 3.7. 'Just in time PD' tailored to teacher need
- 3.8. The change process
- 3.9. Chainmail Professional Learning from coach then sharing with other teachers
- 3.10. Coaches were able to come into class
- 3.11. The most important thing in coaching is building the relationship
- 3.12. Coaches were good at liaising about technical problems
- 3.13. In some schools coaching continued after the official funding
- 3.14. Classroom impact of coaching
4. Problems with the coaching model
 - 4.1. The coaching role could have been better defined
 - 4.2. Sometimes things didn't work so well
 - 4.3. Teachers are too busy
 - 4.4. Not all coaches are good
 - 4.5. On-call IT technical support would have been good
 - 4.6. The downside to coaching - I miss the classroom
 - 4.7. The coaches were for a limited time – continued coaching is needed
5. Coaches need other coaches
 - 5.1. Coaches meetings – an opportunity for brokering
 - 5.2. Avoiding the Hazards of brokering
 - 5.3. Brokering
 - 5.4. Some coaches sought other coaches beyond the community
6. Coaches did not work much with other coaches

Appendix K. Mid-Stage Formulations of Findings

| | | |
|---|--|---|
| Networks facilitating change: A case study of an elearning community | | |
| The elearning community supported the professional learning of teachers in integrating technology into the curriculum | | |
| Q1 How can teacher professional learning in integrating technology into the curriculum in the context of a network of schools be understood? | Q2 How do teachers and coaches experience working as peers to integrate technology into their curriculum? | Q3 How can coaches be supported in their role to assist teachers to integrate technology into their curriculum? |
| Finding 1: Schools forming a network together benefits teacher professional learning (how) | Finding 2: Coaches enabled teachers to integrate technology into their curriculum (by...) | Finding 3: Coaches can do their job better when they are supported (how supported) |
| Preparing the stage – community, setting the agenda, hire the crew, infrastructure, technologies | The performance – professional learning coaches enabling teachers in classrooms | Behind the scenes - backstage considerations – supporting the crew |
| <ol style="list-style-type: none"> 1. There were benefits in forming a community and having a common purpose 2. A community of schools allows collaboration within and beyond the schools 3. Being a community allows the sharing of resources, knowledge and best practice - Laptops, LMS, Collaborative Projects Technical Problems 4. The project make fixing and developing technology and infrastructure a priority which was important for being able to use technology in the classroom 5. Community reduces competition and there are cost savings 6. Ongoing community is needed | <ol style="list-style-type: none"> 1. Teachers and coaches benefit from engaging in a combination of professional learning approaches <ol style="list-style-type: none"> 1. workshops 2. one-on-one 3. in classroom support 4. just-in-time support 2. Teachers and coaches need time to engage in professional learning 3. Coaches could help with sorting out quasi technical - problems “especially when it rained” 4. Professional learning and coaches gives teachers more confidence to implement technology 5. Continued access to coaching is needed | <ol style="list-style-type: none"> 1. Coaches are supported when they have good leadership 2. Coaches are supported when they have a cross school team 3. Coaches are supported when they are in an internal school team 4. Coaches find it beneficial to link with peers and experts beyond their immediate community 5. There are ways coaches could have been better supported – Support in clarifying the role and access to professional learning including on coaching – not having to be quasi –technicians |

Appendix L. Data Presentation and Discussion Development

Finding 1. Communities of practice formation was the foundation for technology integration

- 1.1. A community of practice formed across seven schools (Evidenced by mutual engagement, joint enterprise and shared repertoire)
- 1.2. Communities of practice were formed at different levels within and across schools (Principals, ICT Leaders, Technicians, Coaches, Teachers)
- 1.3. Technology integration practices were reified through negotiation at the local level (Top-down bottom-up, laptops, learning management system, infrastructure, curriculum, coaching approaches)
- 1.4. A multiple school community of practice is sustainable when supported by a funded project but not beyond the funding period (Technology integration had limited sustainability after the funding period – technology needed renewing / the support wasn't there for ongoing professional learning)

Finding 2. Multi-tiered professional learning programs for teachers in integrating technology

- 2.1. Teachers have access to optional professional learning workshops: optional workshops as an effective method of professional learning (optional workshops were offered to support the integration of new technologies / the best bit was being able to follow up with coaches individually)
- 2.2. Teachers have access to coaches to support their professional learning in integrating technology: coaching as an effective method of professional learning (informal support, just-in-time support, curriculum development support, local workshops particular to a schools' needs – coaches have to be perceived as legitimate and form good relationships)
- 2.3. Teachers can learn from other teachers through professional learning conversations and sharing resources: collegiality as an effective method of professional learning (teachers benefited from conversations at workshops and within school communities of practice)
- 2.4. Collaborative projects were supported as an effective method of professional learning (water project, geocaching project – real world learning, connecting with experts, student led)
- 2.5. Teacher have access to a multi-tiered professional learning program in integrating technology in a communities of practice context (the effect of the combined programs were greater than the sum of the whole)

Finding 3. Supported coaches leverage the learning for teachers in integrating technology

- 3.1. Coaching is set in the context of a multiple school community of practice (individual goals are set in a broader context with same aims)
- 3.2. Coaches formed their own community of practice (benefitted from knowing what other schools were doing and was a form of professional learning for coaches)
- 3.3. Coaches were supported by school leadership
- 3.4. Coaches belonged to local communities of practice
- 3.5. Coaches brokered practices across boundaries
- 3.6. Coaches sought experts outside of the community of practice

3.7. Coaches were supported in their own professional learning

Development of Findings

1. Professional learning of teachers is most effective when set in a multiple school community of practice
2. A multi-level professional learning approach for teachers is most effective when set in a multiple school community of practice
3. A multi-level professional learning approach should be a combination of structured hands on workshops, flexible coaching and should support collegiality.

Development of Implications

1. Funding is needed to sustain a multiple school community of practice to support technology integration
2. Funding is needed to support coaching programs to support technology integration
3. Coaches need leadership support, professional learning and to belong to a community of practice.
4. Up-to-date technology infrastructure and technical support are a prerequisite for successful technology integration by teachers

Appendix M. Final Stage Coding Nodes

20160329 PhD Nvivo.mvp - NVivo Pro

FILE HOME CREATE DATA ANALYZE QUERY EXPLORE LAYOUT VIEW

Workspace Item Edit Paste Copy Merge Clipboard Format Paragraph Styles Editing Proofing

Nodes < Chapter Coding

| Name | Sources | References | Created On | Created By | Modified On | Modified By |
|---|---------|------------|-------------------|------------|-------------------|-------------|
| 5 Schools forming a network together benefits teacher professional lear | | 0 | 4/06/2014 6:29 | PW | 4/02/2015 4:48 AM | PW |
| 5.1 A community of practice formed across seven schools | | 19 | 4/06/2014 5:54 | PW | 2/04/2016 7:52 PM | PLW |
| 5.2 Communities of practice formed at different levels | | 9 | 13/12/2014 5:3 | PW | 2/04/2016 7:52 PM | PLW |
| 5.3 Forming a community of practice was equalising | | 5 | 14/19/06/2014 7:3 | PW | 30/03/2016 6:33 A | PLW |
| 5.4 A multiple school community of practice is not sustainable with | | 13 | 23/11/07/2014 8:1 | PW | 30/03/2016 6:33 A | PLW |
| 6 Technology Implementation Practices | | 0 | 14/04/2015 10: | PW | 30/03/2016 6:34 A | PLW |
| 6.01 Laptop program - schools implemented in their own ways - plu | | 21 | 31/13/07/2014 6:5 | PW | 2/04/2016 7:52 PM | PLW |
| 6.02 Learning Management System | | 27 | 40/22/01/2015 10: | PW | 2/04/2016 7:52 PM | PLW |
| 6.02.02 Accountability to the enterprise was strong but the practic | | 1 | 3/30/03/2016 7:0 | PLW | 31/03/2016 2:21 P | PLW |
| 6.02.05 The data is not right and there are "too many clicks" | | 0 | 0/30/03/2016 11: | PLW | 30/03/2016 11:01 | PLW |
| 7 Professional Learning | | 7 | 10/19/07/2014 8:3 | PW | 30/03/2016 6:35 A | PLW |
| 6.03 Formal professional learning combined with one-to-one curricular | | 9 | 22/14/12/2014 12: | PW | 2/04/2016 7:15 PM | PLW |
| 6.04 Teachers learn from other teachers at PD or after working with c | | 7 | 12/14/08/2014 4:5 | PW | 4/02/2015 9:07 AM | PW |
| 6.05 Coaches give teachers more confidence to implement technolo | | 9 | 11/26/01/2015 2:3 | PW | 2/04/2016 7:52 PM | PLW |
| 6.06 Teachers and coaches need time to work together - "teachers w | | 10 | 14/26/01/2015 10: | PW | 2/04/2016 7:15 PM | PLW |
| 6.07 Coaches need to be able to establish a good relationship with t | | 5 | 10/14/08/2014 9:0 | PW | 13/08/2015 7:00 P | PW |
| 6.08 Teachers were enabled to change classroom practice | | 10 | 12/31/01/2015 3:5 | PW | 13/08/2015 7:00 P | PW |
| 6.09 Teachers value support in the classroom | | 3 | 4/31/01/2015 5:0 | PW | 4/02/2015 9:07 AM | PW |
| 6.10 Teachers find coaches helpful and supportive why trying to inte | | 11 | 24/19/07/2014 8:4 | PW | 13/08/2015 6:55 P | PW |
| 6.11 Teachers work with coaches and then share with other teachers | | 2 | 2/4/02/2015 5:41 | PW | 4/02/2015 9:08 AM | PW |
| 6.14 Changed the way I teach | | 15 | 18/23/01/2015 11: | PW | 2/04/2016 7:52 PM | PLW |

PLW 43 Items

20160329 PhD Nvivo.mvp - NVivo Pro

FILE HOME CREATE DATA ANALYZE QUERY EXPLORE LAYOUT VIEW

Workspace Item Edit Paste Copy Merge Clipboard Format Paragraph Styles Editing Proofing

Nodes < Chapter Coding

| Name | Sources | References | Created On | Created By | Modified On | Modified By |
|---|---------|------------|----------------------|------------|-------------------|-------------|
| 6.15 Curriculum changed to different degrees but not across | | 19 | 22/13/07/2014 7:03 A | PW | 2/04/2016 7:52 PM | PLW |
| 6.16 Teachers don't use technology if it is not intuitive and c | | 1 | 2/4/02/2015 6:23 AM | PW | 4/02/2015 9:07 AM | PW |
| 6.17 Teachers will not use technology for technology's sake | | 1 | 1/4/02/2015 6:57 AM | PW | 4/02/2015 9:07 AM | PW |
| 6.25 Keeping expectations that come with technology in che | | 1 | 2/14/02/2015 1:46 P | PW | 14/02/2015 1:46 P | PW |
| 6.26 Continued access to coaching in schools is needed | | 7 | 11/14/08/2014 9:07 P | PW | 13/08/2015 6:55 P | PW |
| 7.02.01 Workshops | | 1 | 1/14/02/2015 7:23 P | PW | 2/04/2016 7:15 PM | PLW |
| 7.03.01 The power of just-in-time professional learning | | 12 | 16/28/01/2015 6:46 P | PW | 2/04/2016 7:52 PM | PLW |
| 7.05 Collaborative projects were an effective form of profess | | 3 | 9/25/01/2015 7:25 A | PW | 30/03/2016 6:36 A | PLW |
| 7.4.2 Teachers learn from informal professional learning con | | 2 | 2/31/01/2015 6:42 P | PW | 30/03/2016 6:38 A | PLW |
| just-in-time | | 9 | 10/30/09/2015 10:24 | PW | 12/02/2016 6:06 A | PLW |
| 8 Augmenting the Coaching Initiative | | 0 | 0/22/07/2014 5:02 A | PW | 1/04/2016 8:51 AM | PLW |
| 8.01 Coaches formed their own community of practice | | 10 | 18/22/07/2014 5:04 A | PW | 2/04/2016 7:52 PM | PLW |
| 8.02 Coaches belonged to local communities of practice | | 8 | 18/22/07/2014 5:03 A | PW | 2/04/2016 7:15 PM | PLW |
| 7.5 Coaching was a collaborative relationship which the c | | 3 | 3/29/01/2015 3:59 P | PW | 2/04/2016 7:15 PM | PLW |
| 8.02 Coaches connected with the broader landscape of pract | | 0 | 0/1/04/2016 6:58 AM | PLW | 1/04/2016 6:58 AM | PLW |
| 8.04 Coaches are supported when they have encouraging an | | 5 | 5/25/01/2015 9:43 P | PW | 1/04/2016 6:57 AM | PLW |
| 7.6 There are ways coaches could have been better supp | | 5 | 7/25/01/2015 8:32 P | PW | 2/04/2016 7:52 PM | PLW |
| 8.03.01 Some coaches would have liked formal training i | | 1 | 2/30/03/2016 6:46 A | PLW | 30/03/2016 6:47 A | PLW |
| 8.03.02 Coaches are better supported if they don't have t | | 4 | 5/31/01/2015 8:39 A | PW | 30/03/2016 6:44 A | PLW |
| 8.05 Coaching Advanced by Legitimacy | | 3 | 3/4/02/2015 8:55 AM | PW | 2/04/2016 7:41 PM | PLW |

PLW 43 Items

Appendix N. Interviews with Number of Nodes and References

The screenshot shows the NVivo Pro software interface. The main window displays a table titled "Edited and Coded Interviews". The table lists 25 interviews with their respective node counts and reference counts. The interface includes a menu bar (FILE, HOME, CREATE, DATA, ANALYZE, QUERY, EXPLORE, LAYOUT, VIEW) and a toolbar with various editing and formatting options.

| Name | Nodes | Reference | Created On | Created By | Modified On | Modified By |
|---------|-------|-----------|---------------------|------------|---------------------|-------------|
| Andrea | 22 | 34 | 26/01/2015 12:55 PM | PW | 13/08/2015 4:42 PM | PW |
| Annette | 24 | 32 | 26/01/2015 12:44 PM | PW | 31/03/2016 7:31 AM | PLW |
| Ben | 26 | 41 | 26/01/2015 12:44 PM | PW | 30/03/2016 12:14 PM | PLW |
| Carmel | 34 | 50 | 26/01/2015 12:44 PM | PW | 13/08/2015 7:09 PM | PW |
| Carolyn | 22 | 34 | 26/01/2015 12:44 PM | PW | 31/01/2015 3:59 PM | PW |
| Celeste | 32 | 49 | 26/01/2015 12:44 PM | PW | 13/08/2015 7:00 PM | PW |
| Clara | 24 | 34 | 26/01/2015 12:44 PM | PW | 13/08/2015 7:00 PM | PW |
| Diane | 34 | 45 | 26/01/2015 12:44 PM | PW | 4/02/2015 7:07 AM | PW |
| Emma | 28 | 36 | 26/01/2015 12:44 PM | PW | 29/01/2015 5:12 AM | PW |
| Glenn | 23 | 29 | 26/01/2015 12:44 PM | PW | 31/01/2015 4:53 PM | PW |
| Gwen | 27 | 38 | 26/01/2015 12:44 PM | PW | 28/01/2015 7:07 AM | PW |
| Hilary | 24 | 37 | 26/01/2015 12:44 PM | PW | 31/03/2016 7:31 AM | PLW |
| Jayne | 27 | 48 | 26/01/2015 12:44 PM | PW | 29/01/2015 5:39 AM | PW |
| Jenny | 30 | 42 | 26/01/2015 12:44 PM | PW | 26/01/2015 1:01 PM | PW |
| Jim | 27 | 57 | 26/01/2015 12:44 PM | PW | 1/02/2015 12:31 AM | PW |
| Julie | 30 | 39 | 26/01/2015 12:44 PM | PW | 31/01/2015 11:09 AM | PW |
| Lewis | 25 | 32 | 26/01/2015 12:44 PM | PW | 29/01/2015 7:43 PM | PW |
| Louise | 26 | 35 | 26/01/2015 12:44 PM | PW | 2/04/2016 7:52 PM | PLW |
| Lucy | 29 | 41 | 26/01/2015 12:44 PM | PW | 1/02/2015 12:25 AM | PW |
| Maria | 24 | 29 | 26/01/2015 12:44 PM | PW | 31/01/2015 4:54 PM | PW |
| Mary | 24 | 36 | 26/01/2015 12:44 PM | PW | 13/08/2015 7:09 PM | PW |
| Micheal | 29 | 43 | 26/01/2015 12:44 PM | PW | 28/01/2015 10:59 AM | PW |
| Peter | 25 | 34 | 26/01/2015 12:44 PM | PW | 28/01/2015 10:59 AM | PW |
| Robert | 23 | 34 | 26/01/2015 12:44 PM | PW | 4/02/2015 9:42 AM | PW |
| Sylvia | 26 | 33 | 26/01/2015 12:44 PM | PW | 28/01/2015 10:50 AM | PW |
| Tanya | 31 | 45 | 26/01/2015 12:44 PM | PW | 2/04/2016 7:15 PM | PLW |
| William | 27 | 35 | 26/01/2015 12:44 PM | PW | 28/01/2015 10:46 AM | PW |
| Yvonne | 25 | 40 | 26/01/2015 12:44 PM | PW | 13/08/2015 7:01 PM | PW |

Appendix O. Example of Coding Stripes

The screenshot displays a software interface with a document on the left and a sidebar on the right. The document content is as follows:

Carmel, Teacher, Banksia College

0.Profile

female teacher at Banksia College

A This year I've been Year 8 Manager, and been involved with teaching science, junior science, Year 11 biology, and year nine integrated studies.

Q And how long have you been teaching?

A This is my 11th year at the high school, so probably looking at about 15 years.

Q And have you had any other different job background before that?

A Bits and pieces, hospitality, yeah that's probably about it really.

1.Collaboration with others

A **Oh Definitely.**

A Particularly early on when I attended some of the whole ... you know PDs where everybody got together and there were different work groups, I found them really useful. There was involvement when it first started off, and I think that was really highly successful, but I seem to have had less to do with it in the last year.

2.Working with colleagues

A Just through the sharing of ideas and seeing what other teachers have been doing in their classrooms, and as best one can. I mean, you know what it's like in these busy places, unless you've got the actual time to sit down and share things sometimes it kind of happens on the hop, when somebody is there and "Help, help," those situations. More informally than formally.

3.Learning Coaches and Development Managers

A Yeah, I think it was a godsend to have the learning coaches arrive, and I worked very closely with Ron when he first was appointed, and that was just great.

4.Learning Management System

A AppendWeb, kind of it worked to a certain extent, but I don't think we ever got it to the point where it worked really well. I did persevere and it did take a bit of time, I'd try and use it but I did encounter difficulties, and I really stepped away from it this year.

A Yes. I'm trying to think of specific examples. Just having the right class lists helped a lot, and what else? <scratches her head>

5.Technical Aspects

A Mainly from in school. When things were working everything was fine, but if students

The sidebar on the right contains a list of nodes with their respective coding stripes:

- 6.26 Continued access to coaching in schools is needed
- 6.15 Curriculum changed to different degrees but not across the board evenly
- 6.14 Changed the way I teach
- 6.08 Teachers were enabled to change classroom practice
- 6.05 Coaches give teachers more confidence to implement technology in the classroom
- 6.03 Formal professional learning combined with one-to-one curricula development support, and in class support meant success for teacher in integrating technology in the curriculum
- 6.01 Laptop program - schools implemented in their own ways - pluses and minuses to both approaches some didn't do the 1 to 2 model
- 5.1 A community of practice formed across seven schools
- 5.2 Communities of practice formed at different levels
- 5.4 A multiple school community of practice is not sustainable without funding
- 6.06 Teachers and coaches need time to work together. "Teachers were too busy teaching"
- 6.10 Teachers find coaches helpful and supportive why trying to integrate
- 6.02 Learning Management System
- 7.03.01 The power of just-in-time professional learning

The interface includes a menu bar (FILE, HOME, CREATE, DATA, ANALYZE, QUERY, EXPLORE, LAYOUT, VIEW), a toolbar with various icons, and a status bar at the bottom showing "Nodes: 34 References: 50 Editable Line: 36 Column: 0" and a zoom level of "100%".

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