

A story of early years educators' experiences of technology and literacy in early years learning environments.

Submitted by

Karen J. McLean

Diploma of Teaching (Primary)

Bachelor of Education (Primary),

Master of Education

A thesis submitted in fulfilment of the requirements of the degree of Doctor of Philosophy

School of Education

Faculty of Education

Australian Catholic University

2012

STATEMENT OF AUTHORSHIP AND SOURCES

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

No parts of this thesis have been submitted towards the award of any other degree or diploma in any other tertiary institution.

No other person's work has been used without due acknowledgement in the main text of the thesis.

All research procedures reported in the thesis received the approval of the relevant Ethics/Safety Committee (where required).

Karen J. McLean

15th February, 2012.

A story of early years educators' experiences of technology and literacy in early years learning environments.

ABSTRACT

This study sought to explore the relationship between literacy and technology in the early years of education. The purpose of the study was to gain insight into the nexus between literacy centred practice and technology in the practice of early years educators. The study was framed by the question, *“What are early years educators’ experiences of the relationship between technology and literacy in early years learning environments?”* In particular the study focused on the knowledge, understanding and pedagogical practice of educators and those involved in shaping the learning experiences of children in early learning environments.

Informed by relevant literature, the researcher established a theoretical framework for the study by positioning it within contemporary understandings of pedagogical approaches to technology and literacy. The study embraced both a pre-school (Kindergarten) early learning environment and that of the first year of primary education (Preparatory). The focus research question raised issues relating to teacher mediation of technology in the literacy learning environment. Insights were sought initially through an investigation of the beliefs, understandings and assumptions about technology and literacy which early years educators bring with them to the learning environment. Secondly the study explored their understandings of the relationship between technology and literacy through an action-reflection model which focused on their practices and applications of technology to literacy learning in the early learning environment.

The study adopted a narrative methodology. Using an action-reflection cycle research design, the researcher was a participant observer in the learning spaces, walking beside the educators and observing and interviewing regularly over an extended period of time. The relationship between inquirer and participants was integral to capturing the rich complexity of the human experience. Case study captured the happenings within the changing life space of the learning environments. During the six month time frame of data collection the lived experiences of participants were documented using a range of qualitative methods including interviews, learning story journals, work samples, photographs and a researcher journal.

The exploration aimed at providing rich information about these educators as mediators of technology in literacy programs. Educator beliefs, understandings and assumptions about technology and literacy practices were identified in the literature influencing pedagogical practice. It was therefore important to determine the views of early years educator’s in relation to these areas, and to consider how these understandings impart the early years learning environment. A further important aspect for consideration was the different ways in which early years educators interweave technology into the

literacy program and, in turn, provide children with access to learning with, about and through technology.

The study findings indicated that whilst the early years educators worked in different learning environments, they commenced the study with similar levels of competence. Both used technology in prescriptive ways. Whilst each had a different view of literacy, they both concluded the data collection period with similar views of technology and literacy, and were using technology in holistic ways. These findings suggest that the action-reflection model may have contributed to growth in understanding of the relationship between technology and literacy and to the change in use of technology. The pedagogy of each educator was similar. They began by finding out as much as they could about the children's interests and needs and sought to arouse children's interest and curiosity. They then used this knowledge to immerse the children in information rich environments, providing access to flexible and customisable technology so the technology came to the learning rather than the learning to the technology.

The early years learning environment thus became a community of learners: where children and teachers were learning with technology together and supported each other's learning between, across and within. Expectations for using technology in the literacy context were infused in classroom practice so that the children's work with technology was reflected in their literacy development. Further, the findings suggest that in the early years learning environment it was important for the educators to provide time for children's exploration of one form of technology, in different ways, over an extended period of time, in order to foster deep literacy learning.

The study re-contextualised Cambourne's (1995) conditions of learning in relation to the findings and a number of enhancements were suggested. A key recommendation from the study is that early years educators consider this re-contextualised model of Cambourne's (1995) conditions of learning for the application of technology to the literacy context.

The study makes significant contributions to the academy's increasing learning about educators' understanding of the developing relationship between technology and literacy in early years learning. It also illustrates the strength of a narrative or story based qualitative research approach in contextualizing the dynamics of cultural and social influences of technology and literacy development and in providing insights into pedagogical approaches to technology and literacy in the early years.

Acknowledgements

This is the story of early years educators' experiences of technology and literacy in the early years learning environment. It is a story that could not be told without the support or participation of some that I would like to acknowledge.

I would like to give my sincere thanks to the educators whose stories are in this thesis. I am extremely grateful for the time and commitment they gave to this study and for the journey we shared together. I would also like to acknowledge and thank the children whose stories are interwoven into the fabric of this thesis.

Thank you to Associate Professor Sue McNamara for being an extraordinary supervisor and for having the patience of a saint! Your support and guidance has far exceeded my expectations and with the journey we have been on together I feel privileged to call you a friend.

Thank you also to my co-supervisor, Dr. Ann Gervasoni. Many a critical incident was resolved over a coffee meeting, and through your words of wisdom you helped to bring the thesis to its final form. I also extend my sincere gratitude to Associate Professor Gloria Stillman and Associate Professor Susan Edwards for their support and constructive feedback on my work.

To Dr. Mellita Jones thank you for your encouragement, friendship and for keeping my attention focussed on the thesis. Now, perhaps I'll learn Italian, return to oil painting and to bookclub!

Finally, and most importantly, a very large thank you to my family. I have been truly blessed! Thank you to my wonderful husband, Steve, for your support in countless ways. Thank you for your understanding, for your love, and for being there when I needed you. To my beautiful children, Luke and Hayley, thank you for making me smile every day! To Scruffy the dog, thank you for just being *scruffy*, and simply the best medicine for many long hours of writing. Thank you also, to my parents for the many phone calls, and Friday night visits - even when it was just to see if the family had been fed! I look forward to now using the road map to *your* house, to repay my gratitude for the support you have given me.

Without the interest and encouragement of these incredible people this story would not be told. Thank you.

TABLE OF CONTENTS

Acknowledgements	iv
TABLE OF CONTENTS	v
LIST OF TABLES.....	xi
LIST OF FIGURES.....	xii
CHAPTER 1:	1
THE STORY BEGINS.....	
1.1 Introduction	1
1.2: Context of the Research	2
1.2.1: The Changing Landscape	3
1.2.2: From Rhetoric to Curriculum.....	5
1.3: Purpose of the Study	7
1.4: The Aims of the Study	8
1.5: The Significance of the Research.....	8
1.6: Structure of the Thesis	9
CHAPTER 2:	11
SURVEYING THE LANDSCAPE	
2.1: Introduction.....	11
2.2: Derivations of Current Practice.....	12
2.2.1: Cognitive Development and Early Literacy.....	13
2.2.2 Three Literacy Discourses Influencing Early Years Educator Practices.....	14
2.2.3: Traditional and Progressive Approaches to Literacy Education	18
2.2.4: Pre-school Emergent Literacy Pedagogy	24
2.2.5: Technology Perspectives.....	26
2.3 Changing Perspectives – the Drive to Re-contextualise Literacy	27
2.3.1: The Need for Schools and Pre-schools to Apply Digital Technology to the Literacy Context	33
2.4 Technology and Literacy: Curriculum and Pedagogical Reform.....	36
2.4.1 The Need for New Ways of Teaching and Learning in the Early Years of Education	40

2.5: Best Practice in Literacy and Technology Teaching.....	43
2.6 Barriers to Curriculum and Pedagogical Reform	50
2.7 Pedagogical Considerations for Working with Early Years Educators: Teacher Professional Learning	54
2.7.1 Using Technology to Connect.....	58
2.8 Summary	61
2.10: The Present Study	64
2.11 Glossary of terms	65
CHAPTER 3.....	68
SCAFFOLDING THE EXPLORATION	
3.1 Introduction	68
3.2 Establishing a Theoretical Framework.....	68
3.2.1 Constructivism: A Theoretical Foundation for the Methodology	71
3.2.2 Narrative Approaches.....	72
3.3 Narrative Methodology	75
3.4 Case Study as a Tool for Gathering Stories	78
3.5 Study Design	80
3.5.1 Interviews	83
3.5.2 The Action-Reflection Model: Actioning the Learning Cycles and Learning Story Journals.	88
3.6 Data Analysis	93
3.6.1 Thematic Analysis of Participant Stories	94
3.7 Limitations of the Study	96
3.7.1 Subjectiveness and Confirmability.....	96
3.7.2 Credibility / Trustworthiness.....	97
3.7.3 Transferability, Reliability	98
3.7.4 Time	99
3.8 Ethical considerations	100
3.9 Summary	101

CHAPTER 4.....	102
SUSIE’S STORY	
4.1 Introduction	102
4.2 Susie’s Learning Environment	103
4.3 The Initial Interview	105
4.3.1 Susie’s Beliefs, Understandings and Assumptions about Technology and Literacy Practices	105
4.3.2 Literacy Beliefs and Assumptions.....	105
4.3.3 Technology Beliefs and Assumptions	107
4.3.4 Pedagogy	110
4.3.5 Technology in the Learning Environment.....	114
4.4 The Cycles.....	117
4.4.1 Cycle One: Exploring with the Digital Camera	117
4.4.2 Susie’s Reflections on the First Action-Reflection Cycle	132
4.4.3 Cycle Two: Technology in Everyday Play and Learning	136
4.5 Susie’s Final Reflections	156
4.6 Vignette: George, the Curious Explorer.....	159
4.7 Summary	162
CHAPTER 5.....	164
MOLLIE’S STORY	
5.1 Introduction	164
5.2 Mollie’s Learning Environment	164
5.3 The Initial Interview	167
5.3.1 Mollie’s Beliefs Understandings and Assumptions about Technology and Literacy Practices	167
5.3.2 Pedagogy	168
5.3.3 Literacy Beliefs and Assumptions.....	169
5.3.4 Technology Beliefs and Assumptions	171
5.4 The Cycles.....	175
5.4.1 Cycle One: Becoming a Sustainable School	175

5.4.2 Mollie's Reflections on the First Action-Reflection Cycle	187
5.4.3 An Interview with Pete.....	194
5.4.4 Cycle Two: Podcasting for Learning.....	198
5.5 Mollie's Final Reflections	228
5.6 Pete's Final Reflections.....	236
5.7 Vignette: Don, the Reluctant Writer.....	241
5.8 Vignette: John, Understanding the Child	242
5.9 Summary	244
CHAPTER 6:	246
DISCUSSION OF THE EDUCATORS' STORIES	246
6.1: Introduction.....	246
6.2 Early Years Educator Beliefs, Understandings and Assumptions about Technology and Literacy Practices	247
6.2.1: Susie's Beliefs, Understandings and Assumptions about Technology and Literacy Practices at the Beginning of the Study	248
6.2.2 Mollie's Beliefs, Understandings and Assumptions about Technology and Literacy Practices at the Beginning of the Study.....	251
6.2.3 Similarities and Differences between Beliefs, Understandings and Assumptions about Technology and Literacy Practices at the Beginning of the Study	254
6.2.4 Changes to Early Years Educator Beliefs, Understandings and Assumptions about Technology and Literacy Practices	257
6.3 How Individual Practices and Institution Organisational Practices Impeded or Embraced Innovation	261
6.4 Cambourne's (1995) Model Applied to Main Findings of the Study	265
6.4.1 Immersion.....	265
6.4.2 Expectations	267
6.4.3 Responsibility	268
6.4.4: Employment & Practise	269
6.4.5 Approximations.....	273
6.4.6: Response	274
6.4.7 Demonstration	275

6.4.8 Engagement.....	277
6.5 Re-contextualising Cambourne’s (1995) Conditions of Learning	279
6.6 Summary	290
CHAPTER 7.....	291
THE EVOLVING STORY	
7.1: Introduction.....	291
7.2: Brief Summary of the Study	291
7.3: Addressing the Research Questions	293
7.4: The Early Years Educators’ Experiences.....	298
7.4: Recommendations Arising from the Study	300
7.4.1: Recommendations for Educators	300
7.4.2: Recommendations for Further Research	301
7.5: Final Reflection.....	301
REFERENCES	303

APPENDICES

Appendix 1: Initial Interview Questions	318
Appendix 2: Ethics	320
Appendix 3: Teacher Learning Story Journal Template	336

LIST OF TABLES

TABLE 2.1	14
Cognitive Development Perspectives that Influence Early Literacy Discourse.....	
TABLE 2.2	25
Reflecting the Qualities of Play in Literacy Learning Experiences	
TABLE 3.1	69
Illustration of the Epistemological Integrity of the Study	
TABLE 3.2	76
Characteristics of Narrative Research: Two Perspectives.....	
TABLE 3.3	95
Thematic Analysis of the Present Study	
TABLE 4.1	106
Overview of Susie’s Beliefs and Assumptions about Technology and Literacy Pratices drawn from the Initial Interview	
TABLE 5.1	167
Overview of Mollie’s Beliefs and Assumptions about Technology and Literacy Practices drawn from the Initial Interview	
TABLE 6.1	250
Alignment between Susie’s Description of a Literacy Enriched Play Experience and the Literacy Learning Processes.....	

LIST OF FIGURES

FIGURE 2.1	22
Cambourne’s Conditions of Learning (Cambourne, 1995, p.187)	
FIGURE 2.2	36
The Digital Learner (Andrews, 2004, p. 62)	
FIGURE 2.3	44
3D Model of Literacy (Durrant & Green, 2000)	
FIGURE 2.4	46
The Four Resources Model (Freebody, 2004, p. 1)	
FIGURE 2.5	47
The Multiliteracies Map (Hill, 2010, p. 323)	
FIGURE 2.6	58
Action-Reflection Model for Teacher Professional Learning	
FIGURE 3.1	81
The Design of the Study	
FIGURE 3.2	83
Data Collection Cycles Identifying Major Methods of Data Collection.	
FIGURE 3.3	84
Process of Semi-Structured Interview Development	
FIGURE 3.4	89
Action-Reflection Model used in the Present Study.	
FIGURE 4.1	104
A Snapshot of Centenary Kindergarten.....	
FIGURE 4.2	119
Susie’s LSJ1 Documentation for Introducing the Digital Camera	
FIGURE 4.3	120
Susie’s LSJ1 Entry from Page 3	
FIGURE 4.4	121
Children Exploring with the Digital Camera	
FIGURE 4.5	123

Susie's LSJ1 Entry for Page 4.....	
FIGURE 4.6	124
Girls Posing and Pulling Faces for the Camera.....	
FIGURE 4.7	124
Boys Posing and Pulling Faces for the Camera	
FIGURE 4.8	125
Children's Photographs of Each Other at the Beginning of the First Cycle	
FIGURE 4.9	125
Sample of Photographs of Objects taken by Children Early in Cycle One.....	
FIGURE 4.10	125
Artistic Representations in Photographs taken by the Children.....	
FIGURE 4.11	126
Chris and Jessica doing the 'V' symbol for a photograph	
FIGURE 4.12	127
Photographs taken by George at Science Works.....	
FIGURE 4.13	128
Photograph taken by Joe and Artefact collected for LSJ1	
FIGURE 4.14	131
Excerpt from Susie LSJ1, p.6.....	
FIGURE 4.15	131
Susie and the Children Creating Snack Bear's Locker	
FIGURE 4.16	137
Artefact Column of Susie's LSJ2, p. 1	
FIGURE 4.17	138
Jenna's Collage and Caption in Susie's LSJ2, p. 2	
FIGURE 4.18	139
Excerpt from Susie's LSJ2, Pet Rocks.....	
FIGURE 4.19	140
Pet Rock Holiday: Photographs taken by Children and used in Storytelling.....	
FIGURE 4.20	142

Children incorporate the Digital Camera into their Play	
FIGURE 4.21	143
Excerpt from Susie's LSJ2, p.3	
FIGURE 4.22	145
Working with the Portable DVD Player	
FIGURE 4.23	145
Excerpt from Susie LSJ2, p. 4.....	
FIGURE 4.24	147
Excerpt from Susie's LSJ2 showing Children exploring the Multimedia Presentation.	
FIGURE 4.25	150
Excerpt from Artefacts Column in Susie's LSJ 2, p.6	
FIGURE 4.26	151
Sending an Email during Vet PlayLearning Episode	
FIGURE 4.27	152
Susie's LSJ2, p. 7.....	
FIGURE 4.28	154
Extract from Susie's LSJ2, p. 8.....	
FIGURE 4.29	155
Extract from Susie's LSJ2 p. 9.....	
FIGURE 4.30	161
Photographs taken by George and William.....	
FIGURE 5.1	165
A Snapshot of St Stephen's.....	
FIGURE 5.2	177
Excerpt from Mollie's LSJ1, pp. 4-5.....	
FIGURE 5.3	180
Excerpt from Mollies LSJ 1, p. 14	
FIGURE 5.4	183
Excerpt from Mollie's LSJ1 showing Entry for Group Narratives, pp.5-6.....	
FIGURE 5.5	184

Excerpt from Mollie's LSJ 1, pp. 7-8.....	
FIGURE 5.6	185
Excerpt from Mollie's LSJ describing Group Narrative School Based Podcasts, pp. 10-11.	
FIGURE 5.7	185
Children Recording Narrative School Based Podcasts	
FIGURE 5.8	186
Children in Mollie's Classroom working on Individual Sustainability Newsletters using PAGES Template.....	
FIGURE 5.9	186
Excerpt from Mollie's LSJ1 in Reference to Prep Newsletter, pp. 7-8.....	
FIGURE 5.10	188
Excerpts from Mollie's LSJ1 describing the 'Junk Art' Activity	
FIGURE 5.11	190
Excerpt from Mollie's LSJ1 documenting Children's Independence when using Technology	
FIGURE 5.12	200
Excerpt from Mollie's LSJ2 describing 'Learning on the Go'	
FIGURE 5.13	201
Learning on the Go (LOG).....	
FIGURE 5.14	202
Excerpt from Mollie's LSJ2 describing Children's Interest in the Inquiry.....	
FIGURE 5.15	203
Excerpt from Mollie's LSJ2 detailing Cranberry Land Care Excursion, p.6	
FIGURE 5.16	204
Excerpt from Mollie's LSJ, p. 5	
FIGURE 5.17	206
Photographs of the Planning Sheets used for Life Cycle Animations.....	
FIGURE 5.18	208
Excerpt from Mollie's LSJ Slowmations pp. 7-9.....	
FIGURE 5.19	210
Screen Captures and Transcript from Meg and Sam's 'slowmation'	

FIGURE 5.20	211
Excerpt from Mollie's LSJ showing Documentation for St Stephen's podcast.	
FIGURE 5.21	212
Large 'Story of St Stephen's' Timeline and Ned recording his Timeline Podcast.	
FIGURE 5.22	214
Screen Captures and Transcript of 'The story of St Stephen's' from a Preparatory Child.	
FIGURE 5.23	216
Children's Draft Books and Published Newspaper Articles.	
FIGURE 5.24	219
Transcript of Mollie's Podcast of School Narrative Instructions	
FIGURE 5.25	220
Photographs of a 'Share Circle' using Podcasting Software to Record Children's Feedback	
FIGURE 5.26	223
Excerpt from Mollie's LSJ2 describing Publishing the School Narratives.	
FIGURE 5.27	225
Student Work Sample: School Narrative	
FIGURE 5.28	226
Transcript of 'Spud Maths' Interview	
FIGURE 5.29	242
Excerpt from Mollie's LSJ1	
FIGURE 6.1	280
Model of Cambourne's Conditions of Learning showing Engagement at the Centre of Learning.	
FIGURE 6.2:	280
Cambourne's (1995) Conditions of Learning Re-contextualised for the Young Literacy Learner in the 21 st Century.	

CHAPTER 1:

THE STORY BEGINS

Where shall I begin, please your Majesty?” he asked. “Begin at the beginning,” the King said, gravely, “and go on till you come to the end: then stop.”

Lewis Carroll

1.1 Introduction

This study had its origins in my story. My professional career began as a primary school teacher. It is through my experiences as a literacy educator in the early years classroom that a deep interest in early literacy education and the potential of technology to transform literacy learning began to emerge.

My early teaching career was heavily influenced by the work of Holdaway (1979), Graves (Graves, 1983; Walshe, 1981b) and Cambourne (1995) and the concepts of “whole language” philosophy, ‘process writing’ and Cambourne’s (1995) conditions of learning.

What became evident to me during my teaching journey was the need for teachers to know and understand children’s knowledge and learning prior to their commencing school and to value the literacy learning that has occurred before they enter formal education. Terms such as *scaffolding learning* by adjusting the level of adult support to foster independence in children’s learning, and the *zone of proximal development* (ZPD) (Vygotsky, 1978), were part of the rhetoric of my professional dialogue. It seemed however that there was little knowledge of the complexity of children’s literacy learning in the early years of education (kindergarten and preparatory or the first year of formal schooling).

During my school’s participation in the ‘Early Literacy Research Project’ (ELRP) (Hill & Crevola, 1998) it became evident to me that despite our very best efforts at implementing the *Early Years* program there remained concerns for the number of children who seemed to be disengaging with literacy learning. These concerns encouraged me to question my beliefs about literacy learning. Later, when I took on the role of technology coordinator, I began to wonder about the relationship between technology and literacy and the implications of this relationship for teaching and learning.

I decided to move away from the technology skills based approach of the previous technology coordinator whose discipline specialty was mathematics, and I began to explore working with technology and literacy, drawing on a wide range of resources beyond the walls of the computer laboratory. Projects like the *Skate Park* gave me new ways of thinking about literacy and technology.

In this project, with the collaboration of the art teacher, students designed and created their own three dimensional models of a skate park as they observed the progress of one being built in the local community. Whilst architecturally the models may not have been award winning designs, the final results of the students' work were inspirational in terms of *quality* and *student engagement*. Using an integrated approach the children designed, created and evaluated their own skate parks. The computer lab, the library, the art room and the surrounding corridors became a place for active learning and collaboration. Children were using and developing their literacy knowledge, understanding and skills in conjunction with their library searching skills, their problem solving and critical analysis knowledge and understanding, not to mention the development of their visual art knowledge and presentation skills. Computer technologies such as drawing programs and word processing, publishing software and presentation tools enabled them to share and integrate text and artwork far more comprehensively than working without this technology would have permitted.

Prompted by these and other similar experiences in the classroom, I found myself formulating an idea that teachers, as mediators of young children's experiences with technology, played an important role in ensuring that literacy learning experiences had some connection to the world outside of school and were consistent with the discourses that children experience every day. It seemed that this was particularly important in the early years of education. Hence I found myself wanting to explore what other teachers in the early years perceived of the two entities of technology and literacy and how they interweaved technology and literacy into their early years learning environments. However, if my notions of early years educator experiences of the relationship between technology and literacy were to be explored deeply, I needed to do more than simply have a conversation with early years educators. I needed to walk with teachers to gain insight into their lived experiences of the relationship between technology and literacy in their early years learning environments. Such was the genesis of this thesis.

1.2: Context of the Research

This study sought to explore early years educators' experiences of the relationship between technology and literacy in early years learning environments. Whilst my own passion for technology and delivering quality literacy education in the early years has contributed to the formation of this study, the literature suggested that educator beliefs and practices are influenced by changing literacy perspectives. As educators mediate or control the experiences that young children have with technology, the educator was pivotal to the study. The following section provides an overview of the changing landscape that has contributed to the context of the research. The literature pertaining to these perspectives is described in detail in Chapter 2.

The Macquarie Dictionary (Yallop et al, 2005) describes technology as "equipment, tools" (p. 1446). Throughout the study 'technology' refers to tools, equipment or techniques used in processes and which are predominantly, but not exclusively, digitally based. For example, a book was once

considered technology for the reading process and today information and communications technology (ICT) can be viewed as technology for communications processes (Jonassen, Howland, Marra & Crismond, 2008). The application of this view acknowledges that technology is not the communicator of meaning but engager and facilitator of thinking (Jonassen et al, 2008). Further, unless otherwise indicated, the terms *early years educator* and *teacher* are used interchangeably in reference to the educators of young children in prior to school and the early years of formal education contexts.

1.2.1: The Changing Landscape

The past 20 years has seen significant changes in literacy and technology education. In 1992 Bigum and Green drew attention to the tensions between prevalent literacy and technology pedagogies. In a political climate of economic rationalist viewpoints, literacy and technology were tied to employment opportunities and work. However, theorists were arguing that an emphasis on skills based approaches to literacy and technology was not what was needed in for the future. Bigum and Green (1992) argued for “a cultural- critical perspective on both literacy and technology and an holistic view of the nexus between literacy pedagogy and the new technologies” (p. 24). They called for educators to understand the relationship between literacy learning and the social and cultural contexts of learners. This position requires educators to develop, in learners, a critical awareness and understanding of the social and cultural meanings embedded within the broad range of texts used in society.

At about the same time three competing literacy paradigms characterised literacy education: functional literacy, critical literacy and cultural literacy. The first, *functional literacy* contends that essential literacy skills, such as decoding the printed word, need to be mastered for employment and work. Others argue that literacy is about more than teaching a prescribed set of skills. These theorists put forward the second paradigm of *critical literacy* as being “about the distribution of knowledge and power in society” (Luke, 1993, p. 4) and exploring the power relationships that exist between literacy and knowledge in society. The third paradigm, *cultural literacy* acknowledges the influence of culture and community on literacy learning and that culture underpins literacy understanding (Bigum & Green, 1992; Lankshear & Snyder, 2000). From this perspective “reading and writing can be understood and acquired only within the context of the social, cultural, political, economic and historical practices to which they are integral” (p.26).

Of these three literacy paradigms, Bigum and Green (1992) proposed that functional literacy provided the strongest nexus between literacy and technological discourses, through measurable outcomes and skill based content, well suited to a “culture of compliance” (p.7). Thus in the early nineties, computer technology provided a wealth of rote learning opportunities for literacy in the form of simple, linear computer based programs where a passive ‘correct’ response in a prescriptive environment provided a superficial quantitative measure of concrete skill acquisition or compliance. Deeper learning, understanding and knowledge however, were questionable in these conditions. Biggs

(2003) distinguishes between surface learning fostered through passive teaching approaches such as that inherent in functional literacy, and deep learning which stimulates higher order thinking. For deep learning and higher order learning to take place then, a different kind of literacy and technology nexus is needed, and a literacy paradigm that highlighted deep learning and expanding literacies. Thus, by 2000, the need for a metalanguage for evolving multiliteracies was apparent (Unsworth, 2002) and the concept of critical literacy was expanded to multiliteracies through the work of The New London Group (1996) and others who recognized the “plurality of literacies” (Comber, 2001, p. 168). Prominent discourse continued to suggest evolving paradigms should include cultural – critical perspectives with due consideration to the notion of changing literacies and the changing dimensions of literacy (Kalantzis, Cope, & Harvey, 2003; Lankshear & Knobel, 1997; Unsworth, 2002). In short, the rhetoric advocated the need to re-contextualise literacy (Durrant & Beavis, 2001a; Kalantzis et al., 2003; Unsworth, 2002; Zammit & Downes, 2002) and transform curriculum (Kalantzis, Cope, & The Learning by Design Group, 2005; Zammit & Downes, 2002) to meet the needs of the emerging knowledge society. Globalisation and continued advancements in information and communications technology (ICT) gave rise to new and newly emphasised literacies (Kalantzis et al., 2003; Labbo, 2006; Lankshear & Knobel, 2006). For example, the ability to navigate around a web page requires an understanding of the placement of text and images on the page to draw the viewer’s attention (visual literacy) and the ability to navigate around the page and follow hyperlinks to other pages. The skills, knowledge and understandings required to be literate with continued advancements in technology demand recognition of dynamic, complex and deep learning. It is argued that transformational learning occurs when children become *knowledge producers* rather than *knowledge consumers* (Kalantzis et al., 2005) and thus engage in deep learning. Locke and Andrews (2004) state:

...while changes in technology have a role to play in the transformation of literacy, so new literate practices can serve to transform technology. For this reason impact needs to be thought of symbiotically, with technologies and literacy practices mutually transforming each other. (p. 126)

Research then, needs to explore how technology can foster transformational literacy learning in contemporary society.

The emergence of new technologies and new literacies had implications for classroom practice. The demand on educators to acknowledge new literacies and the pull of traditional literacy (Labbo, 2006) in pedagogical practice requires literacy practices to be evaluated. Theorists urged educators to embrace new ways of teaching and learning that would prepare children for the world they will live in as adults (Durrant & Green, 2000; Edgar & Edgar, 2008; Elkind, 2007; Kalantzis et al., 2005; Kellner, 2002; Knobel, 2006; Lankshear & Snyder with Green, 2000; Unsworth, 2002). Further it was anticipated that such pedagogies would engage expanded views of text and value collaboration, diversity and the ability to problem solve in different ways (The New London Group, 1996). Historically thus, the context moved from singular literacy perspectives and the use of relatively simple technology to a learning environment rich in multiliteracies and complex

technologies. While innovative practice was required, change in practice alone was not enough, as expanded views of literacy needed to be reflected in curriculum and pedagogy for the potential of technology to bring about transformational learning to be fully realised (Turbill & Murray, 2006).

1.2.2: From Rhetoric to Curriculum

Several initiatives provide a context for the research study. The Victorian Essential Learning Standards (VELS) is the curriculum framework currently used in Victorian schools. The National Early Years Learning Framework (NEYLF) and the Victorian Early Years Learning and Development Framework (VEYLDF) were initiatives newly implemented at the time of the study and the Australian Curriculum was in the final stages of development. For early years educators in the state of Victoria this is a time of change. It is this period of change and unprecedented interest in the early years of education that has contributed to the context and formed the backdrop to this study.

Expanding views of literacy and technology in education led to various government bodies responsible for education portfolios addressing the relationship between literacy and technology in the curriculum. For example, in 2005 the Victorian Government launched a new curriculum framework, the Victorian Essential Learning Standards (VELS) (Victorian Curriculum and Assessment Authority [VCAA], 2005). One of the key aims of this reform was to prepare students for

...a world which is complex, rapidly changing, rich in information and communications technology, demanding higher order knowledge and understanding, and increasingly global in its outlook and influences. (VCAA, 2005, p. 2)

Within this curriculum document areas were identified as disciplinary or interdisciplinary. English and Mathematics were placed in the *disciplinary* strand but Technology was labelled an *interdisciplinary* strand. This meant that it functioned within other disciplines and with learning also occurring both inside and outside of the school (VCAA, 2005). The placement of English and technology in separate strands highlighted the government strategy to interweave technology across the curriculum.

The new Australian curriculum (The Australian Curriculum Assessment and Reporting Authority [ACARA], 2011) follows this pathway too. Information and communications technology (ICT) is described as a *general capability* and as thus it is expected that student skills, knowledge and understandings in technology will be developed across the curriculum and outside of school. In the national curriculum a distinction is also made between English and literacy with English identified as a core learning area and literacy as a general capability “to expand the repertoire of English usage (ACARA, 2011). In the English curriculum literacy is identified as a strand alongside language and literature, and multiliteracies are embedded throughout. It would appear that there has been a strong attempt to acknowledge current rhetoric surrounding literacy and technology through the use of language associated with expanded views of literacy across all three strands. However, whether or not

the final version and the implementation of the Australian curriculum will change practice remains to be seen.

The development and implementation of the *National Early Years Learning Framework* (NEYLF) (Department of Education Employment and Workplace Relations for the Council of Australian Governments, 2009) from birth to five years, and the Victorian Early Years Learning and Development Framework (VEYLDF) (Department of Education and Early Childhood Development [DEECD], 2009) from birth to eight years, have added further complexity to educator understanding of literacy and technology in the curriculum. Just like the previously described curriculum frameworks make reference to literacy practices that incorporate prevalent contemporary views of literacy and technology. One of the many challenges associated with the range of curriculum documentation facing early years educators in Victoria is which documents to use to inform practice. This leads to an air of uncertainty for teachers.

The development and implementation of the Victorian curriculum and framework documents in schools and early childhood education settings has not been without tension. In the early years of education some of these tensions relate to prevailing views of literacy that have strong roots in functional literacy perspectives and print based pedagogies. In the present economically driven educational climate there is a push to re-contextualise literacy and in doing so embrace new digital literacies and incorporate print based literacies (Labbo, 2006). Andrews (2004a) suggests the difficulty for educators is to develop pedagogy that both fits with the rapidly changing nature of ICT and benefits student learning. This may involve the exploration of new ways of learning, thinking and accessing information. Theorists acknowledge that the development of new pedagogies for literacy learning is challenging (Green & Bigum, 1993; Lankshear & Knobel, 2006; Locke & Andrews, 2004) but essential if we are to prepare students for living in a digital world. Locke and Andrews (2004) argue the need “for conceptual studies that theorise the nexus between ICTs and literacy-centred practices and which project a vision of what a technology infused classroom may look like” (p. 146). At present evidence of the effective integration of technology in the early years of education is scarce (Labbo, 2006; Turbill & Murray, 2006) as many early years educators continue to use ICT as a tool for print based skill practise or as a reward. Further insight then is needed into why early years educators use technology in the classroom in the ways that they do. It would seem that teacher beliefs and understandings about literacy and technology and how these beliefs are embraced in pedagogical practice require further study as it remains undisputed that new pedagogies are needed to respond to a changing learning environment (Walsh, 2006b, 2010). The gap, as articulated by Andrews (2004b), may be in the beliefs and assumptions about literacy that educators bring to the classroom and those that children bring along to education settings. Andrews (2004b) argues that “in terms of transformations in learning, it is the teacher who matters more than the ICT” (p.61). It follows then that any study exploring teachers’ experiences of technology and literacy in the early years of education needs to begin with teachers and their beliefs and lived practices. As part of this exploration

what is needed is insight into how teachers in the early years of education both interweave and mediate children's technology use in the literacy context. This was the focus for this research.

1.3: Purpose of the Study

The purpose of this research was to explore teacher pedagogy in relation to the application of technology to the literacy context in the early years of education. In particular, the study focused on the pedagogical practice of teachers of children in kindergarten and in their first year of formal education (4-6 year olds). In recognition of key concerns raised in the literature, insights into early years educator application of technology to the literacy context were sought through an understanding of teacher beliefs and assumptions about technology and literacy practices, and through their parallel implementation in practice.

The research study was qualitative in design. It used a narrative methodology with the researcher assuming the role of participant observer. Specifically, the study explored two early learning environments; one four year old kindergarten or prior to school setting, and one preparatory classroom or first year of school setting. Narrative inquiry searches for meaning in the lived stories of persons or environments being studied (Lodico, Spaulding, & Voegtle, 2010). This study sought deep understanding of two early years educators' lived experiences of their individual application of technology to their learning environments. The findings of the narrative inquiry, the participant stories, have then been applied to considerations that inform classroom practice. The discussion of these stories is advanced through the identification of the teachers' skills, knowledge and understandings in relation to technology and literacy, and through the application of the stories to a theoretical model for learning; Cambourne's (1995) conditions of learning, which has widely influenced approaches to early literacy learning in this country.

The study utilised an action-reflection cycle intervention. The use of this model in the present study stemmed from my involvement in an Australian national project, Partnerships in Information and Communications Technology Learning (PICTL) (Pegg, Reading, & Williams, 2007), aimed at enhancing pedagogical approaches towards ICT through university and school partnerships. Findings from the Victorian project, of which I was a team member, reported increased confidence in participants' use of ICT (Jones & McLean, 2006; McNamara, Jones, & McLean, 2007). In this study the model was used for planning and reflecting on the application of technology to the literacy context.

The review of the literature provided insight into a range of technology and literacy perspectives and initiatives that may influence teachers' beliefs and parallel approaches to literacy and technology. Furthermore, the literature identified a need for new approaches to pedagogy that embrace expanded views of literacy, of which several models have been highlighted, and from this review the aims of the study have emerged.

1.4: The Aims of the Study

The aims of the study were to:

1. Establish the beliefs and assumptions about technology and literacy practices which early years educators bring to the early learning environment.
2. Explore ways in which early years educators interweave and mediate technology and literacy use by children in the early years of education.

These aims led to the overarching research question:

What are early years educators' experiences of the relationship between technology and literacy in early years learning environments?

Theorists agree that teacher attitudes and ideologies impact on the effectiveness of the integration of ICT across the curriculum (Andrews, 2003; Beavis, 2001; Snyder, 2001). If early years educators do not believe in the potential of ICT to improve student learning, then the integration of ICT across the curriculum will be arbitrary and its potential for literacy learning will be limited. In addition, it is argued that the use of digital literacies will not transform classrooms if teachers do not feel comfortable using them for educational purposes (Labbo, 2006). These realities suggest the first operational question for the study:

What are the beliefs, understandings and assumptions about technology and literacy practices that early years educators' bring to the early years learning environment?

An on-going concern about the uptake of technology by teachers in the early years of education is that technology continues to be used as a 'tool' or device rather than embraced as part of pedagogy (Labbo, 2006; Turbill & Murray, 2006). For teachers to embrace a pedagogical approach to technology they must develop technological competence and value the use of technology beyond a perception of it as simply a tool for practising print literacy skills. As teachers are powerful mediators of student use and access to technology in the classroom (Andrews, 2004b; Freebody, Reinmann, & Tiu, 2008b; Labbo & Reinking, 2003) professional learning, supportive frameworks and opportunity to trial a range of strategies aimed at providing imaginative, communicative and meaningful learning experiences should be part of any study exploring the relationship between technology and literacy. This important challenge highlights the second operational question:

How do early years educators interweave and mediate technology and literacy use by children in the early years of education?

1.5: The Significance of the Research

Children are growing up in the world surrounded by and, to a large extent, immersed in technology. Therefore, it is imperative that learning that occurs in formal education settings is

authentic and consistent with the digital world that children experience every day. Often teachers do not know what children know about the technology in their world, either prior to school or outside school. The significance of this study is linked to the need for new pedagogies that conceptualise literacy in the digital world (Lankshear & Knobel, 2003; Reinking, Labbo, & McKenna, 2004), and in doing so address disparity between children's literacy and technology experiences in and out of formal education (Beavis, 2001; Comber & Reid, 2007; Marsh, 2003).

This research study is also significant in that it contributes to our understanding of the developing relationship between ICT and expanding literacies through qualitative research that explores the contextualisation of the cultural and social influences of ICT and literacy development. The study explored approaches to pedagogy where the application of technology to the literacy context in the formal educational setting sought consistency with the social and cultural context of technology and literacy in the wider community. Insights gained from this study may add further depth to our knowledge of the complexity of the relationship between technology and literacy in the early years of education.

1.6: Structure of the Thesis

The thesis has seven chapters. This introductory chapter has presented an overview of the researcher's personal experiences and the context for the current study. These have informed the framework for the study and the research aims and questions that are pertinent to exploring educators' experiences of the relationship between technology and literacy in early years learning environments.

Chapter 2 presents a detailed review of the literature related to literacy and technology in the early years of education. The chapter initially explores a range of perspectives and approaches to literacy and technology that may influence a teacher's approach. The second part of the literature review considers the current discourse centred on new ways of teaching and learning to meet the needs of learners in the twenty-first century. This is followed by an exploration of possible approaches to teaching and learning that embrace expanded notions of literacy in the early years of education. Within this exploration a number of models seeking to contextualise literacy education in contemporary society are considered. Finally, the implications of current rhetoric and research about the application of technology to the literacy context for early years educator professional learning is reviewed in order to identify essential considerations for working with educators, which might be applied in the study.

Chapter 3 describes the design of the study and the methodology. It details the theoretical and methodological framework used in the study and reviews literature associated with qualitative, narrative research design and describes the reliability and trustworthiness measures used. Next an outline is provided of data generation, data collection and data analysis techniques applied to the investigation. A description of these techniques is provided with reference to the associated literature.

In keeping within a narrative framework Chapters 4 and 5 present the stories of two early years educators. These stories are presented in chronological sequence with data from the range of sources embedded throughout. Each story provides rich detail of an educator's experience of the relationship between technology and literacy in their early years learning environment.

In Chapter 6 the results of the study are discussed in relation to the application of technology to the literacy context in early years educator practices. Emerging themes from the rich stories presented in Chapters 4 and 5 are discussed in relation to the literature presented in Chapter 2. Throughout Chapter 6 teacher mediation of technology and children's learning experiences with technology are discussed in relation to Cambourne's (1995) conditions of learning and a re-contextualised model stemming from this discussion is proposed.

In the final chapter insights gained from the early years educator stories are summarised in relation to the research questions. The final section of Chapter 7 addresses the implications of the findings for education practice and presents suggestions for further research. The thesis concludes with recommendations for pedagogical practice, teacher professional learning and future research.

CHAPTER 2:

SURVEYING THE LANDSCAPE

An Exploration of the Literature Relating to Early Years Literacy and Technology

Man's mind, once stretched by a new idea, never regains its original dimensions.

Oliver Wendell Holmes

2.1: Introduction

This chapter provides a detailed discussion of the literature and related research in the fields of literacy and technology in the early years of education that have informed the present study. To provide a context for the understanding of educators' experiences of technology and literacy in the early years of education derivations of current practice are considered. Three prevailing literacy paradigms and a range of pedagogies and approaches to literacy and technology are identified that may influence a teacher's approach to the application of technology to the literacy context. This literature was important in informing an understanding of the beliefs and practices of early years educators and how they might align with re-contextualised views of literacy and its relationship with technology.

An argument is put forward for re-contextualising literacy in contemporary society. The literature reveals that this view is well supported but faces challenges in implementation. These challenges are identified to determine how the present study may explore some new insights into possible considerations of approaches to technology and literacy in the early years of education.

The review presents a case for learning environments that are infused with digital technology, a curriculum and pedagogy that embraces expanded views of literacy which incorporates consideration of the relationship between literacy and technology, and paradigms that align children's cultural experience of literacy and technology with experiences in formal education settings. Possible approaches to pedagogy and any research in this area is described. Further, this component of the literature identifies inhibitors to the relationship between technology and literacy and, in particular, highlights a need for teacher professional learning to overcome these inhibitors.

The implications for pedagogical practice and research about the best approaches to professional learning are then considered. One contention is that professional learning will need to enable teachers to reflect on their beliefs and practices related to literacy and technology. The literature in this area was important in informing the design of the research in working with early years educators in the study.

Finally, the chapter concludes with a summary of the key themes in the literature, and a glossary of key words and phrases that were introduced throughout the chapter.

2.2: Derivations of Current Practice

This section explores influences on teachers' approaches to literacy in the classroom. The section begins by describing the emergence of the term 'literacy' and then describes cognitive perspectives that influence a teacher's approach to literacy. Three prevailing literacy discourses are discussed alongside approaches to literacy. The section concludes with arguments for re-contextualising literacy. These arguments highlight the need for educators to understand the impact of technology on society, how technology has changed literacy and the subsequent implications for practice.

Traditionally, the term 'literacy' has been defined as "centred on language only, and usually on a singular national form of language at that, which is conceived as a stable system based on rules such as mastering sound-letter correspondence" (The New London Group, 1996, p. 4). Under this interpretation to be 'literate' is to have control over reading, and writing of print and paper-based text in the national language.

The term 'literacy' emerged in the United States in the 1970s (Snyder, 2008) but Cambourne (2007) describes the 1980s as the period in which the term emerged in Australia. It continues to be used to describe reading, writing, listening and speaking collectively rather than considering each element as a separate entity.

In the current educational context theorists view being 'literate' in the 21st century as having even further layers of complexity which are value laden and highly contested (Snyder, 2008). Where once literacy was described in terms of cognitive ability, literacy today refers to the ability to function effectively in "culturally, linguistically diverse and increasingly globalised societies" (The New London Group, 1996, p. 1). Being 'literate' thus requires the ability to create, communicate and critically reflect on language in order to function effectively in society, and to communicate using a variety of modes and multimodal texts (texts with two or more modes) (Wing Jan, 2009). This view of 'literacy' refers to communication through a variety of texts. This is the view of literacy used in this study.

Contemporary theorists of emergent literacy argue that an agreed upon view of emergent literacy remains elusive due to the wide range of opinions from different fields that contribute to the concept. However it is widely accepted that the term 'emergent literacy' is used in reference to the period of preschool literacy learning through to early literacy learning in the school setting (Hill, Comber, Loudon, Reid, & Rivalland, 2002). 'Emergent literacy' covers two periods; the pre-school period where pre-school literacy learning is traditionally play based and may not involve formal

literacy instruction, and the period of early literacy learning in schools where reading and writing development is fostered through formal processes (Hill et al., 2002).

As this research study explores educator experiences of literacy and technology in the early years of education, comprising both pre-school and early education in the school environment, an emergent literacy lens is required to understand the way in which a broad range of perspectives on literacy and learning surface in a classroom environment. For example, in the pre-school, play based pedagogies may prevail, whereas in the school setting early years educators may embrace pedagogies with an emphasis on explicit teaching of skills or formal instruction. Cambourne (1988) argues that most teachers can articulate why they teach the way they do and that these beliefs co-inhabit theory and visible practice. This argument has implications for this study exploring the nexus between early years educator beliefs and theoretical understandings and their subsequent application of technology to the literacy context.

2.2.1: Cognitive Development and Early Literacy

Several theoretical cognitive development perspectives influence literacy discourse and it would seem that these perspectives will continue to influence early literacy practice into the future. Table 2.1 illustrates the different cognitive development perspectives.

These perspectives have offered fruitful positions from which to look at learning in the early years. Traditional cognitive development perspectives focus on readiness to learn as being a key determinant of learning, and connectionist perspectives can be identified through movements in literacy education which encourage the use of explicit instruction in early literacy, particularly in relation to phonics, reading skills and word recognition. Of particular significance to the emergent perspective is Piaget's stages of intellectual development; sensorimotor, preoperational, concrete operational and formal operational and Piaget's belief that each stage of development can be characterised by the way children think about the world and construct meaning from their experiences (Garton, 2004; Piaget, 1965). However, it is the social constructivist perspective that is pertinent to this study as it is encompassing of the social context in which learning occurs in the early years of education.

Papert (1993) relates constructivism to approaches to learning with technology in education, but the social perspective of Vygotsky (1978) views "learning as a profoundly social process" (p. 131). Social constructivist perspectives maintain that knowledge is constructed:

...when individuals engage socially in talk and activity about shared problems or tasks. Making meaning is thus a dialogic process involving persons-in-conversation, and learning is seen as the process by which individuals are introduced to a culture by my skilled members. (Driver, Asoko, Leach, Mortimer, & Scott, 1994, p. 7)

In other words, "good teaching is a collaboration" (Edgar & Edgar, 2008, p. 227) and children are guided towards mastery through participating in appropriately challenging learning and social

experiences. It follows then that at the core of social constructivist perspectives is a time when learners are actively engaged in learning through involvement in relevant tasks and being supported in communities of collaborative enquiry (Driver, et al., 1994). The social constructivist perspective has significance for this study in that children enter formal education having had a myriad of experiences with technology and come together to learn collaboratively in the early years setting. It would seem that this perspective takes into consideration the appropriateness that the social context for learning provides for the application of technology to the literacy context.

TABLE 2.1
Cognitive Development Perspectives that Influence Early Literacy Discourse

Traditional		Contemporary		
Maturational	Developmental readiness	Connectionist	Emergent	Social constructivist
1. Learning occurs when children reach the appropriate mental age for the learning. Behaviour (Hill et al., 2002).	1. Learning is nurtured through learning experiences designed to promote skill development. (Hill et al., 2002).	1. Learning is nurtured through learning experiences designed to promote skill development. 2. Uses overlearning as a strategy to solidify skills (Hill et al., 2002).	1. Draws on theories of cognitive developmental stages of learning. 2. Learning occurs when learners are Immersed in print rich environments where approximations, engagement and risk taking are encouraged (Hill et al., 2002). 3. Developmentally appropriate practices are implemented	1 Active construction of knowledge by the learner. 2. Informed by Vygotsky's social interactionist theories and views "learning as a profoundly social process" (Vygotsky, 1978, p. 131).

2.2.2 Three Literacy Discourses Influencing Early Years Educator Practices

The literature identifies three prevailing literacy discourses: 'functional literacy', 'critical literacy' and 'cultural literacy'. Bigum and Green (1992) suggest that any attempt to forge these literacies together is fraught with problems as each has its own clear discourse. Given the context of this research it is necessary to acknowledge each perspective and the contribution each makes to current rhetoric regarding the application of technology to the literacy context in the early years of education and the drive to re-contextualise literacy learning (See Section 2.3).

Functional Literacy Perspectives

The first perspective, functional literacy, has arguably been the dominant literacy paradigm because it is closely associated with meeting the needs of the workplace. Bigum and Green (1992) refer to the functional literacy discourse as emphasizing the role of literacy in education and society as tied to ‘efficiency’ and ‘benchmarks’. Terms such as ‘basic skills’ and ‘measurable outcomes’ ensure that this paradigm connects closely with the dominant technology paradigm favouring knowledge as technical in nature and readily identifiable by the emphasis on skills to be mastered. A similar view of functional approaches to literacy is held by Lankshear, Snyder, and Green (2000): “Being literate has been seen as a matter of cracking the alphabetic code, word formation skills, phonics, grammar and comprehension skills” (p .27). Functional approaches to literacy are readily identified in the early years of schooling where an emphasis on the teaching of reading and writing skills may prevail. A functional literacy perspective argues that once these skills have been mastered they can be used for employment and for functioning in society.

Many argue that functional literacy has ‘political’ underpinnings (Bigum & Green, 1992; Lankshear et al., 2000; Lankshear, with Gee, Knobel, & Searle, 1997). It is argued that government policy in Australia has attempted to link literacy to achieving economic goals; the belief being that by raising the standard of reading and writing skills the economy and society will benefit (Lankshear et al., 2000). Furthermore, through the identification of key competencies and the implementation of diagnostic testing, a focus in schools on teaching to measurable literacy levels should prepare individuals for the world of work.

In the state of Victoria the Victorian Essential Learning Standards (VELS) (2005) promotes an interdisciplinary and holistic approach to teaching and learning, encompassing broader definitions of literacy and notions of deep learning, it would seem that this message has been inherently undermined by a state-wide focus on reporting on skill development or functional areas of literacy. Moreover the Federal Government agenda for national testing (NAPLAN) has superseded the Victorian Achievement Improvement Monitor (AIM) and results used to inform the development of the national curriculum framework.

A functional literacy perspective needs to be acknowledged for the influence it contributes to a teacher’s approach to literacy and technology in the early years setting. However, the literacy practices that children need to function effectively in a contemporary society go deeper than functional literacy skills. Hence, a re-contextualised view of literacy must take into consideration other literacy perspectives.

Critical Literacy Perspectives

Gee (1997) describes the second perspective, critical literacy, as “the ability to juxtapose Discourses, to watch how competing Discourses frame and re-frame various elements” (p. xviii). To

understand this statement there is a need to define Discourse. Gee (1999) describes discourse with a lower case 'd' as 'language in use' (p.7); speaking, reading and writing. When more than one of these discourses come together with other things such as beliefs, attitudes, and feelings the human practice is described as Discourse. Critical literacy perspectives are widely recognized for considering the intertwining of Discourses and the way in which Discourse creates meaning; through the unpacking of ideologies, awareness of power relationships and ways in which language can be used to manipulate become evident (Emmitt, Zbaracki, Komesaroff, & Pollock, 2010). As an approach to literacy education, Snyder (2008) describes critical literacy as concerned with examining the politics of meanings in texts that are inherently linked to the cultural and social contexts of their construction. In its extreme form Snyder (2008) argues that the goal of critical literacy is "democratic social transformation" (p. 79) and as an approach it is often criticised for purporting the role of the teacher as the disseminator of knowledge. In classroom practice critical literacy approaches include a focus on the examination of what has been included and excluded in texts and the deconstruction of texts to highlight the way in which words are used to convey meanings (Emmitt et al., 2010).

Critical literacy perspectives provide a backdrop for the examination of texts contributing to the current debate on the infusion of technology across the curriculum in Victorian schools. Of particular note is the move towards 'new basics' that embrace a range of literacy practices and multiple literacies as opposed to 'old basics' that focus on paper-based literacy practices. It is the role that critical literacy perspectives play in developing understanding of current agendas that is important for this study. Bigum and Green (1992) describe critical literacy as a socially critical form of educational theory and if we consider the argument that technology is already deeply embedded in daily routine, then from a societal perspective new technologies continue to change our concept of literacy (Durrant & Green, 2000). Hence, a critical literacy perspective in the early years of education offers understanding of literacy practices in a milieu shaped by technological change and may influence a teacher's approach to literacy and technology in the early years setting.

Socio-cultural Literacy Perspectives

The third literacy perspective, a socio-cultural perspective, acknowledges that children learn "different things in different ways in different cultures and communities" (Clay, 1998, p. 1). In recognition of every child's individual literacy journey Clay (1998) emphasised the need to acknowledge the influence of culture and community on literacy learning. Clay (1998) argued that children in all cultures are well adapted for language learning. From Clay's point of view good teaching in the early years of education could be identified in the teachers' ability to find out what the learner knows about literacy from learner experiences beyond the classroom and build on these in the classroom literacy program. A similar view is highlighted by Hill et al. (2002) acknowledging that "children's learning at home, in the community and in school are all important socio-cultural contexts for understanding students' emergent literacy success" (p. 6). It is argued that an understanding of the socio-cultural context enables teachers to focus upon what children know about literacy upon entering

school rather than what children do not know. A socio-cultural perspective is important for this study as it acknowledges the influence of children's digital technology experiences prior to formal education and outside of formal education on literacy learning.

The notion of developing continuity between home and school literacy experiences is not new. For example, home - school connections have been advocated as an essential component of the Early Years model (Early Years of Schooling Branch, 1999) since 1996. In particular, documented in the Early Years Professional Development Manual is a commitment to home - school partnerships as a key strategic focus: "It is well understood that where there is a strong partnership between the school and the home, children's learning is enhanced" (Early Years of Schooling Branch, 1999, p. 4). Models such as the Early Years Literacy model acknowledge the significance of the broader socio-cultural context of literacy learning beyond the school classroom, although there may be some argument that there is a misplaced emphasis on these models in attempting to make home environments more like school. In other words models such as these may acknowledge that different socio-cultural backgrounds emphasise different literacy competencies; however efforts to develop home - school connections have merely reinforced the dominant social-cultural group and often alienated those who cannot change to fit this group or do not fit the status quo (Luke, 1993). Luke (1993) views the way in which schools reinforce the language competencies of the dominating social and cultural groups in the wider society as maintaining status quo. He reminds us that "children's differing levels of achievement of literacy are key factors in unequal educational and occupational outcomes" (p. 15). It is argued that the more exposure children have to 'mainstream' groups and culture the more likely they are to integrate and learn in 'mainstream' education systems; as in effect the families and immediate communities of these children have been preparing them for school since the day they were born, and schools have valorised mainstream literacy practices (Arthur, 2001; Hill, 2004). Gee (1993) uses two transcripts of children talking at 'share time' to demonstrate this point. The first transcript refers to a 5 year old child from a middle class background. The transcript provides evidence of the way in which home based language activities connected with children's literature fit comfortably in school practice. The second transcript of a 7 year old coming from a lower socio-economic background reveals that this child interprets 'share time' in a different way. The second child takes the task literally and engages in poetic performance similar to the oral storytelling that is part of familiar home based language. The first example of home based language practice connected to children's literature resonates with school based literacy practice. The home based language practice in the second example connects to oral story telling; something that is a deep part of the cultural history of the child, but not of the school.

A socio-cultural approach acknowledges the contributions to literacy as they occur in homes and communities and the variations to these that occur in different social groups. The funds of knowledge that children bring with them to learning can then be used to transform learning for themselves and others (Kennedy & Surman, 2007). Cultural and social factors influence individual

children's literacy orientations in the early years of education (Turner & Turbill, 2007) but as Lankshear et al. (1997, p. 33) note this can be used to 'tune' children into learning rather than 'tune' them out. Similarly, for Martello (2007) a socio-cultural perspective on literacy for early childhood educators is beneficial "because it recognises the interplay between social and cultural practices and literacy practices, and therefore the variability for what counts as literacy" (p. 90). For example, a child's sense of belonging can be fostered through the early social and literacy experiences and these experiences should become the foundational point from which learning occurs (Healy, 2004). Further, Comber and Reid (2007) describe a sense of identity that children can achieve through learning in play based environments where children can use their cultural resources and demonstrate their rich understandings of literacy and language through play.

A socio-cultural perspective of literacy is relevant to this study as it may influence a teacher's approach to literacy and technology in the early years setting. This perspective of literacy embraces the changing nature of literacy and the many ways this may manifest in the classroom through diverse literacy practices.

2.2.3: Traditional and Progressive Approaches to Literacy Education

This section explores the literature about approaches to literacy education whose roots are deeply embedded in one or more of the theoretical perspectives previously described. The ways in which a teacher applies technology to the literacy context in the early years setting may be influenced by one or more of these approaches. Thus, it was important to identify the influences on teacher pedagogy that may emerge throughout the study.

Cambourne and Turbill (2007) describe traditional approaches to formal literacy education as "explicit and systematic teaching of reading, direct instruction in the sub skills of reading...or balanced literacy instruction" (p. 9). They argue that the socio-political climate in Australia in recent years has contributed to the widespread support for these traditional approaches. A similar view is held by Snyder (2008) who refers to the Howard government years as contributing to a skewed literacy perspective with the media in Australia portraying a strong push towards traditional approaches. These traditional approaches to literacy, it is argued, were prevalent in the 1960s whereby discrete skills such as phonics and handwriting were taught as separate subjects (Cambourne & Turbill, 2007). Today, traditional approaches to literacy emphasise rote learning practices such as flashcards and spelling drills, word lists to be mastered before books can be read, repetitive skill worksheets and the teaching of letters and sounds in isolation (Cambourne & Turbill, 2007; Snyder, 2008) and "children are also taught that letters make sounds and sounds form words and that words have meaning" (Snyder, 2008, p. 50). For the purposes of this study it is necessary to acknowledge that traditional approaches to literacy may be embraced as part of early years educator practice. However, we would expect that research in the field of literacy education in recent years would have

contributed to changes in practice that align more closely with literacy practices in the world in which children are living today.

Progressive approaches to literacy are strongly influenced by constructivist perspectives (Cambourne & Turbill, 2007). Cambourne and Turbill (2007) identify a range of terms that have been bundled with progressive approaches including “contextualised learning, integrated learning, meaning-centred learning, holistic learning, mindful learning and constructivist” (p. 9). The underlying focus on ‘process’ and meaning making of progressive approaches to literacy (Cambourne & Turbill, 2007) are of particular interest for this study as progressive approaches to literacy view learners as constructing meaning throughout the literacy learning process. With the onset of progressive approaches to literacy in the 1970s came an emphasis on children being read ‘to’ and a range of engaging reading materials emerged in classrooms (Cambourne & Turbill, 2007). Progressive approaches have implications for this study as expanded views of literacy may lead to a need to expand the range of engaging literacy materials in classrooms.

A progressive approach that may influence early years educator practice in this study is language experience. Using the language experience approach children begin to learn to read with texts created from their own personal experiences (Hill, 2006). This approach involves children dictating a personal experience to the teacher who then writes it down for the child who reads it back, illustrates it and the finished book then becomes part of the reading material in the classroom. The question that needs to be asked in relation to this study is how this approach is utilised when technology is applied to the literacy context? As an approach that is widely used in early years settings perhaps there is a need for it to be reframed in the current literacy context.

Another key progressive approach that surfaced in the 1960s (Snyder, 2008) was the ‘whole language’ approach. Snyder (2008) describes the similarities between ‘whole language’ philosophy and constructivism in terms of sharing basic tenets, particularly in regard to guiding children in the learning process to take responsibility for their learning and to engage children in authentic reading and writing learning experiences where “skills are taught in context and assessment is also contextualised, emphasising children’s individual growth as well as their accomplishments” (p. 51). Whole language as an approach is holistic (Cambourne, 1988). For example, in a whole language approach reading is taught as a meaningful unit and instruction begins with whole texts in which sub-skills are developed from the whole. As the term whole language implies, “it is undivided, and it is integrated and unified” (Goodman, 1989, p. 210). This view draws on the social, functional – linguistic research of Halliday (1984) concluding “that we learn through language while we learn language” (Goodman, 1989, p. 210). Gannon and Sawyer (2007) differentiate between ‘whole language’ approaches and ‘phonics centred’ approaches by describing them as being at polar ends of the early literacy learning theory spectrum:

...one [phonics centred approach] begins with bits of language and build up from them, the other ['whole language'] begins with meaningful language in whole texts and derives sub-skills from these: 'top-down vs. bottom up' in an earlier parlance. (p.34)

The debate surrounding these two views resulted in two distinct pedagogies that continue to be contested today (Cambourne & Turbill, 2007).

Despite debate surrounding 'whole language' and 'phonics centred' approaches, by the late 1980s 'whole language' was the prevalent approach to early literacy in primary classrooms in Australia (Snyder, 2008). Cambourne and Turbill (2007) refer to the work of Graves (1983) and Walshe (1981a, 1981b) as strongly influencing classroom practices through process approaches to teaching writing that began to highlight for educators connections between reading, writing and spelling. Progressive approaches, and in particular 'whole language' approaches are relevant to this study as they may influence current pedagogy and early years educator beliefs and thus the application of technology to the literacy context.

Cambourne's (1988) Conditions of learning

The 'whole language' movement in Australia is strongly influenced by the scholarly work of Cambourne (1988) whose *conditions of learning* were virtually synonymous with 'whole language' during the 1980s (Cambourne & Turbill, 2007). Cambourne (1988) identifies the conditions of learning; immersion, demonstration, engagement, expectation, responsibility, approximation, use and response, and argues that literacy learning occurs when these conditions are simulated in the classroom. This contention is supported by the fact that Cambourne's (1998) *conditions of learning* have continued to influence early literacy pedagogy including current approaches to the explicit teaching of text types in the primary school (Wing Jan, 2009) and play-based curriculum in early childhood settings (Beecher & Arthur, 2001).

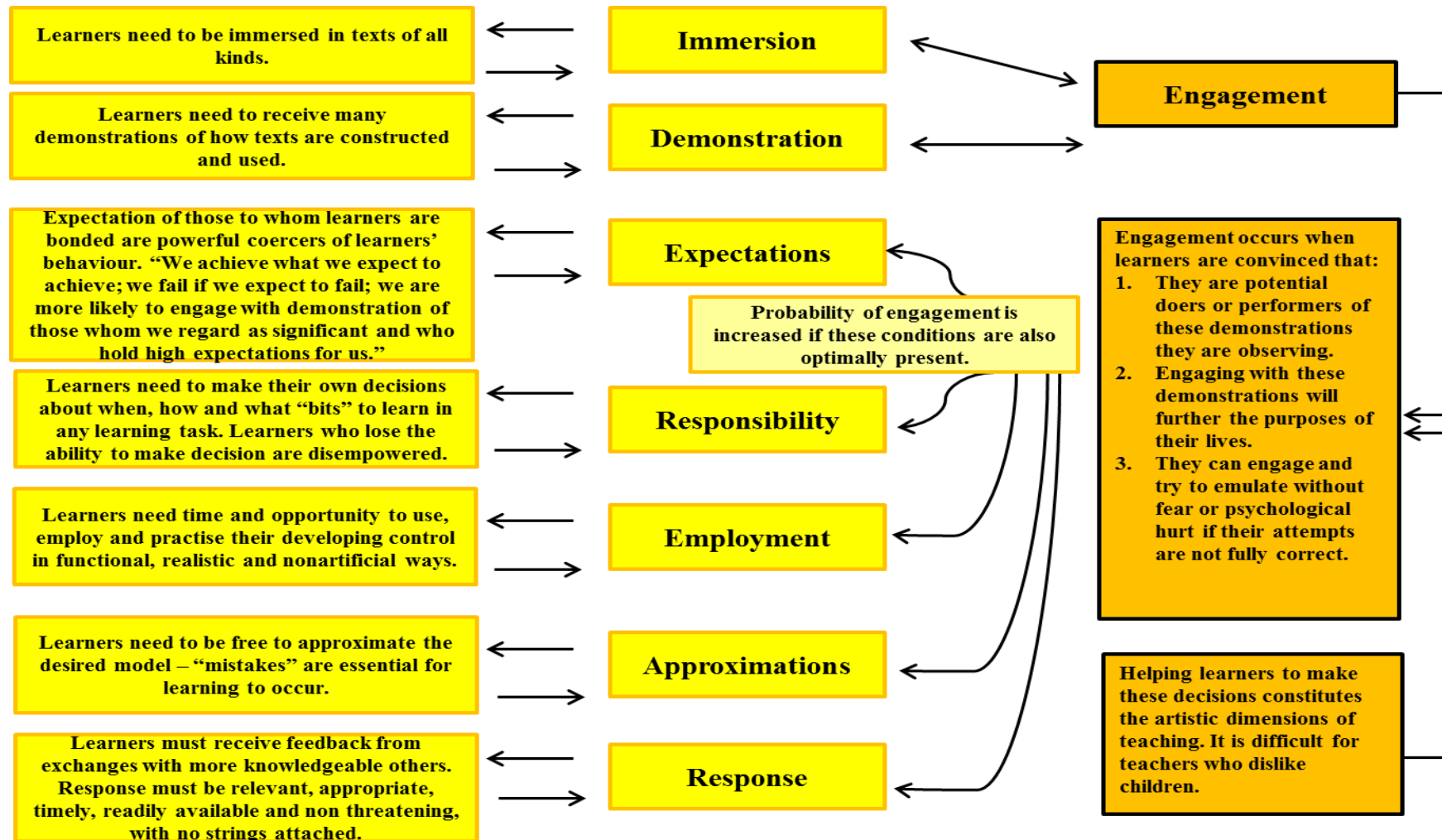
Figure 2.1 provides an overview of Cambourne's (1995) *conditions of learning* applied to literacy learning. Cambourne (1995) argues that when teachers consciously apply these conditions to the classroom literacy learning is fostered, and that literacy learning is increased when the degree in which these conditions are applied is maximised. In addition to the *conditions of learning*, Cambourne (1995) highlights 5 processes for learning. The first process is *transformation* which occurs when a learner demonstrates that the meanings or skills that another has demonstrated have become uniquely theirs. The second process is *discussion* where through interactions with others learners "clarify, extend, refocus and modify their own learning" (Cambourne, 1995, p. 188) and through the third process of *reflection* unconscious language is made explicit. Through the fourth process of *application* Cambourne (2000) recognises opportunity for learners to apply skills and understandings in meaningful ways. Finally through the *evaluation* process learners engage in evaluating their learning through the other processes. The model (*Figure 2.1*) of learning presented by Cambourne (1995)

embraces a synergistic relationship between the conditions of learning and the processes which enable learning to occur.

Cambourne's (1995) model provides a process orientated, child centred approach to literacy learning. However, it should be acknowledged that the *conditions of learning* have not been without critics. Luke, Baty and Stephens (1989) have argued that the conditions of learning are not culturally sensitive and promote middle class practices. Cambourne (1989) has eloquently and convincingly refuted these claims in the Australian context by pointing to evidence from teachers and schools "that they can and do implement the conditions in ways that are sensitive to the cultural backgrounds of the children they teach" (p. 90). The *conditions of learning* have continued to influence early years educator beliefs and practices in the early years of education, thus the model is important for this study as it may influence teacher pedagogy and beliefs in prior to school and early years of education settings. Further, the model is holistic and process orientated and offers some alignment with technology approaches discussed later in this chapter (Section 2.2.5). However, what needs to be considered is the relevance of this model for literacy learning in the 21st century. In this study the conditions of learning are re-contextualised in relation to the findings and discussed in Chapter 6.

FIGURE 2.1

Cambourne's Conditions of Learning (Cambourne, 1995, p.187)



The conditions of learning: A model of learning as it applies to literacy

Explicit Approaches to Literacy

The 1990s signified a time where language and literacy were perceived as cultural capital and pedagogical approaches to literacy fostered critical intelligence in students in an effort to promote social equity (Cambourne & Turbill, 2007). Critical literacy was the prevailing literacy paradigm and attention was drawn to the mismatches between home and school literacy practices and inappropriate use of progressive instruction (Healy & Dooley, 2002). It was during this time that explicit teaching methods emerged in Australian schools. Snyder (2008) points to the example of genre approaches as stemming from a concern that process approaches in the classroom promoted creativity and imagination through narrative, however the social and political agenda required teacher direction on a range of text types beyond narratives. Explicit approaches advocate direct instruction whereby the teacher provides explicit explanations of text types, often to the detriment of creativity (Snyder, 2008). This pedagogy often requires copious amounts of time for teachers to be involved in deconstructing text types and the categorisation of text type structures and grammatical features with children (Cambourne & Turbill, 2007). Explicit approaches to reading are underpinned by the belief that knowledge, skills and understandings need to be “explicitly, systematically and directly, taught” (Cambourne, 2000, p. 416). Explicit approaches to literacy may influence an early years educator’s beliefs and pedagogy and their subsequent application of technology to the literacy context.

Current influences on approaches to literacy

Theorists claim that prevailing pedagogies require a balance of skills instruction and immersion in meaningful learning experiences (Labbo & Place, 2010; Snyder, 2008). The report ‘*In Teachers’ Hands: Effective Literacy Teaching Practices in the Early Years of Schooling*’ (Louden et al., 2005b) detailed effective literacy teaching practices and advocated a balanced approach to reading and writing instruction. Findings from this report put forward explicit teaching, clear explanations, guided practice and careful scaffolding of learning as recommendations for effective practice (Louden et al., 2005a). Of these recommendations scaffolding of learning requires further explanation for this study as it may influence early years educator beliefs and practice.

Scaffolding methodology has its roots in the work of Wood, Bruner and Ross (1976). Their work highlights the role of the adult in supporting the learner by controlling those elements of a task which are beyond the capacity of the learner through “scaffolded functions” (p.98). This concept has evolved through a socio-cultural theoretical perspective, and is influenced by the contribution of Vygotsky’s (1978) work on understanding how performance may be assisted through the zone of proximal development (ZPD). Using scaffolded instruction guided practice is provided at a level that is referred to as the zone of proximal development (ZPD). ZPD “is typically thought of as a person’s range of potential for learning, where that learning is culturally shaped by the social environment in which it takes place” (Smagorinsky, 1995, p. 193). It is considered to be at a level that is not too easy and not too challenging. Vygotsky (1978) referred to ZPD as:

“...the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers.”
(p. 80)

A common example of scaffolded instruction in early primary classrooms is the *Reading Recovery* (Clay, 1993b) program where systematic assessment is used to determine the appropriate level for scaffolded instruction. Once the ZPD is determined guided instruction and practice is carried out within the ZPD and scaffolds are removed as the child develops independence. Hedges (2000) refers to scaffolding in early childhood teachers’ practice as “the process of providing temporary guidance and support to children as they increase competence in areas of development and learning” (p. 17). If careful scaffolding of learning is considered important for effective practice in primary and early childhood education then a scaffolded approach to the application of technology to the literacy context should be considered in this study.

2.2.4: Pre-school Emergent Literacy Pedagogy

This section explores issues surrounding play based curriculum and pedagogy. An understanding of play based curriculum and pedagogy is necessary for this study as it is the prevailing paradigm in prior to school settings and is becoming increasingly popular in the early years of formal education.

Edgar and Edgar (2008) argue that children need time for imaginative play and play in the physical world, as it is through play that children gain important social skills and capacity for literacy learning. In play environments where educators create an environment for *knowing* and *doing* children’s play evolves and changes to reflect the changing culture (Elliott, 2010). Beecher and Arthur (2001) describe 7 qualities of play: play is voluntary; play is episodic; play is influenced by children; play is symbolic; play has its own momentum and focus; play demands children’s participation; and play is pleasurable for players. They apply these qualities to the processes of literacy learning and a child-centred approach to learning (see *Table 2.2*). Beecher and Arthur (2001) suggest that these qualities are expressed through play as children are afforded the opportunity to “connect their personal and world experiences – moving from simple to complex, concrete to abstract understandings, and examining relationships and perspectives” (Beecher & Arthur, 2001, p. 29). It is further suggested that the qualities of play may present challenges when planning for individual development as they are culturally determined and shaped by the experiences, identities and abilities of the children participating in play (Wood, 2010). When children engage in play they work through ideas from real situations by assuming human actions, language and thinking, and in doing so, learn to use language and to self-regulate their activities through their use of language (Hedges, 2010; Whitebread, Coltman, Jameson & Lander, 2009). These views closely align with contemporary play perspectives emphasising the role of culture and adult interactions during play to support learning.

TABLE 2.2

Reflecting the Qualities of Play in Literacy Learning Experiences

Reflecting the qualities of play in literacy learning experiences	
1.	Literacy is learned and used voluntarily. Children choose to use literacy understandings and processes for personal reasons.
2.	Literacy learning and use is episodic. It flows with children's changing purposes.
3.	Literacy learning, use and focus is influenced by children, and by the meanings they carry, as they interact with others and with resources.
4.	Literacy use is symbolic. In roles, children experiment with the processes, conventions, purposes and meanings associated with literacy.
5.	Literacy learning has its own momentum and focus, although children are likely to draw on 'truths' they have learnt from their experiences.
6.	Literacy learning demands children's participation. When children are not involved there is no learning.
7.	Literacy learning is pleasurable for the learners.

Source: Beecher & Arthur, 2001, p. 38

Contemporary play perspectives emphasise that the social context in which a play experience occurs contributes to a full understanding of the experience (Degotardi & Pearson, 2010). These play perspectives have strong roots in Vygotsky's socio cultural theory where children learn through cooperative dialogues with more knowledgeable others (Anning, 2005; Brooker, 2005, 2010; Ebbeck & Waniganayake, 2010; Whitebread & Jameson, 2005), and acknowledge the complexities associated with scaffolding learning as a social and communicative process (Hedges, 2000). Siraj-Blatchford (2009) suggests that through play "the adults that children grow up with, progressively introduce them to the cultural tools that they require to integrate fully as contributing members of society" (p. 87). It is further argued that early childhood educators "may not always acknowledge the cultural dimensions of play" (Brooker, 2011, p. 143) as 'learning through play' may not align with some cultural beliefs about the nature of learning and thus be problematic for parents. It follows then, that an understanding of the roots that play based curriculum has in socio-cultural theory is important for this study as it may influence early years educator experiences of the application of technology to the literacy context.

Martello (2007) reminds us that "beliefs about how children learn literacy are as relevant to the early childhood educator as beliefs about what literacy is, as both will guide everyday educational practice" (p. 91). Thus it comes as no surprise that scaffolding of children's play experiences in early childhood is inherently linked to early years educator beliefs about how children learn. Martello (2007) describes scaffolding in early childhood in terms of adults and peers providing specific assistance to young learners with language and literacy tasks to enable them to eventually be able to complete these tasks independently. Similarly, Hedges (2000) emphasises that children's competence is developed through scaffolding when teachers use strategies to facilitate and extend learning within a meaningful context. These strategies extend to the selection of appropriate materials, routines, scaffolded questions and feedback, with the removal of the scaffolds occurring as the child takes over responsibility for the task.

Contemporary early literacy pedagogies in schools highlight the importance of explicit teaching, opportunity for learners to practise skills and child engagement in meaningful literacy learning. There is some extension of this view to pre-school literacy and play experiences (Martello, 2007). Beecher and Arthur (2001) concur with theorists who argue for a critical-cultural perspective on literacy in early childhood as a means of reaching more equitable learning outcomes for minority groups:

...explicit teaching of the rules, including literacy practices, of the dominant culture is necessary in order for children from minority cultures to be able to successfully use the language of power. This does not mean teaching skills in isolation, but focusing on conventions of Standard Australian literacy within meaningful contexts. (p. 19)

Explicit teaching or direct strategies may be in the form of early years educators becoming leaders in children's play situations or in the form of explicit demonstrations within a meaningful experience. A similar view is put forward by Whitebread and Jameson (2005) who found in their United Kingdom study, with 5 to 7 year olds, using playful approaches to stimulate children's storytelling and creative writing, that "a combination of play (to encourage confidence and creativity) alongside teaching/modelling (to introduce and develop concepts and skills) might provide the best possible pedagogical environment to foster young children's learning" (p. 70). Just as a balanced approach to literacy is advocated in the early years primary classroom, in literacy enriched play experiences in the pre-school setting a balance between direct strategies and indirect strategies through the facilitation of learning is advocated (Beecher & Arthur, 2001).

In the current educational context in Australia prevailing emergent literacy pedagogies in pre-school and school settings advocate a balance of explicit strategies and authentic learning experiences (Snyder, 2008). Snyder (2008) argues that cultural-critical approaches to literacy teaching have been in existence since the 1970s however uptake from teachers is not widespread. A key reason put forward for the lack of widespread support particularly for critical perspectives is "teachers' willingness to engage with new subject knowledge" (Snyder, 2008, p. 81). Teachers, it is argued, assimilate only the parts of theory, such as critical literacy theory, into their existing repertoires, that fit with their beliefs and assumptions about literacy learning.

2.2.5: Technology Perspectives

New technologies and literacy are inherently linked and any resistance to this notion stems from being 'insiders' to previous technologies and 'outsiders' to new (Gee, 1993; Lankshear & Knobel, 1997a, 2006). As 'insiders' educators do not show resistance to what they know and are familiar with, but resistance comes when new technologies challenge educators to move outside our perceived boundaries. It is suggested that changes in our conception of literacy over time are directly related to new advances in technology which have pushed previously defined literacy boundaries to form new conceptualisations.

Bigum and Green (1992) refer to the idea of technologising literacy in reference to the association of ‘literacy’ and ‘technology’. They describe four articulations of this association of which ‘technology for literacy’ is relevant to this study. Current rhetoric (Bigum & Green, 1992; Lankshear & Knobel, 1997b) refers to ‘technology for literacy’ as applying information and communications technologies to literacy practice. It challenges us to consider the significance of how technology is applied to the literacy context of the classroom. Historically technology and literacy paradigms have been considered separately but come together as ‘technology for literacy’ in the current educational context.

Franklin (1992) describes two forms of technological development; ‘holistic technology’ and ‘prescriptive technology’. ‘Holistic’ technological practices are described by Franklin (1992) as being ‘craft like’ in the way that the process of the work is controlled from start to finish by the doer, whereas prescriptive technological practices are recognised by the control exerted over the process. In the educational establishment prescriptive technology practices have prevailed (Bigum & Green, 1992) and theorists now argue that educators must move away from prescriptive technology practices and develop pedagogy for new technology (Luke, 2000). This shift in understanding raises questions about what these new pedagogies will look like.

At the time when computers were being introduced into schools functional literacy perspectives were the focus of political agendas aimed at technologising literacy (Bigum & Green, 1992; Lankshear & Knobel, 1997b, 2006). The discourse surrounding functional literacy placed emphasis on skill based competencies in a similar way to process controlled prescriptive technologies and provided a form of nexus between literacy and technology through entwinement in a functionalist framework. The nexus formed through a parallel history of literacy and technology (Bigum & Green, 1992) remains prevalent today suggesting that new pedagogies call for a cultural-critical literacy and holistic technology nexus that aligns more closely with contemporary views.

2.3 Changing Perspectives – the Drive to Re-contextualise Literacy

The following section describes the current drive to re-contextualise literacy within an ever changing technological world. An understanding of these changing perspectives provides insights into considerations that may be necessary for pedagogical practice when digital technology is applied to the literacy context.

Technology has pushed the boundaries of prevailing conceptions of literacy from spoken to written language, from manuscript to printed literacy, and from print to digital literacy and our conceptualisation of literacy continues to change (Durrant & Green, 2000). Embedded within this understanding is the view that the printed word is not redundant but will be “transformed in relation to new technologies, new cultures and new forms of life” (Durrant & Green, 2000, p. 95). Theorists stress a need to reframe literacy to take account of societal contexts and expanding text forms (Cope &

Kalantzis, 2000) associated with changing technological context and the textual practices that children engage in beyond the school gates (Unsworth, 2002).

Cambourne and Turbill (2007) argue that a reframing of literacy is particularly pertinent to early literacy educators as an expanded view of literacy in the early years of education emphasises the need for children's access to multi-modal and digital texts. Further, in settings where play based pedagogies prevail, children's understandings of language and literacy in their worlds are developed through the incorporation of mobile phones, I-pads, digital cameras supermarket scanners and other digital technologies into their play, further reinforcing this need for expanded views of literacy in the early years (Edgar & Edgar, 2008; Morrow, Barnhart, & Rooyakkers, 2002). In fact, it is in the early years of education Comber (2001) warns that the simplistic and reductive should be avoided:

...in preschools and early childhood classrooms young children need the very best of literacy we can make available, more than old basics, base line functions or simple introductions. We cannot offer the simplistic and reductive in the early years with the assumption that the complex and sophisticated comes later. (p. 177)

The evolution of literacy in relation to education is evident in historical rhetoric. Lankshear and Knobel (2006) remind us that historically the term 'literacy' was not part of educational discourse. Children went to school to learn to read and write words. Embedded in the discourse action was used to describe the practice. These actions; 'reading', 'writing' and later 'listening' and 'speaking' were practices contained within a package called 'English'. It is acknowledged (Lankshear & Knobel, 2006; Lankshear et al., 2000) that Freire's (1972) work with adult literacy in Brazil is considered a forerunner to critical and socio-cultural literacy perspectives and the use of the term 'literacy' within an educational paradigm. Friere (1972) in *Pedagogy of the Oppressed* brought to the forefront the power relations within texts and language through recognition that learning to read and write gave power to individuals as they learned to think more deeply and critically:

As we attempt to analyse dialogue as a human phenomenon, we discover something which is the essence of dialogue itself: the word. But the word is more than just an instrument which makes dialogue possible; accordingly, we must seek its constitutive elements. Within the word we find two dimensions, reflection and action, in such radical interaction that if one is sacrificed – even in part – the other immediately suffers. There is no true word that is not at the same time of praxis. Thus to speak a true word is to transform the world. (p. 75)

Freire's (1972) work contributed to a growing awareness of adult literacy in Western society and acceptance of the need to embrace more inclusive socio-cultural perspectives on education. This movement led to the term 'literacy' being adopted as constitutive in educational discourse. However with continued technological advancements societal conceptions of literacy have again been challenged and the outcome of the current push is the concept of multiliteracies.

Zammit and Downes (2002) say that "to be literate in today's society means to have command of a range of increasingly diverse complex texts and technologies," (p. 25). Similar views are held by other researchers and theorists (Durrant & Beavis, 2001b; Kalantzis et al., 2003; Labbo, 2006; New

London Group, 1996; Snyder, 2002b; Unsworth, 2002). The notion of a multiliterate person rather than a literate person presents new challenges for how we perceive education in the ‘knowledge’ society. It is claimed that literacy needs to be re-contextualised to encompass the “plurality of literacies” (Unsworth, 2002, p. 63) and the broader communication revolution that is occurring (Kress, 2000). In the twenty-first century it can be suggested that multimedia communication is as important as paper based communication. Thus it is essential that literacy pedagogy embraces socially valued literacy practices and in doing so provides access to the range of literacy practices to all children (Healy & Dooley, 2002). Acknowledgement of this broader revolution in communication does not put into question the value of the printed page. In essence, it is argued that whilst the printed page remains central to English, multimodal aspects are becoming an important focus of re-contextualisation (Durrant & Beavis, 2001a) and thus important for this study.

Re-contextualising Literacy

Two ends of a continuum form the basis of opinion on ‘*old basics*’ and ‘*new basics*’ in which the research focus for this study has emerged. ‘*Old basics*’ refers to traditional literacy practices described earlier in this chapter (Section 2.2.3) and ‘*new basics*’ refers to new literacy practices that have emerged for a multiliterate person (Section 2.3). Labbo (2006) argues that we need to value new literacies and traditional literacies in the process of re-contextualisation. Kalantzis et al. (2003) remind us that the basics of old learning closely relate to the world of old work and educators are urged to conceptualise literacy within the context of the changing nature of work (Cope & Kalantzis, 2000; Kalantzis, et al., 2003; Kress, 2000; New London Group, 1996). The New London Group (1996) argues that the emphasis on skills and hierarchy that for so long signified the industrial world has been replaced with notions of diversity, collaboration and divergence in thinking. Furthermore, with technological advances, global and economic change, it is now widely accepted that we are part of a knowledge society dominated by information and communications technology (ICT).

It is acknowledged that children enter formal education with varied digitally based technological literacy experiences, which are not incorporated into the literacy program in the early years of education (Edgar & Edgar, 2008; Green & Bigum, 1993; Lankshear & Snyder, 2000; Marsh, 2003, 2006; Turbill & Murray, 2006; Unsworth, 2001). Prior to school entry most young children have engaged at home in a world of texts far more complex than the world of texts which they are exposed upon school entry (Beavis, 2002). Through clever marketing techniques and technological advancement, children’s early literacy experiences are no longer solely print based. Electronic games, interactive software, media packages, websites and interactive toys are just some of the examples of technology impacting on the complex literacy experiences currently being etched into early childhood. Marsh (2003) points to a strong body of research showing that popular cultural texts such as computer games, environmental print, books linked to television characters and televisual texts are embedded within, and are integral to, children’s literacy practices at home. Marsh (2003) further suggests that parents generally view the use of these texts in a positive way. It follows that education systems may

need to embrace these practices and capitalise on this knowledge which children bring with them to formal education learning environments, in order to improve literacy learning. Beavis (2002) argues that an expanded understanding of texts and literacies is needed to build upon the literacy skills many young children bring with them to school. Similarly Luke (1999) reminds us:

Youngsters raised on the current crop of educational and/or arcade type of games at age 2 or 3, come to school well versed with a very different set of 'literacy' skills from even a decade ago. In that regard, it behoves early childhood educators to re-evaluate their own developmental and literacy expectations of children. (p. 98)

Our education system, as it currently operates, undervalues these early childhood experiences through consistent hierarchical emphasis on print based literacy in school practice (Turbill & Murray, 2006). It is argued that despite children's diverse experiences in relation to digital technologies and multimodal texts, school practices have remained much the same (Arthur, 2001).

Learning in schools should involve making connections between school and the world in which children live through critical literacy approaches. Marsh (2008) claims that young children should be given opportunities to "analyse, understand, respond to and produce texts" (p. 219) using a range of media texts that they encounter outside of formal education. The 'new basics' embrace the critical and socio-cultural perspectives of literacy and the transformational nature of diversification of communications largely attributed to the current technology revolution (Durrant & Green, 2000; Kalantzis, et al., 2003; Unsworth, 2002). Situated within social practices with an emphasis on meaning making in multiple ways within different cultures, (Labbo, 2006) new literacies are described in terms of communication. The implications of new literacies, and in particular visual and digital literacies, on educational practice are challenging. Kellner (2002) puts forward the argument that new literacies need to be developed in conjunction with print literacy if the demands of the knowledge society are to be met through education:

"...educators need to cultivate multiple literacies for our multicultural society, that we need to develop new literacies of diverse sorts, including a more fundamental importance for print literacy, to meet the challenge of restructuring education for high tech, multicultural society and global culture". (p. 154)

Implications for meeting these changing societal needs are far reaching, extending into the classroom when children are very young and impacting not only on child success in the classroom but also in life (Morrow et al., 2002). Comber and Reid (2007) argue for the integration of traditional and new literacies, and believe children will make sense of the texts they come across in their everyday lives. According to Comber and Reid (2007) the challenge for educators is to decide how the old and the new come together in a literacy curriculum for early childhood education. This view finds support in others such as Marsh (2003) who points to research showing that the use of popular culture in formal education can bring schooled literacy and home literacy practices together and Carrington (2001) who concludes that educators need to rethink the basics and how these may be taught more effectively through multimodal technologies.

Multiliteracies and Multimodal Curriculum

The term ‘multiliteracies’ was coined to describe two aspects of the emerging literacy debate: (1) the modes of language representation, and (2), issues relating to ‘local diversity’ and ‘global connectedness’(New London Group, 1996). It was argued that in a globalised, knowledge society a multimodal literacy was needed to make meaning (Cope & Kalantzis, 2000) of communications forms such as email, video conferencing, web pages and chat rooms and that different uses of language became apparent. When viewed in this way multiliteracies “signals the meaning making systems of all communications” (Healy, 2004, p. 19). In the words of Gee (2003) “in the modern world, print literacy is not enough” (p. 19) as being literate today requires literacy across different modes, some of which do not use print at all. A similar view is held by Reinking, Labbo and McKenna (2004) who describe electronic texts as having the tendency to remove written prose from the “centre of textual learning” (p. 80). Kress (2006a) and others describe this domination of ‘visual’ as communication and for the dissemination of information as being crucial to our understanding of what being literate means in the ‘high tech,’ ‘globalised’ world. Gee (2003) uses the example of video games to describe this domination of visual literacy, as signs, symbols, artefacts and diagrams are integrated into video games in different ways for players to interpret. In essence, the rhetoric recognizes the multiplicity of literacy today, as acknowledged by Snyder (2001), “being literate in the context of these technologies is to do with understanding how the modalities are combined in complex ways to create meaning” (p.114).

The second aspect of multiliteracies relates strongly to technological advancement, but in this case in the way that technology is responsible for connecting the world as a global community. In particular, the localisation of cultural and linguistic diversity through technology continues to cross previously defined borders and connect different communities. The way in which we use language is being transformed by communications media (Cope & Kalantzis, 2000; New London Group, 1996) as local communities are increasingly globally connected to the world through television, internet and satellite communications. Thus, even print literacy has taken on multiplicity through the global integration of multiple languages, multiple “Englishes” and patterns of communication across nations (Cope & Kalantzis, 2000).

Kress (2000) refers to multimodality as part of the current communication revolution. Interestingly, he suggests that visual forms of communication may become more valued than verbal forms of communication as technologies often present information through visualisation with translation from written to visual; an example of this being movie making animation where script is translated into a visual message. Unsworth (2002) holds a similar view pointing to the increasing use of images in printed texts ranging from picture story books to newspapers as evidence of a growing prominence of joint construction of meaning through two or more modalities. Computer games, as described by Gee (2003), require use of visual literacies and some print based literacy to achieve success. Arguably, multimodality has always been a part of written text but with increasing advances

in technology what has been ignored in the past, print size, font, paper, is paramount to meaning making in today's multiliterate society. The nature and role of images, text font or typography have undergone change (Unsworth, 2001) and the "non-linear connectivity between different textual elements" (Beavis, 2001, p. 145) such as spatial literacies, are interwoven in the meaning making process. Healy (2004) notes that print technology does not have the capacity to design multimodal texts in such a non-linear way. Thus, being literate today is a complex process that requires understanding of how meaning is created through the relationships between these modalities (Turner & Turbill, 2007) within a range of contexts and influenced by social and cultural practices (Anstey & Bull, 2007).

Some theorists suggest that traditional print based literacy skills are pre-requisites for multimodal literacy (Kellner, 1998) or in the very least are intertwined. Anstey and Bull (2007, 2010) describe five semiotic systems used to convey meaning in multimodal texts: linguistic, visual, auditory, gestural and spatial and emphasise the need for learners to understand the codes and conventions of each semiotic system. Furthermore Healy and Dooley (2002) note that the teaching and learning relationship between the teacher and the child with linear like traditional print texts situates the teacher as the 'expert' and promotes modelled classroom instruction. It is suggested that an understanding of multimedia texts cannot be delivered in the same way because the way in which a multimedia text is read differs to a linear text giving rise to new reading practices. Healy notes (2008) that in the current literacy context the connection between texts and social meaning continues to exist but the book as it is represented in traditional literacy is no longer the singular expression of social meaning, as multimodality has resulted in the morphing of the book into an "atomized constellation of texts, information representations, and dissemination forms" (Healy, 2008, p. 5). Thus, consideration of re-contextualisation of literacy needs to embrace multiliteracies and multimodal approaches to learning and teaching in line with the communication we encounter in everyday life.

Literacy as social practice

Central to arguments for re-contextualisation is the notion of literacy as social practice (Cope & Kalantzis, 2000; Gee, 2003; Kress, 2000; Lankshear & Knobel, 2006; Street, 1984; Turbill & Murray, 2006; Zammit & Downes, 2002). Kress (2006a) argues that public communication; verbal and visual should be considered part of 'English'. A similar view is held by Snyder (2001) who reminds us that being literate must take into account the multimodal systems that are part of the 'communication order' integrating written, oral and audio-visual modes of communication. Further to this view of literacy as social practice are the local and global implications of communication practices. Kress (2006a) cautions that there is a need to re-contextualise literacy in a global context but, local conditions must also be accounted for in this process. This poses challenges as it suggests that 'English' means different things in different places and the right to preserve this notion in any re-contextualisation process is as important as reaching global understandings. In the keynote address at the Future Directions in Literacy: International Conversations Conference in Sydney (2007), Freebody

drew reference to the disappearing Aboriginal languages in Australia, highlighting the need to consider ways in which community and culturally specific language and literacy requires preservation in any re-contextualisation process. Kress (2006a) refers to the need for schools to be able to deal with the global and the local; the global need for uniformity and consistency and the diversity that exists in local variations. What this all means for children today, is that early literacy learning occurs in far more complex textual environments than previous generations (Healy & Dooley, 2002).

2.3.1: The Need for Schools and Pre-schools to Apply Digital Technology to the Literacy Context

New technologies transform literacy (Durrant & Green, 2000; Lankshear et al., 2000 with Green); just as print literacy transformed manuscript literacy. We are in the midst of similar transformations today. Kress (2006a) describes the influence of communication media on remaking notions of reading and writing through multiplicity of modes and moving reading of texts beyond interpretation towards engagement in text. For example, information and communications technologies (ICTs) have given rise to easier ways of communicating to a wide audience and new forms of self-expression such as blogging; a combination of private and public communication in the form of diary discussion board or 'blog', thus creating a blurring of different genres. Merchant (2006) notes that new tools for communications have resulted in new communication needs, particularly for digital writing, and that school curriculum should incorporate new communication practices. These new uses of technology for communication support arguments for an expanded view of literacy embracing literacy as social practice.

In early years settings some theorists describe literacy enriched play as social practice (Beecher & Arthur, 2001; Brooker, 2011; Elliott, 2010). In play settings children are afforded the opportunity to explore social practices and the functions and features of literacy within supportive and meaningful contexts. In fact it is argued that children's engagement in play and in technologies is mutually inclusive (Marsh, 2007). Elliott (2010) argues that technologies are seamlessly interwoven into children's lives and become part of the funds of knowledge that children bring with them to formal education settings. These funds of knowledge include techno knowledge (Beavis, 2002; Turner & Turbill, 2007) and from a socio-cultural perspective must be deeply reflected in early literacy curriculum, particularly in play-based curriculum:

As technology has changed and expanded, play has assumed new guises, forms and contexts, but it essentially retains its fundamental role in development and learning. The roles of digital technologies, from the Tamagotchi of the 1980s to the more recent Wii technologies, have changed the play landscape...To communicate effectively children must move seamlessly between print and other symbolic and digital environments in a range of contexts... (Elliott, 2010, p. 69)

Literacy enriched play as social practice challenges the traditional role of early childhood educators and requires them to help children develop competence in a range of digital and non-digital contexts. In his seminal work Papert (1993) found that teachers were resistant to change:

...despite the many manifestations of a widespread desire for something different, the education establishment, including most of its research community, remains largely committed to the educational philosophy of the late nineteenth and early twentieth centuries, and so far none of those who challenge these hallowed traditions has been able to loosen the hold of the educational establishment on how children are taught. (p. 3)

Papert (1993) challenged the pervasive assumption that a child's educational development is dependent on their ability to read and suggests that whilst the value of print literacies in the educational development of the child is not under dispute, print literacy may not necessarily be at the core of communication and social practice. These views challenged pervasive assumptions about literacy and technology in 1993, yet it would seem that continued arguments around the theme of re-contextualisation have continued to place literacy and technology at the centre of the debate today.

The Need to Move Forward

As the pressure to integrate technology into the curriculum continues to grow it is argued that schools have embarked on a process of domestication of new technologies (Bigum, 2002; Snyder, 2002b). The pervasiveness of screen time although acknowledged in the current societal context has not necessarily found its way into schools. Instead of rethinking education, new technologies were adapted to make them school-like and to fit with curriculum and pedagogy from an earlier age (Durrant, 2001). Technology was part of "business as usual" (Lankshear & Knobel, 2006); computers were used to type stories, PowerPoint to present project information, the internet and software packages to search for information. In short, children were busily involved in activities that would previously be pen, paper and book tasks. For literacy it was the same as it had always been, just more technologised (Snyder, 2008). Contemporary views of literacy imply that learning to read, write and be literate in today's society requires more than adapting print literacies to new learning environments, but rather the learning of new skills within a framework that continues to value traditional literacy skills (Labbo, 2006; Turbill & Murray, 2006; Zammit & Downes, 2002). As noted by Hill (2007), "digital literacies and print-based literacy are not oppositional concepts: both are required for effective functioning in the twenty-first century" (p. 60). In other words, approaches to literacy should recognize the range of literacy practices children need to become engaged citizens and embed these practices within a balanced program (Turbill & Murray, 2006).

Emerging perspectives indicate that in order to move forward in literacy education technology needs to influence literacy aims and pedagogy (Bigum, 2002; Durrant, 2001; Lankshear & Knobel, 2006; Snyder, 2001). By influencing literacy aims and pedagogy it is not suggested that there is a need to further technologise literacy, but rather to consider contiguities between literacy and technology, and map new ground for others to follow. Snyder (2001, 2008) reminds us of the complexity of real literacy practice in which ICT is inescapably a part, arguing that the traditional cultural separation of literacy and technology in schools contributes to the disjointed uptake of technology in literacy. Guidelines for uses of technology described by the British Educational Communications and

Technology Agency (BECTA) and Developmentally Appropriate Technology for Early Childhood (DATEC) by Brooker (2003) emphasise the expectation that ‘technology should be integrated within the classroom and curriculum (p. 253). It would seem that what is needed then, is a path that maps the relationship between literacy and technology; a path that will “support new literacies and simultaneously or alternatively enhance traditional literacy” (Labbo, 2006).

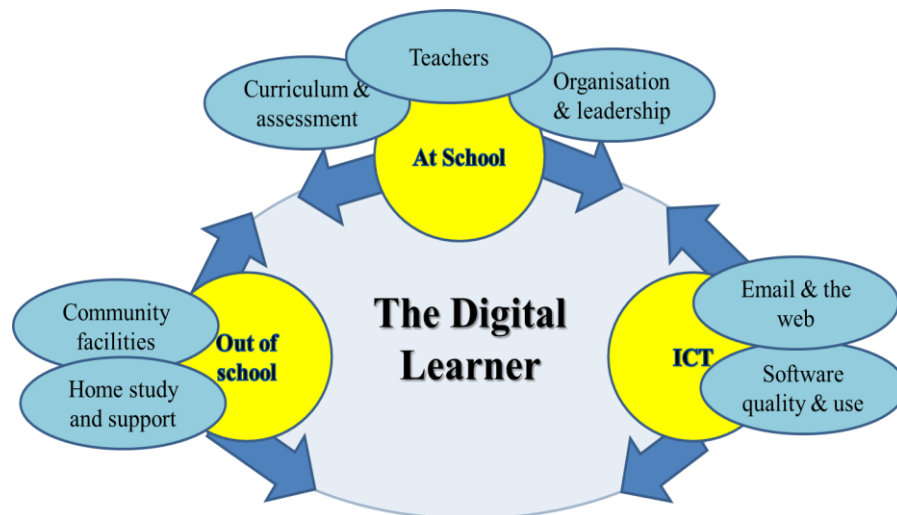
Kalantzis et al. (2005) put forward the proposition that technology will become central to all learning, but caution that the mere use of digitised technologies in learning contexts does not ensure learning. Snyder (2008) reminds us that wide access to technology at home should not rest on any assumption that literacy learning will occur. Learning is due to young children’s differential access to technologies, parental ability to provide appropriate experiences with technology (Siraj-Blatchford & Whitebread, 2003) and the diverse range of ways in which people engage with technology in the community. It is argued that children may engage with technology on a contextual level but there is a need to do more, as children need to develop deep understandings of how the semiotic systems work and analysis of purposes and ethics associated with the creation of, and engagement in using digital texts (Hill, 2007). Technological convergence may offer improved learning for students through the production of more meaningful texts and the connection of social practice inside and outside school (Goodwyn, 2001). According to Snyder (2002a), curriculum and pedagogy surrounding new communication technologies in the literacy program should be approached with caution, as all students should achieve competence in the varied modes of communication, but the challenge is to create pedagogical and curriculum frameworks that are supportive of print and new literacies, and are designed to meet the needs of the present and the future. To understand what this kind of curriculum and pedagogy might look like teachers need new understandings of new literacies and technologies and the interrelatedness of literacy and technology in order for students to experience continuity in their learning experiences (Lankshear & Knobel, 1997a). Undoubtedly the teacher, not the technology makes the difference to student learning not the technology (Andrews, 2004a; Freebody et al., 2008b; McLean, 2009) and yet research on teacher attitudes and beliefs about the integration of technology into the curriculum is limited (Marsh, 2003). Without teacher understanding of the nexus between literacy and technology in these areas a mismatched collage of mediocre experiences and learning outcomes threaten to result from disjointed literacy practices.

Andrews (2004b) provides a model that shows the digital learner as being at the centre of a network of communities (*Figure 2.2*). The model shows the learner immersed in three important communities: in the formal educational setting when teachers mediate access to technology and the assessment of learning; outside of school where a learner operates within a variety of communities (e.g, the family, sporting clubs, libraries) and communities associated with ICT such as email users and software creators. Andrews (2004b) argues that this perspective of the digital learner as being at the centre of a number of communities challenges educators to consider how the interrelatedness of these learning communities may support learning. This suggests that consideration should be given to

“how individual and organisational practices impede or embrace technological innovation” (Freebody, Reinmann, & Tiu, 2008a, p. 5). In formal education settings the research indicates that leadership contributes to an environment where teachers grow through professional learning (Darling-Hammond, 2003). As such, the principal plays a pivotal role in teacher use of technology in the literacy context as approaches to pedagogy supporting the application of technology to the literacy context may be impeded or indeed sustained with leadership support.

FIGURE 2.2

The Digital Learner (Andrews, 2004, p. 62)



2.4 Technology and Literacy: Curriculum and Pedagogical Reform

This section explores what might be needed in realising and utilising the relationship between technology and literacy in the early years. It considers how the literature pertaining to curriculum and pedagogy relates to the present study.

Interpretations of pedagogy vary. Griffith and Kowalski (2010) describe pedagogy as “the knowledge of principles of teaching and learning” (p. 111). However a more focussed description of pedagogy is provided by Comber and Reid (2007) in their claim that “pedagogy is knowledge about how to teach so that children will learn” (p. 45). In short, pedagogy represents the ‘how’ and ‘what’ of teaching so that children will learn. This is the view of pedagogy embraced in this study.

The cultural shift from literature to popular culture and from print culture to visual culture is something that most educators have adapted to as the digital ecology has developed (Green & Bigum, 1993). However, for the children in today’s classrooms the experience has been quite different as they were born into the digital ecology and it is their natural world (Green & Bigum, 1993). For example, Edwards, Henderson and Mirkhil (2001) note that many of today’s children “grow up with an awareness of always being connected”(p. 13) to the internet and of ways in which moving images and mobile digital technologies are deeply embedded in their daily lives. Other studies provide similar findings in relation to children’s experiences with technology prior to, and outside of, formal

education settings (Healy & Dooley, 2002; Marsh, 2005, 2006; Wohlend, 2009; Zevenbergen & Logan, 2008). What this suggests is that children's learning in formal education settings must align more closely with their cultural experiences of technology and literacy. The following section will consider issues surrounding curriculum and pedagogical reform that may be necessary to ensure this occurs.

Curriculum Reform for the 'Knowledge Society'

'Information age', 'new millennium' and 'knowledge society' are some of the terms used to distinguish the world we live in now from the industrial age. But whatever term we use to describe the current digital ecology educational change is certain. Kalantzis, Cope and the Learning by Design Project Group (2005) argue that the "emerging 'knowledge society' requires a radically new approach to learning" (p. 3). In order to engage meaningfully in the digital world current theorists suggest a need for educators to take on pedagogy that embraces electronic media and communications or face the danger of being led in this direction by the corporate world (Edgar & Edgar, 2008; Luke, 2000). What is undisputed in this debate is that knowledge is changing to the extent that what is learnt as fact in schools today may be contested tomorrow (Kalantzis et al., 2003). As the demands of the knowledge society bring about changes in work, civics and personal life, in turn, schools will need to change also. Theorists describe tomorrow's learners as being self-directed, flexible, collaborative and communicative problem solvers (Kalantzis et al., 2003; Lankshear & Knobel, 2006; Lankshear et al., 1997; New London Group, 1996) able to adapt and assimilate new knowledge into existing knowledge as knowledge becomes less containable. Accordingly, Marsh (2004) emphasises that the foundations for this learning should begin in early childhood:

...the need to develop children's skills for societies which will require flexible workers who are able to navigate complex, multimodal textual worlds and manage information from a range of sources- it is clear that building the foundations for this should start as early as possible (p. 15)

Hence, curriculum should be considered as design for the future (Kress, 2000, 2006b) and literacy, through creativity and innovation of design, will be empowering in the shaping of our future. Snyder (2002a, 2008) highlights the need to devise new pedagogical and curriculum frameworks that are inclusive, imaginative, critical and rigorous. The point that needs to be emphasized here is that creating and communicating are an important part of literacy learning and thus children should be encouraged to use imagination in a technology infused literacy curriculum.

Within the current debate about re-contextualising literacy the notion that literacy learning should embrace design and creativity may challenge functional underpinnings. Yet what must be recognised within this current viewpoint is the potential for children to learn in ways "that allow them to participate fully in public, community and economic life" (The New London Group, 2000, p. 9). It is the role of literacy to build connections and offer full involvement in life; in the knowledge society the scope of literacy pedagogy should be broadened to include a "multiplicity of discourses" (The

New London Group, 2000, p. 9) with the aim of contributing to productive economic, social and cultural futures (Kress, 2006b). Innovation in design and creativity are part of this process through immersion in meaningful practices connecting schools with community and making learning 'real', as it moves beyond school discourse (Nakata, 2000). In essence, current theorists characterise learning for the 'knowledge society' as 'transformative learning'. It follows that transformative curriculum and pedagogy must be in place if transformative learning is to occur (McLean, 2007).

Transformative Curriculum

Within a transformative curriculum transformation in learning occurs as engagement in learning enables learners to be 'knowledge producers' rather than 'knowledge consumers' (Kalantzis et al., 2005) through following alternative pathways to reach similar learning destinations (Kalantzis, Cope, & Cloonan, 2010). It follows then that for learning to be effective it will need to be active, inquiry based and collective as communities of learners engage in empowering meaning making. Walsh (2006a, 2010) reports on a series of case studies conducted in Sydney schools that examined children's interactions with multimodal texts. The findings from the study indicated that student motivation and engagement occurred through engagement in collaborative tasks which fostered peer learning. These findings align with views by Bruce and Bishop (2008) who claim that the teaching of new literacies should be fostered in communities of collaboration and inquiry which extend beyond established modes of thinking about literacy teaching. These studies pinpoint possible advantages for literacy learning of collaborative and inquiry based curriculum.

Transformative curriculum has been described as a curriculum that caters for difference amongst learners (Kalantzis et al., 2005) and places value on the ability to be creative problem solvers within a supported learning community (Exley, 2008). It thus provides an interesting parallel to Green and Bigum (1993) who applaud 'engaging of difference' as a means of growth in the digital ecology. Whilst the former refers to a foundation for equity through consciously embracing difference amongst learners, the latter invites educators to 'engage in difference' as we have done in addressing the 'generation gap' so that growth in relationships can occur. What these two perspectives have in common is the absolute belief that learner life world experiences must be part of the learning; internet, multimodal texts, popular music, communications practices are part of the life world experiences of children and must be part of the learning in formal educational settings. Snyder (2008) argues that literacy teaching and learning needs to provide deep connections between contemporary technology and literacy practices in and out of formal education through a critical lens of understanding meanings in wider communication. In other words, the focus on learning needs to move beyond the functional aspects of technology and towards critical understanding of contemporary literacy practices on the cultural and social landscape. Meaningful learning stems from curriculum content that engages learner life world experiences, contributing to growth in relationships and understanding. A contemporary approach to teaching and learning which has found its way into Victorian schools

through the work of Fullen, Hill and Crevola (2006) and which embraces such a view is that of ‘personalised learning’.

Personalised Learning

In preparation for a ‘knowledge society’ a personalised learning approach to education has four main tenets: learners, information and communications technology (ICT), lifelong learning and communities of collaboration (Keamy, Nicholas, Mahar, & Herrick, 2007). Deeply embedded in a socio-cultural perspective of education, personalising education places the child at the centre of learning through developing a curriculum around child interests, needs and learning styles. The approach aims to provide opportunities for child voice and choice, and meaningful assessment for, and from, the children (Keamy et al., 2007). Through maintaining an emphasis on the learner as central, one of the key goals of personalised learning is to improve learning outcomes for all: “personalisation is about the whole child, about building capacity and appetite for learning across society” (Leadbeater, 2005, p. 15). This view concurs with those in the field of early childhood research who maintain that children should have control of learning when using ICT (Siraj-Blatchford & Whitehead, 2003). The second tenet of a personalised approach to learning is ICT. In a personalised learning approach ICT, as a key enabler of learning, allows for diversity, interactivity and flexibility (Keamy et al., 2007). Social learning is fostered in a personalised approach. Through “helping students to share a task and to engage in mentoring and coaching, the new technologies can enhance social skills – contrary to the widely held view that computers trap students into working alone in front of a screen” (Hargreaves, 2005, p. 27). Furthermore, Hargreaves (2005) argues that new technologies represent a gateway to learning “by providing learners with access to learning any place and at any time, learning is no longer trapped in, and confined by, school or teacher” (p. 22).

It would seem that a technology infused approach to learning in the classroom is consistent with personalised learning and is crucial in fostering interactive use of ICT between educators, children, the wider community and beyond the classroom walls. The third tenet of personalised learning is ‘lifelong learning’. ICT, as a key enabler of learning, affords opportunities for change in pedagogy to promote lifelong learning and connectedness (Freebody et al., 2008b) through the provision of flexible learning environments and different pathways for learning.

The final tenet of personalising education, ‘communities of collaboration’, sets out to establish strong relationships between adults and children through the promotion of networks of learning and expertise through the establishment of strong links between home, school community and the broader community and services (Keamy et al., 2007). Further research is needed to explore how a personalised learning approach may influence literacy pedagogy. What is needed then, perhaps in this study, is further insight into how personalised approaches which focus on learner needs, learning in collaborative communities extending beyond the classroom walls into the wider community, and the use of ICT as a key enabler of learning, can foster literacy learning in the early years of education.

2.4.1 The Need for New Ways of Teaching and Learning in the Early Years of Education

Games and Electronic Toys

New ways of teaching and learning are required to prepare children to be literate in a digital world. Edgar and Edgar (2008) argue that children's involvement with communications technology should be active and given guidance by responsible adults. A similar view is advocated by Edwards, et al. (2010) who emphasise that screen time and digital technologies do not need to be passive and opportunities for digital and dramatic play with technology should exist in early childhood settings. Theorists draw on the collaborative nature of many gaming experiences; Wii, Xbox and Nintendo for instance, and the dialogues and communications that occur in many online communications and in the creation of online content, to support their argument for active interactions and learning using new technologies (Downes, Arthur, & Beecher, 2001; Freeman & Somerindyke, 2001; Zevenbergen, 2007).

Dalton and Proctor (2008) argue that further research is needed into how children develop dispositions for 'learning how to learn' in a digital world. They argue that digital learning environments rely on learners making choices and suggest that issues relating to choice and self-regulation in digital environments should form part of this research priority. It follows that new ways of teaching and learning need to engage children in the early years of education through design, production, communication and evaluation of texts. Student engagement should occur in an environment where self-regulation of learning is fostered and appropriate access to ICT is provided with the same rigour and intensity as elsewhere in formal education.

Some researchers argue that young children are more technologically sophisticated today and this is linked to the downsizing of high level technology that is incorporated into children's toys such as micro chipped toys, child friendly laptops and interactive computer games (Elkind, 2007). Elkind (2007) suggests that the ability to use this technology does not necessarily equate to understanding the technology. Furthermore, as children become targets for multimodal marketing, the ability of educators and children in the early years to be able to critically analyse the purposes and use of these texts will become urgent (Arthur, 2001; Hill, 2007). In addition, it can be argued that child engagement in the natural world and a fostering of curiosity to discover 'how things work' has a place alongside using technology in the early years of education as playfulness and technology are not mutually exclusive (Siraj-Blatchford & Whitehead, 2003). The challenge for educators is to ensure that computer games, screen play, electronic toys and other forms of technology do not detract from play; the "inborn disposition for curiosity, imagination and fantasy" (Elkind, 2007, p. ix), and maintain strong literacy links to the natural world.

A study by Brooker and Siraj-Blatchford (2002) explored the ways in which three and four year old children learn from computer use in nursery school and found that children engaged in a range of interactions which had benefits for social, cognitive and linguistic development and learning

across a range of curriculum areas. Another study by Marsh (2006) highlighted the need to integrate technology and literacy in the early years of education in a way that harnesses the natural curiosity of the young learner. The study engaged nursery school children in England in creating animations using webcam technology and movie maker software, with the findings suggesting that “unbridled enthusiasm” (Marsh, 2006, p. 504) for new technologies needs to be reflected in curriculum and assessment frameworks. In the report of the *Digital Beginnings* study Marsh et al. (2005) found that in the 3 to 5 age group “the introduction of popular culture, media and/or new technologies into the communications, language and literacy curriculum has a positive effect on the motivation of children in learning” (p. 76). Similar findings were reported from a study by Walsh (2010) who explored multimodal literacy pedagogy in nine Australian classrooms. Walsh (2010) reported that children’s motivation and engagement seemed to correlate with the social features of digital technologies. In another report on the use of technology in early childhood environments it was found that the immediacy provided by digital photography was useful in fostering cultural competency particularly amongst young children who were visual learners (Meadows & Murphy, 2004). Similar views on the affordances of technology for fostering learning in young children have been presented in other studies demonstrating that appropriate integration of technology into the curriculum can improve student motivation to learn (Freebody et al., 2008b; Hill, Yelland, & Thelning, 2004; Marsh, 2003) and may improve student independence in learning (Freebody et al., 2008b). The findings from these studies support the need for further research in this area to better understand the affordances of digital technology for literacy learning in the early years of formal education.

Play

Comber and Reid (2007) note that through play both in and out of formal education children draw on a range of cultural resources in the literacy domain. Given children’s use of popular media texts, popular culture may be used to promote literacy learning as children use these resources to demonstrate understandings of power, identity, language and critical literacy through play (Beecher & Arthur, 2001; Comber & Reid, 2007; Lysaker, Wheat, & Benson, 2010). In a study of the role of spontaneous play in writing workshops, with young children, reported by Lysaker, Wheat and Benson (2010) it was found that through play children could construct their own personal zone of proximal development (ZPD) by infusing the literacy practice of learning to write with social elements such as emotion and fantasy in play. In this study, findings supported a Vygotskian view of the function of play through the way play was used to mediate the children’s development. The findings place importance on spontaneous play opportunities and further highlighted that new ways of teaching and learning in play based settings require educators to provide access to a range of resources; print and digital, and to allow for the integration of these different modes into dramatic, daily real life and educator planned play experiences.

Current research suggests that access to technology resources is high on the agenda for pedagogical reform. In *The Horizon Report* (Johnson, Levine, Smith, Smythe, & Stone, 2009) the

authors indicate that no matter what the level of education, new approaches require access to flexible technology. The use of the term flexible requires that technology can be seamlessly interwoven into the learning experience and modified or adapted to suit the learning needs in different contexts for different children. In the report by Freebody et al. (2008b), it is noted that digital technology should be used innovatively in a variety of contexts from community to formal education contexts. This is a particularly important consideration for this study as studies in early childhood have found that educator uptake of technology in the classroom may be hindered due to a shortage of resources (Zevenbergen & Logan, 2008). Thus early years educators need to use the technology to which they have access in flexible ways in order to foster literacy learning.

Collaboration

Some research suggests that learning outside formal education happens collaboratively in groups and by using resources accessed through the internet (Johnson et al., 2009). Johnson et al. (2009) point out that in some traditional learning environments this experience is hindered due to inflexible practices such as children working alone at stand-alone computers. Some theorists suggest that multi-age models have a potential to challenge traditional notions of development and can be supportive of developing new literacies. Digital technologies are embedded in everyday life and in the children's social and cultural worlds (Edwards, Henderson, & Mirkhil, 2010). Cambourne (2002) adds to this argument by noting in his exploration of real world examples of learning that the sharing of intellectual knowledge through carrying out jointly accomplished tasks contributes to meaning making. Further, a meta-analysis of studies on the effects of computers on student writing by Goldberg, Russell and Cook (2003) found that the process of writing on computers was largely a social one for students and resulted in children writing, editing and collaborating over longer pieces of work. It follows that children's use of computers and other digital media in education settings should involve collaborative play and supported interactions (Brooker, 2003; Freeman & Somerindyke, 2001). Snyder (2008) holds a similar view in relation to literacy learning whereby she argues that literacy learning is a shared enterprise involving the teacher and the children collaborating to make meaning. In early childhood education Edgar and Edgar (2008) concur with this view but warn it is not widely evident in teaching practice: "cooperative learning will inevitably involve new digital forms of information exchange and creativity, yet most teachers are well behind their students in seeing its potential" (p. 197). This argument puts what educators 'do' with technology at the centre of any debate on new ways of teaching and learning. It suggests that in the early years of education children's use of digital technology in the literacy context should foster collaboration and that this is largely not what is happening in early learning environments. As the teacher controls how children use and interact with digital technology in the early years setting, collaborative approaches to using technology in the classroom should be further explored in a pedagogical approach.

2.5: Best Practice in Literacy and Technology Teaching

This section explores recommendations and models for the application of technology to the literacy context which have informed this study.

Some theorists believe that new ways of teaching will require educators to be up to date with children's current technology and literacy practices in and out of school (Knobel, 2006) as it is argued that learning will emerge from digital media to which children are exposed in their everyday lives (Downes, Arthur et al., 2001). Such approaches would require educators to focus on children's strengths rather than weaknesses in technological use. Approaches encouraging children's use of technological 'funds of knowledge' are credit focussed and challenge prevailing views for the use of 'developmentally appropriate resources' (Knobel, 2006). An Australian study by Downes, Arthur and Beecher (2001) explored the use of digital resources in early childhood settings. From this study three key elements of effective practice were identified: quality resources, effective learning environments and appropriate teacher interactions. The study described quality resources in terms of flexibility and relevance to early childhood settings and highlighted the need for learning environments to be designed in a way that combines digital and traditional resources. It was suggested that children should be provided with opportunities to actively investigate using digital resources in a variety of different ways appropriate to their needs. It would seem that through an emphasis on 'process' and 'content' deep learning beyond novelty can occur (Downes, Arthur et al., 2001; McLean, 2007).

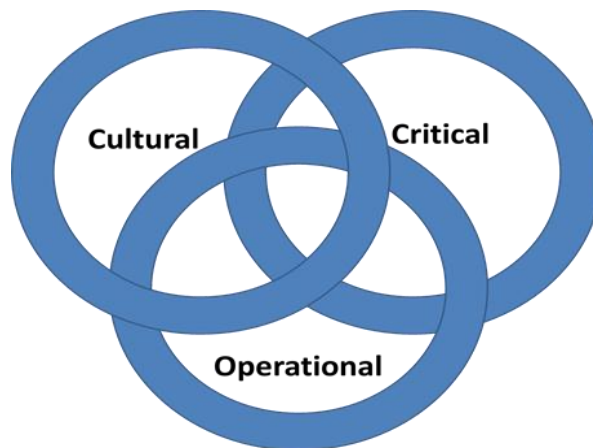
Similar views can be identified in the implementation of place-based literacy models where an expanded view of literacy incorporates information and communications technology practices into literacy education as part of a community focussed curriculum. Comber, Nixon and Reid (2007) point out that "the combined affordances of multimodality and place-based education allow teachers and their students to explore new possibilities for knowledge-building, action and communication" (p.13). Critical literacy studies are considered to be imperative within frameworks incorporating an expanded view of literacy as students read, produce, and critique communications beyond words. In terms of student engagement place-based literacy approaches enable students to "produce and engage in communications that matter to them" (Comber, Reid et al., 2007, p. 13). As students are critically involved in meaning making through a variety of modalities; visual, written, spoken and other modes (Martello, 2007), an opportunity to engage cognitively exists. Within the model described by Comber et al. (2007), learning occurs in the social situations relevant to the students, school and community, enabling opportunity for students to engage at the affective level through embracing their interests and need. Finally, the design and creation of texts with real purpose beyond the school gates enables engagement at the operative level. This vision of literacy pedagogy has relevance to this study as it aims to encapsulate a community of learners in an autonomous and symbiotic relationship through embracing local diversity and global connectedness, a necessary aim for fully literate citizens (Comber et al., 2007; Kellner, 2002; New London Group, 1996).

Another model with relevance to this study is the three dimensional model of literacy-technology learning (*Figure 2.3*) (Durrant & Green, 2000). New pedagogies should be contextual and engage the life-world of the learning community (Kellner, 2002) by providing authentic context and purpose for literacy learning. The model was designed for thinking about subject specific literacies but has been more recently used for conceptualising and planning for literacy (Beavis, 2003). The model demonstrates an emphasis on operational, cultural and critical practice, and the contextualisation of literacy-technology learning in an integrated learning environment. A significant priority of this model is the need to ensure an ‘authentic’ context for learning. Authenticity is achieved through planning activities that connect across a cultural, critical and operational context. The New London Group (1996) refers to authentic context and purpose as situated learning, a view that is also part of the place-based educational practice described by Comber, Reid et al. (2007). These theorists argue that all literacy learning should begin with an “authentic context of situated social practice” (Durrant & Green, 2000, p. 97) as students actively engage in working with ‘real’ and ‘relevant’ texts, targeting student need and interest. Gee (2010) draws on research about children’s interactions with video games to demonstrate the importance of situated practice. Gee (2010) describes the way in which children playing video games are immersed in meaning making practices that enable children to learn language through engagement in the video game. Gee (2010) stresses that the lesson for educators here is that meaning should be situated within experience that is “ultimately shared, collaborative, social and cultural” (p. 189). This view is supported in the work of Herrington, Reeves and Oliver (2010) who highlight that an authentic e-learning task is perceived as real and “involves cooperative relations and shared consequences”(p. 45).

A similar view of authentic learning is held by Edgar and Edgar (2008) who emphasise that “the most important new narrative today is the story of the planet in which we are bound in common destiny” (p. 221) and the narrative in which ethics needs to be explicitly taught. The common thread between these views of situated practice is the link to constructivist learning. As a condition of constructivist learning, situated learning occurs when understanding develops through problem solving in a context that requires situated use, drawing on children’s skills and understandings (Brown, Collins, & Duguid, 1989). New approaches to pedagogy, it could be argued, should embrace situated practice and authenticity as it pertains to the 21st century.

FIGURE 2.3

3D Model of Literacy (Durrant & Green, 2000)



In contemporary society young children require knowledge of the moving image and content necessary for a multimodal world (Freeman & Somerindyke, 2001; Hill, 2004). Elkind (2007) believes that educators should look to early childhood for models of education best suited to the technological world. Elkind (2007) points out that early childhood education integrates play, love and work with children's needs and interests central to learning. For Edgar and Edgar (2008) the early childhood model's potential in the technological world has to do with the fact that "kids love to learn, kids love to play" (p. 216). These underpinnings are important for this study. It is highly possible that early years educators acknowledge that it is time that play, which encapsulates computer game playing and digital technological play, and learning come together with literacy learning in the early years of education.

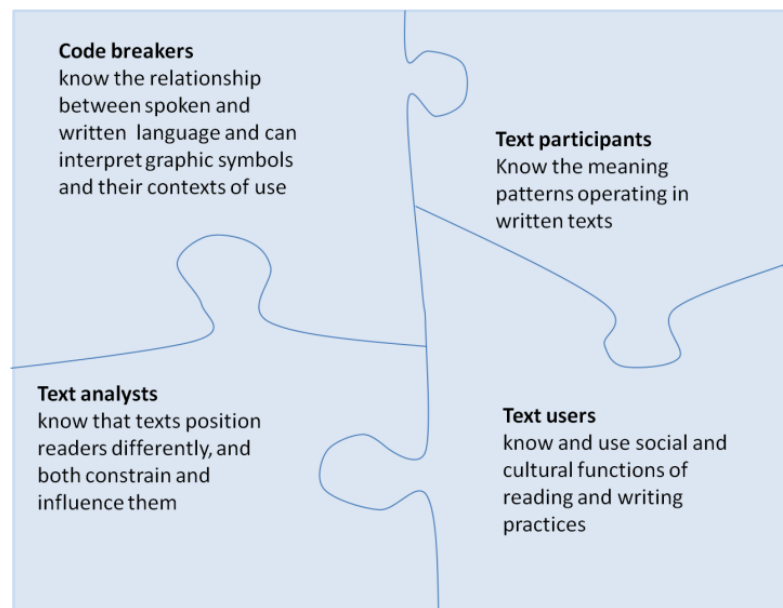
It is argued that approaches to new pedagogy demand that educators have a repertoire of flexible teaching and learning strategies to meet children's learning needs in new societies and cultures (Gannon & Sawyer, 2007; Hill et al., 2002; Luke & Freebody, 1999). Luke and Freebody (1999) note "differing teaching approaches work differentially with different communities of students" (p. 8). They devised a model for framing instruction across a range of textual practices. This model, the Four Resources Model (see *Figure 2.4*) places emphasis on the broad repertoire of textual practices required for the 21st century (Luke & Freebody, 1999) and is useful for framing an instructional program in the early years of education (Hill et al., 2002) which is centred around a multiliteracies curriculum (Anstey & Bull, 2007). A further identified strength of the model is in the potential for teachers to be responsive to the needs of children and provide a balanced program (Gannon & Sawyer, 2007).

The model describes a family of practices that occur in and out of formal education and categorises these practices into 4 resources; code breakers, text participants, text analysts and text users (see *Figure 2.4*). The four resources model can be used to inform the range of practices necessary to ensure textual practices required for changing societies are embedded in the literacy

program (Freebody, 2004; Luke & Freebody, 1999). Luke and Freebody (1999) describe the model as three dimensional in the way in which it addresses breadth and depth in its design; breadth of repertoire of literate practice by an individual or community, and depth of control of literate practice by an individual or community and, the extent to which there is transformation. Luke and Freebody (1999) note that the way in which the repertoires intertwine in the orchestration of learning varies for individuals and communities, however each is necessary to be literate in a technologically changing world.

FIGURE 2.4

The Four Resources Model (Freebody, 2004, p. 1)



Some theorists look to the contribution of early childhood research to understand the processes and competence required to engage with a range of technology resources. In an ethnographic study of children's literacy play in early years classrooms, Wohlend's (2009) findings supported the view that in many new literacies, communication is through images and actions more so than print. Hill (2010) points to early childhood research to understand the movement from non-print representational practices to print literacy practices, and the implications for pedagogical approaches which embrace communicative practices with technology. Hill (2010) reports on a collaborative teacher-researcher project that explored 4-8 year old children's work with, and understanding of, new literacy practices at home and at school. Teachers used learning stories (Carr, 2001) to document the new literacy practices of children at home and at school. The study found that young children expressed their ideas and demonstrated comprehension using a range of media, thus supporting calls for a broader view of literacy that embraces the communication practices being used in contemporary society (Hill et al., 2004). This knowledge was then used to develop a literacy framework for mapping multiliteracies based on the four resources model (Freebody, 2004) and the Durrant and Green (2000) frameworks described previously. The model describes multiliterate practices (*Figure 2.5*) in a similar

way to the four families of practices described in the four resources model. The *functional user* dimension refers to technical knowledge, the *meaning making* dimension to the ways in which meaning is made from multimodal text types and technologies, the critical analyser to the critical analysis of texts and choice of tools and technologies, and the transformer role to applying new knowledge to new learning situations (Hill, 2010). The multiliteracies map that emerged from the *Children of the New Millennium* project (Hill et al., 2004) provides a tool for planning and analysis of children’s learning with multiliteracies. It would seem from findings such as these that new approaches to teaching and learning challenge educators to re-consider their role and suggest models of professional learning that enable educators to explore their own literacy practices using digital technology and new literacies.

FIGURE 2.5
The Multiliteracies Map (Hill, 2010, p. 323)

<u>Functional user</u> Locating, code-breaking, using signs and icons Selecting and operating equipment Movement between mediums: cameras, videos, computers	<u>Meaning maker</u> Understanding multimodal meanings Purpose of text and text form Connecting to prior knowledge
<u>Critical Analyser</u> Discourse analysis Equity Power and position Appropriate software / hardware	<u>Transformer</u> Using skills and knowledge in new ways Designing texts Producing new texts

The Role of the Teacher

New pedagogy for literacy needs to take into consideration the role of the teacher (Comber & Reid, 2006; Healy, 2008). Labbo and Reinking (2003) claim that educators influence the way in which young children interact with, and use, technologies for literacy learning in the classroom. Progressive views embrace the notion of early years educators teaching and learning with technology alongside the children as part of a community of learners. This view removes the teacher as the knowledge authority replacing this view with the teacher working in a far more autonomous environment as facilitator and improviser rather than expert (Nixon, 2001). In play based settings the teacher role demands high levels of expertise as the teacher scaffolds, supports, co-constructs, demonstrates, reflects on and extends children’s learning through play (Beecher & Arthur, 2001; Hedges, 2000). It is argued that in play environments educators need to be deeply attuned to what is happening and to join in and be a part of the play experience, at times learning alongside the children (Hedges, 2010; Siraj-Blatchford, 2009). Brooker (2010) further argues that for children to learn in “all the cultural contexts they experience” (p. 52) early years educators must “make connections between

the ways they participate in each” (p. 52). A similar view can be applied to school settings. Comber, Reid et al. (2007) describe the role of the teacher in an expanded view of literacy as “guide, co-learner, broker of community resources and learning possibilities” (p.14). In a study reported by Hill (2010) children became experts with technology and assisted other children with the technology in the classroom, suggesting that the teacher role was more aligned with the views of Comber et al. (2007) than the traditional role of purveyor of knowledge. It would seem that the pervasive view of the teacher as transmitter of knowledge needs to change for meaningful learning to occur. The view of the early years educator as working in an autonomous environment as facilitator is an important role to foster in this study to seek understanding of teachers’ experiences of the relationship between technology and literacy in the early years of education.

Comber (2006), in her work on pedagogy, identifies five kinds of work associated with pedagogy that make a positive difference to children” (p. 61). These different kinds of work are described as interpretive, pedagogical, discursive, relational and institutional. Comber (2006) argues that educators who make a difference to children’s literacy learning listen to, and observe, children closely (interpretive work), have strong knowledge and “repertoires of theoretically informed practices” (p. 62) (Pedagogical work), use language carefully, consistently and appropriately in the classroom (discursive work), have a genuine respect for and high expectations of all children (relational work) and provide the best possible access to resources through maintaining established routines and practices (institutional work).

Anstey and Bull’s (2007) view of pedagogy relates specifically to a curriculum with a focus on multiliteracies. Anstey and Bull identify a set of characteristics embedded in dynamic pedagogy. They suggest that dynamic pedagogy is functional and goal directed, relevant to the learners, develops deep literacy learning and understanding, uses explicit pedagogy, involves learners in monitoring their own learning, acknowledges individual literacy identities in relation to their community, incorporates a diverse range of learning opportunities and uses appropriate resources. Like Comber’s (2006) ‘pedagogy as work’, ‘dynamic pedagogy’ highlights relationships, teacher knowledge, expectations and resources as paramount to learning. In a study by Loudon et al. (2005a) investigating effective literacy teaching practices in the early years of education key findings resonated with the views on pedagogy described above. Findings supported the view that explicit teaching, clear explanations, scaffolding of learning and guided practice were important literacy teaching practices and noted that teacher knowledge contributed to the effectiveness of the literacy teaching practices. Teacher knowledge it would seem is a key consideration for new ways of teaching and learning in the early years of education and therefore needs to be considered in this study to inform pedagogical practice and for professional learning.

Recent Reforms to Literacy Education: The Victorian Context for Literacy Education

This section provides an overview of reforms to literacy education in the Victorian context and the implications these have had for the technology and literacy in the early years and subsequent implications for this study.

Luke and Luke (2001) suggest that emphasis on assessing print literacy practices is misplaced. Whilst Green and Bigum (1993) refer to students in the digital ecology as ‘aliens in the classroom’, Luke and Luke (2001) refer to students as being “alienated student bodies” (p. 96). What is implied is an educational system that is unable to come to terms with multiliteracies and the multimodality of learning.

In 2008, the Australian Government announced a reform agenda aimed at providing universal access to early childhood education. The National Early Years Learning Framework was part of the Council of Australian Government’s (COAG) reform agenda for a national quality framework and national quality standard for early childhood education and care and was implemented in 2009. Although a key purpose of the national framework (Department of Education Employment and Workplace Relations for the Council of Australian Governments, 2009) is to “extend and enrich children’s learning from birth to five years” (Department of Education, Employment and Workplace Relations for the Council of Australian Governments, 2009, p.5) an emphasis on language and literacy learning through play is embedded throughout the document. In Victoria, after a lengthy consultation process, the Victorian Early Years Learning and Development Framework (VEYLDF); a document spanning birth to eight years, and entwining Level 1 and 2 of the Victorian Essential Learning Standards (VELS) was developed (Department of Education and Early Childhood Development [DEECD], 2009). The national early years learning framework was then used to inform the development of the Victorian framework.

The Victorian Early Years Learning and Development Framework (VEYLDF) (DEECD, 2009) places emphasis on holistic child development and an integrated approach to teaching and learning. Effort has been made to acknowledge socio-cultural influences on learning and the benefits of reflective practice for educators. The framework identifies five learning outcomes and VELS English is embedded in Learning Outcome 5: Children are effective communicators. The rhetoric of the documentation acknowledges some expanded and holistic views of literacy and further highlights the need for educator practices to reflect expanded and holistic views of literacy in practice.

On a national level the development of a national curriculum in Australia continues to evolve. A national testing regime (NAPLAN) has replaced state based testing and a national *My School* website has been launched providing public access to the national testing results of schools in the country. The emphasis on early years educator accountability for teaching print based literacy skills as a priority is evident in the standardised testing procedures associated with NAPLAN and the information published on the *My Schools* website despite the use of technological forms. Edgar and

Edgar (2008) warn that a national curriculum agenda driven by economic training needs is wrong for learning and does not form the basis of ensuring every citizen enjoys a meaningful and purposeful life:

...we cannot accept a national curriculum based around economic training needs. Nor can we revert to an old-fashioned approach to testing, assessing standards of performance, at fixed time in a child's life. That never worked and it won't in the new age of technological learning" (p. 198)

Literacy education reforms extend beyond early learning frameworks. Of further concern is the renewed focus on early intervention and literacy in early childhood in Australian Federal and Victorian State Government documents as a response to the perceived need to improve print literacy standards. The Committee for the National Inquiry into the Teaching of Literacy (2005) placed emphasis on the importance of prior-to-school years for early literacy experiences with recommendations for intervention into parenting through "programs, guides and workshops provided for parents and carers to support their children's literacy development" (p. 40). In Victoria, 2007 signified the merging of functions from the Office for Children with Department of Education to form the Department of Education and Early Childhood Development (DEECD). Whilst there may be many positive benefits to this merger, it is interesting to note that some researchers align breakdown of division between childcare and early childhood as part of a trend towards formalisation of literacy education through to infancy (Luke & Luke, 2001). Key identifiers include; specialised literacy programs and decreased class sizes in the early years of education, extra funding to preschool and day care facilities, merging of childcare and early childhood education, campaigns aimed at improving early literacy experiences in the home and a wealth of resources for expenditure on early literacy (Luke & Luke, 2001). In Victoria, parallels to these key identifiers can be recognised. Over the past ten years Victorian primary schools have implemented policy to keep class sizes in Preparatory to Year 2 classrooms at, or below, 21, implementation of specialized early literacy programs such as *Reading Recovery* (Clay, 1993b), implementation of primary school homework policies and the explosion of software packages aimed at improving print-based literacy skills. There is no argument that these key identifiers may represent positive movement in early childhood education, however collectively the trend seems to be a concentrated push towards print and paper based literacy in early childhood without addressing social, cultural and critical perspectives that pertain strongly to the multimodality of learning in the current digital ecology.

Learning for all children should be about providing engaging literacy experiences that have purpose and relevance beyond school literacy (Comber & Reid, 2006; Gee, 1993). The following section explores some of the barriers to curriculum and pedagogical reform that may have inhibited change.

2.6 Barriers to Curriculum and Pedagogical Reform

Current theorists express concern that school learning and the learning that occurs beyond the school gates are at odds, as school learning relates to school practices and the learning that occurs in

the real world is directly tied to social practice (Lankshear & Knobel, 2006; Unsworth, 2002). It would seem that any change to current practice should at least begin with early years educators building on the technology and literacy home practices of children in the early years of formal education (Turner & Turbill, 2007). It would seem that the preoccupation of the education system remains to maintain longstanding perceptions of teaching and learning through familiar language practice such as narratives, recounts and retellings (Lankshear & Knobel, 2006), and that the slow uptake of technology by educators is driven by these longstanding perceptions and a view that technology is the antithesis of good practice in early years settings (Downes, Arthur et al., 2001). Findings from a study by Edwards (2005) suggested three reasons why early childhood educators use computers in the classroom that were not related to pedagogy. The study involved twelve early childhood educators from kindergarten and early learning centres in Victoria. It found that teachers' focuses for using computers in early childhood were predominantly outside the curriculum with reasons given being for skill development, as an extra experience or in response to external imposition. Furthermore, the study found that kindergarten teachers often did not consider computers could provide opportunities for social experiences and active learning. In a different study, Hill (2010) reports findings which indicate that young children in Australia, aged four to eight, accessed and used technology in ways that exceeded teacher expectations. These results suggest therefore there is an urgent need for research to guide teachers in their practice if perceptions are to change (Dalton & Proctor, 2008).

Some studies have looked at how educator literacy beliefs are played out in the classroom. An ethnographic study by Turbill (2001) focussed upon "*why teachers in early literacy find it difficult to implement technology in their literacy curriculum*" (p. 258). During this study Turbill took on the role of participant-observer. The findings suggested that early years educators need to expand their views of reading to embrace new literacy practices beyond reading paper-based books. This finding is supported by Comber (2001) who suggests that a view of literacy as reading and writing is limiting and further argues that practices children engage in at school should have significance beyond school.

In an Australian study reported by Arthur (2001a) it was found that teacher attitudes and practices that do not value the technology and literacy practices that children bring with them to formal education settings marginalise young children situated in low socio-economic areas. The study found that this marginalisation inadvertently occurs because the predominant practices these children engage in include television, videos, computers and magazines, and opportunity to extend on these funds of knowledge for literacy learning are not met (Arthur, 2001). This knowledge that children bring with them to learning is described by Labbo and Ryan (2010) as "e-funds of knowledge" (p. 101) and they argue that the access to communication tools that are at home and in the workplace provide affordances to make connections between home and school that have never been experienced before.

In a large scale study in England conducted by Marsh, Brooks, Hughes, Ritchie, Roberts and Wright (2005) parents and carers were interviewed about children's birth through to six years use of

popular culture, media and new technologies in the home. The findings indicated that children are immersed in new literacy practices at home and that parents and carers scaffold children's learning with media, popular culture and technology in the home. As part of this study, early years educators were also interviewed. The findings from these interviews indicated that whilst educators generally held positive views about the role of media, popular culture and technology in the lives of young children, there was concern about time spent engaging in these activities. Furthermore, educators interviewed for this study identified a need for professional development "in the use of ICT, media and popular culture to promote learning in the foundation stage" (p. 76) as there appeared to be a mismatch in educator belief about the value of these activities and the use of them in early years learning environments. In an Australian study by Hill et al. (2004), teacher-researchers visited their students' homes and found that children's access to, and use of, technology far exceeded access and use in the classroom. These findings further support the argument for building on the knowledge children bring with them to formal education.

Fleer (2004) argues that approaches highlighting technical skills undermine the social embeddedness of technologies and serve to perpetuate narrow views of technology and literacy. As new technologies are integrated within a centralized view of expertise it is argued that their use is tied to school learning, perpetuating separation of discourses for school learning and those for life. Reinking and Labbo (2004) suggest that some reluctance by educators to embrace technology may be tied to the lack of convincing research that conceptualises literacy in the digital world, and in turn the threat that technology poses to print-based literacies. Whatever the cause, it seems that classrooms where the relationship between literacy and technology demonstrates a movement towards re-contextualisation are difficult to find, particularly in the early years of education (Lankshear & Knobel, 2003, 2006; Turbill & Murray, 2006).

Zammit and Downes (2002) argue that the responsibility for learning through literacies lies with all educators – a view supported by Comber (2001) who proposes that children need the best literacies to learn no matter what their age or level of education. In a re-contextualised view of literacy, technology is entwined in the process of becoming literate. Cambourne and Turbill (2007) remind us that a focus on multiliteracies requires children to be able to read and write print text and e-texts, which is a far more complex process. However, teaching to an outcomes framework based solely on reading, writing, listening and speaking will not meet the needs of the 'knowledge society'. In essence, children's experiences with a range of different texts are essential for developing understanding of other texts in the shifting landscape of the 21st century where communication occurs through a variety of inter-related modes (Bearne, 2009). According to Reinking and Labbo (2004), the way we read and write may be fundamentally altered through technology, and the experiences of emergent literate children may change through technology. However, current research in Australia suggests that little change towards using technology in new ways has occurred beyond embedding of technology into the existing curriculum (Turbill & Murray, 2006; Turner & Turbill, 2007).

The prevailing paradigm in the early years of education continues to have a functional literacy - prescriptive technology nexus whereby literacy is seen as a set of skills to be mastered and ICT the tool for mastering the skills (Turbill & Murray, 2006; Turner & Turbill, 2007). One of the key reasons for teacher reluctance to embrace technology beyond a 'tool' in the early years of education appears to be tied to the notion of accountability. VELS in Victoria has been described as 'innovative' in response to curriculum reform; disciplinary and interdisciplinary strands provide a fluid approach to thinking about curriculum. However with the introduction of a national testing regime in the form of NAPLAN and results feeding into the construction of national benchmarks and published on the *My Schools* website, it is not difficult to predict where the teaching and learning emphasis in the early years of education remains. As early years educators are accountable for getting students underway in literacy development, it follows that print-based literacy may remain the driving focus of literacy curriculum as long as assessable paper-based literacy tasks continue to be used as key measures of literacy success.

Turbill and Murray (2006) argue that the slow uptake is partly due to prevalent teaching methods used to teach literacy in the early years of education. In particular, they argue that teaching methods first introduced through Reading Recovery have become entrenched in teaching practices for reading and writing in the early years. The use of running records, levelled text, explicit phonics teaching and systematic instruction are methods highlighting paper-based views of literacy and are strongly entrenched in the literacy programs in the early years of education. However, through instructional transformation theorists suggest that new literacies offer opportunities to engage children in learning of and beyond print literacy; "literacy used in digital environments subsumes abilities to read and write printed text, but concomitantly diverges considerably from its beginnings in print" (Labbo, 2006, p. 204). Viewed in this way it would seem that digital environments provide opportunity to add relevance, cultural alignment, depth and richness to learning in the early years of education, but for the best part technology and digital environments are not perceived in this way in schools. One reason that this may be the case in early years classrooms was identified in the study by Turbill (2003). Findings suggested that early years educators needed more time, technical support, appropriate software and adult helpers in the classroom to guide children's learning if educators are to embrace technology. Turbill (2003) suggests that these issues need addressing for effective integration of technology to occur.

Some theorists describe much of the use of technology in the early years of education as lacking in transformative instruction (Downes, Fluck et al., 2001; Labbo, 2006; Lankshear & Knobel, 2003; Reinking et al., 2004; Turbill & Murray, 2006). Research suggests that technology has been predominantly used to support the development of paper-based literacy skills in the form of 'skill and drill', alphabet decoding and 'busy' work (Lankshear & Knobel, 2003; Merchant, 2008; Reinking et al., 2004; Turbill & Murray, 2006). In pre-school and early childhood settings some theorists insist that technologies have not been embraced by educators beyond documentation (Downes, Arthur, et al.,

2001). A key reason for this lack of uptake in early childhood settings is cited as being a lack of regard by early childhood educators for the use of digital technologies as necessary or appropriate (Brooker, 2003; Downes, Arthur, et al., 2001). It is argued that to realise the “transformative potential of new technologies” (Turbill & Murray, 2006, p. 99) change in pedagogy and curriculum needs to occur. One reason the uptake of technology by educators is slow, and to date not transformative, is a low level of teacher understanding of digital literacies (Healy & Dooley, 2002; Turner & Turbill, 2007; Wohlend, 2009). It is argued that teachers need support to develop competence with, and understanding of, technology if change is to be seen in the classroom (Edwards, 2005; Zevenbergen & Lerman, 2006). Curriculum change requires innovative use of technology interwoven with a view of literacy that encompasses both old and new literacies. Pedagogical change requires teacher understanding of new literacies and technology and the use of models for teaching and learning situating literacy as social practice. This change needs to extend beyond individual classroom walls as resistance to change occurs through organisational and limiting educational administration practices at whole school and government levels of authority (Snyder, 1996, 2002b; Turbill, 2001).

The next section explores models and approaches to pedagogy for working with teachers that have informed the study.

2.7 Pedagogical Considerations for Working with Early Years Educators: Teacher Professional Learning

Teachers’ resistance to change associated with using digital technology in literacy practice is usually linked to educator experience with technology. Educators need to be competent users of new digital technologies before instructional transformation can occur (Labbo, 2006; Plowman, Stephen, & McPake, 2008; Turbill, 2003; Wohlend, 2009). A reason that may account for the lack of widespread educator competence with technology may be that educators in the early years believe they lack the time to learn how to use technology in ways that will transform learning (Turbill, 2001, 2003). Whilst this is an important consideration for those planning professional learning, large blocks of time devoted to developing technological competence alone, will not bring about pedagogical change (McNamara, McLean, & Jones, 2006). Professional learning for educators needs to make more meaningful use of educator time. Lankshear et al. (2000) claim “good practice involves a combination of two qualities: a reflective process, in which teachers subject their pedagogy to theoretically informed scrutiny; and a grounded familiarity with technology” (p. 121). It follows that effective professional learning will embrace these qualities to make the best of teacher time. In a report by Freebody et al. (2008a) on alignment of perceptions about the uses of ICT in Australian and New Zealand schools, it is suggested that teachers need to adapt and create instructional practices that are innovative. For educators the message is clear:

...teachers need to work as innovators who design and create new pedagogical practices, as researchers who inquire into and assess their innovations, and as

knowledge builders who contribute to accumulating the knowledge of their professional community. (Freebody et al., 2008, p. 11)

The message is that ways of delivering professional learning to educators needs to change (Lankshear et al., 2000) to enable educators who perceive themselves as time-poor to develop competence and confidence in their application of technology to the literacy context.

Edwards (2009) argues that, in early childhood education, contemporary approaches to professional learning have been important for assisting teachers to understand and use sociocultural theory in practice. Edwards (2005) notes that “to be effective, professional learning aimed at supporting teachers in their use of sociocultural theory has to begin with their existing beliefs and practical understandings of the teaching and learning process” (p. 92). Thus, in order to build on teachers’ existing knowledge bases it follows that a sociocultural perspective should acknowledge the learning needs and interests that present when beginning with teachers’ existing beliefs and practical understandings. Given that arguments in favour of re-contextualising literacy are inherently shaped by social and cultural communication practices, both locally and globally, a sociocultural perspective for professional learning is an important consideration for this study.

Sociocultural approaches to professional learning consider the social and cultural context of the learning environment, taking into consideration the needs of the learner and community in which the learner is a part. Labbo (2006) refers to two conditions for professional learning in technology as described by Coiro (2005): teacher professional learning needs to be directed at teacher learning needs; and teacher professional learning should be carried out within a whole school learning community. These views are supported by others who suggest that effective teacher professional learning engages educators in learning at point of need, involves active reflection and provides opportunity for support, feedback and practice in classrooms (Ingvarson, Meiers, & Beavis, 2005; McLean, 2007; McNamara, et al., 2006; Parliament of Victoria Education and Training Committee, 2009). In particular, Locke and Andrews (2004) emphasise a need for educators to be given opportunity to reflect on, and evaluate their application of technology to the literacy context to build on understanding and improve application. Cambourne and Turbill (2007) further extend this view emphasising an obligation on the part of all educators to be critically reflective: “we need to reassure teachers that they can no longer simply be doers; they must be thinkers and researchers in their classrooms and schools” (p. 24). The expectation that educators will take on this active role in their learning requires models for professional learning that are quite different to the models of the past.

The nexus between theoretical knowledge and practice is also an important consideration for professional learning. An understanding of contemporary “theoretical and pedagogical discourses” (Marsh, 2003, p. 122) informed by scholarly research in the field of early childhood literacy education, is necessary to ensure that educators are prepared to meet the needs of young children in their classrooms (Kalantzis et al., 2010). In addition, professional learning opportunities should allow for the interrogation of personal beliefs of literacy learning and the accommodation of new beliefs and

change. This perspective acknowledges that educators bring their own expertise and local knowledge to professional learning (Durrant & Green, 2000) and that any change depends on teachers' willingness to engage with new knowledge and assimilate the bits of knowledge that fit comfortably with their own beliefs and practice and reject the rest (Snyder, 2008). The view that early years educators need to confront and make judgements about their own literacy views and beliefs is seen as one way of improving educator uptake (Durrant & Green, 2000; Freebody et al., 2008a; Martello, 2007) through the opportunities it provides to accommodate new learning with practice.

Cochran-Smith and Lyttle (1990) claim that teachers who engage in teacher research through self-directed inquiry can develop deep understanding of pedagogy and transform their practice. This view is supported by Fleet and Patterson (2009) who further add that "systematic engagement in inquiry over time" (p. 21) contributes to effective professional growth. It is argued that opportunity for educators in the early years to be critically literate is essential if children are to become critically literate themselves (Cambourne & Turbill, 2007). Focus on reflective practice in teacher professional learning, it is argued, is one way of supporting this development (Cambourne & Turbill, 2007). Previous models of professional learning for ICT have more commonly been of the workshop type, involving a day or several days' attendance at workshops and the delivery of packages of information that educators took away with them. Teachers as mediators of technology in the classroom control access to, and the way in which, technology is used (Andrews, 2004b). It follows that for pedagogical change to occur professional learning needs to allow opportunity for educators to recognise their own beliefs and attitudes about learning and how these influence their use and student use of technology in the classroom (Andrews, 2003, 2004a, 2004b). When viewed in this way the teacher can be supported in the development of new understandings (McLean, 2007).

One method of engaging educators' in inquiry is through narrative. Fleet and Patterson (2009) describe the effective use of narrative accounts, supported by facilitators, both conceptually and methodologically to understand and provoke adult thinking. They suggest that professional learning occurs as educators use storytelling to reflect on their practices and develop richer narratives. Fleet and Patterson (2009) highlight 5 enabling principles for engaging in inquiry:

- Building on learner strengths;
- Engaging in relevant situationally-based content;
- Enabling peer support;
- Avoiding confrontation, but challenging counterproductive behaviours; and,
- Encouraging participation through a range of supportive strategies. (Fleet & Patterson, 2009, p. 14)

Fleet and Patterson (2009) further emphasise the changing role of leadership in professional learning through inquiry where leading people means more than transmitting knowledge. They suggest that professional learning through narrative should engage educators in collaboration and in participatory

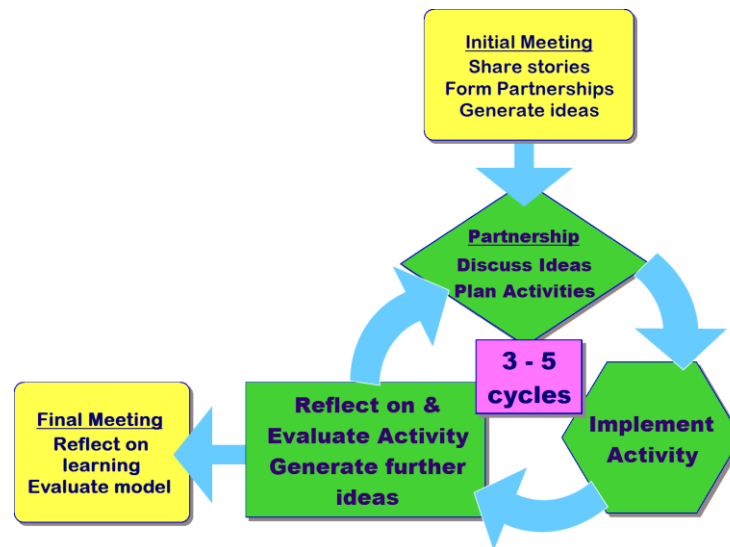
learning. They further argue that in valuing the lived experience, leaders of professional learning must be facilitators, knowledge-sharers and people-supporters throughout cycles of inquiry.

One approach to professional learning with technology that attempted to embrace a cyclic approach to reflective practice was the *Victorian Partnerships in Information and Communications Technology* (PICTL) project (McNamara, et al., 2006). In this project an action-reflection model for professional learning, adapted from Howard and Walsh (2005) was implemented. Using the model to guide the learning process, teachers participated in on-going reflective professional learning cycles (see *Figure 2.6*). Central to a narrative approach is the notion of cycle. Fleet and Patterson (2009) describe a cycle of investigation supported by facilitators, using a narrative approach, as having the potential to foreground “quality issues present in professional practice, and then to develop skills in addressing those concerns” (p. 15). The notion of story is acknowledged as rich in the lives of those who work in social settings such as education (Chase, 2005) and thus a relevant approach to professional learning to consider for this study.

The PICTL model encouraged sustainable professional learning as participants were encouraged to identify a learning need and build on individual learning in a supported collegial partnership. Research in the area of professional learning would seem to indicate that a sustainable approach to professional learning with technology is three pronged. Firstly, it provides the opportunity for educators to develop competency in use of technology. Secondly, it engages educators in learning about current research in the field. Finally, it enables educators to consolidate their learning through the analysis of their current practice (Ingvarson et al., 2005). What is needed is a way to incorporate the relationship between technology and literacy into this model to enable change that reflects re-contextualised views of literacy in the twenty-first century in a three pronged approach to professional learning.

FIGURE 2.6

Action-Reflection Model for Teacher Professional Learning



Model used in the Victorian PICTL project. Adaption of reflective action model developed by Howard and Walsh (2005).

2.7.1 Using Technology to Connect

It can be suggested that early years educators may need to develop an understanding of how digital technology can be used in order to provide a bridge between home and school learning. The following section explores research that uses digital technology to connect home and school experiences and is important for this study because it highlights views that need to be considered for professional learning when working with early years educators.

O'Rourke and Harrison (2004) report on an Australian study describing the implementation of the KidSmart computer program in early childhood settings. The study took the form of collaborative practitioner research and survey questionnaire. The researchers reported that whilst the integration of computers into the early childhood settings caused some issues, a key benefit was that for some children the use of the computer provided a connection between home and school (O'Rourke & Harrison, 2004). Bearne and Wolstencroft (2006) reported on a different study of 28 children aged eight to nine in a class in East Anglia in England. Their study aimed to find out about how children could use their knowledge about computer games and texts to enhance their knowledge of traditional texts. The findings indicated that "young writers moved between the textual worlds available in the classroom and at home" (Bearne & Wolstencroft, p. 90) and the integration of these experiences with oral, written and visual texts had the potential to improve learning through exploring interests using existing knowledge (Bearne & Wolstencroft, 2006). It is argued that in order to participate effectively in society children need to understand the way in which different meanings can be constructed through

the interactive and independent deployment of language, image and digital rhetoric (Unsworth, 2002). Current rhetoric suggests that if schools do not address each of these areas and ignore the cultural shift from “print culture to visual culture” (Green & Bigum, 1993, p. 127) a mismatch between learning at school and learning in the community will harbour rising levels of student disengagement.

The term ‘authentic learning’ is widely used to refer to learning that connects with the experiences of the students. More recently it has been used in connection with the argument that questions whether school learning is ‘learning for school’ or ‘learning for outside of school’ (Lankshear et al., 2000). Learning as preparation for life in society embraces ‘authentic’ learning as ‘learning for outside school’. However, in this context engagement in literacy learning occurs through participation in social practices rather than school-like practices (Lankshear et al., 2000). Similarly, Herrington et al. (2010) refer to authentic e-learning as closely matching the real world. Viewed in this way print-based literacy, visual literacy, and new literacy learning are connected both inside and outside of school, building community connections and opportunities to break down perceived barriers between school and learning in the real world. Elkind (2007) explains “as the boundaries between home and school become increasingly permeable, home and school are looking more and more alike” (p. 199). The technology at the school is in the home and vice versa providing an authentic platform for families to be involved in learning. A similar recommendation came from a study in England by Plowman, Stephen and McPake (2008) where findings suggested that educators in early childhood settings need to develop ways of engaging young children in authentic learning experiences with technologies that more closely resemble those found in the home. It seems that technologies are creating a link between home and school and a platform for authentic learning. These findings highlight the importance for the current study of developing through professional learning, educator understanding of the use of technology in order to make connections between home and school learning.

Access to technology has been an on-going concern for educators. Some argue that the infusion of technology across the curriculum poses an equity issue for students with access to the latest technology and those without. Thus, students in wealthy communities may access the latest and greatest in technology where students in less wealthy communities may have limited access to technology through restricted budgets and expenditure. Overall, students in these communities do not have the access to the range of technology of their wealthier counterparts. Arguments are emerging to support the importance of access for all children (Downes, Arthur et al., 2001). In discussing issues relating to access to technology Marsh (2007) warns against the trappings which stem from assumptions about socio-economic status and children’s access to technology. Marsh (2007) claims that the focus for educators working with young children should be on developing understanding of the technology and how it can be used to achieve aims, rather than assumptions relating to access. Thus for equity, access to digital technology in formal education settings is even more important and

professional learning in relation to this study needs to address issues relating to access to digital technology.

Access to ICT is linked to a blurring in boundaries between school and home communities (Lankshear et al., 2000). Gannon and Sawyer (2007) refer to data from the Organisation of Economic Co-operation and Development (OECD) that shows that in international testing Australia is a 'high quality-low equity' country, which in short means that there is a relationship between social advantage and educational advantage that in theory contributes to a widening of the gap. Following the line presented by Marsh (2007) concerns about the gap between information-rich and information-poor communities could be extended to information-rich and information-poor learning environments in and out of school. Plowman et al.'s (2008) study follows in line with Marsh's (2007) claim:

...children in 'disadvantaged' families may be granted more access to technological items precisely because they have been acquired cheaply and are easily replaced, whilst 'more advantaged families' may be restricted to occasional and highly supervised use of expensive equipment, sometimes needed for work purposes. (Plowman et al., 2008, p. 105)

Access is not necessarily the problem. It seems that whatever access to technology exists among families, children in the early years who are denied experiences using technology in literacy-rich environments at school and pre-school with skilful educators are disadvantaged (Arthur, 2001; Carrington, 2001).

To withdraw from embracing expanded notions of literacy incorporating technology into the classroom is to contribute to the disparity between school learning and learning grounded in the real world. Luke (1999) notes it is the responsibility of all educational institutions to address the urgency of this equity issue: "...it becomes all the more important that all levels of education provide all children with access, appropriate resources and skills that will be absolutely crucial for meaningful work place participation in the decades ahead" (p. 99). This responsibility extends to pre-school where continuity in literacy learning is supported through the affordances of play experiences for building on and connecting previous learning (Kennedy & Surman, 2007). It follows that the literacy learning that can be developed through play extends to digital literacies given child access to appropriate play resources and experiences.

A second argument for ensuring children's access to technology in the early years of education is highlighted by Turbill and Murray (2006) who suggest that the introduction to computers in the early years of education is a useful way to counterbalance gender imbalance in access and usage. They purport that the teacher as a mediator of children's experiences with computers can ensure balanced gender access to computers and to children's use of a range of programs (Turbill & Murray, 2006). In another study by Plowman et al. (2008), in 3 and 4 year old pre-school, concerns were raised about children's opportunities to develop understanding of cultural dimensions of the technologies, including gender, in preschool settings due to the limitations of available technology.

The study found that the focus of the technology in these settings was on computers and there was no ownership by the children of the technology that was largely used as a play activity in the pre-school setting. Further, the researchers referred to impoverished “technologically mediated interactions” (Plowman et al., 2008, p. 107) with the children highlighting the need for research that provides insight into the effective pedagogy for the application of digital technology to the literacy context in the early years of formal education and subsequent professional learning.

Comber (2001) puts forward another interesting argument for ensuring equity in distribution of information and communications technology in the early years of education. She argues that if the practices that young children are involved in throughout the early years of education are to be significant beyond the school gate, then the acquisition of literacies needs to include “ethical, cultural, moral stances, views about knowledge, ways of working, organising, thinking and interacting” (p.177). The implication incumbent in this statement is that a critical literacy approach to literacies is paramount and needs to begin in the early years so that children’s literacy repertoires include analytical practices that will enable them to be discerning in the world of e-literacies. Further support for this view comes from Edgar and Edgar (2008) who warn that many children spend “seven hours of cumulative time each day, every day exposed to different forms of media –more time than they spend in school” (p. 63). They argue that educators in the early years have an obligation to foster ethics through media and technology in preparation for citizenship. A similar view is put forward by Siraj-Blatchford and Whitebread (2003) who argue that young children need to develop deep understanding of technologies that are part of their lives to make informed technological choices. Equity in this sense extends beyond access to information and communications technology to providing pedagogy oblivious to social class, gender or wealth as access to skills and knowledge, allowing all young people to exploit the meaning making potential of information and communications technologies and new literacies (Sefton-Green, 2001) in ways which promote lifelong learning. This is an important argument in support of critical literacy and technology use, and these views must be considered in approaches designed for this study.

2.8 Summary

The literature review has suggested that any study exploring the relationship between technology and literacy in the early years of education, through early years educator experiences of technology and literacy, needs to consider the attitudes, beliefs and understandings about literacy which teachers and young children bring with them to the classroom. From the literature it is suggested that the teacher mediates child access to, and the use of, technology, which in turn impacts on children’s learning experiences (Locke & Andrews, 2004), and children’s attitudes, beliefs and understandings of literacy will inadvertently influence the level of engagement in literacy learning. The literature suggests that new pedagogies and new ways of teaching, learning and accessing information need to embrace expanded views of literacy, moving beyond print based literacy to viewing literacy as social practice and design for social futures (Kress, 2000; New London Group,

1996). The literature emphasised the notion that engaging child and teacher practices means thinking about what technology and literacy integrated experiences mean for children. It was further suggested that preparation for social futures should begin in the early years of education and that technology may provide a medium for bringing together 'school' learning and 'out of school' learning experiences in a way which fosters productive social futures.

The literature points to the advantages of a nexus between an holistic technology and a socio-cultural-critical literacy perspective for the affordances of technology to be realised in the literacy context (Bigum & Green, 1992). Furthermore, the literature supports a re-contextualised view of literacy that moves away from an emphasis on skills that are familiar to the world of work in a previous age (Cope & Kalantzis, 2000; Kalantzis et al., 2003; Kress, 2000; New London Group, 1996) toward diversity, creativity and collaboration. Being literate in contemporary society necessitates the ability to make meaning using a variety of different modalities (Cope & Kalantzis, 2000; Gee, 2003; Healy, 2004; Kress, 2006a; Snyder, 2001) and the relationship between literacy and technology to be acknowledged in both documentation and pedagogy (Bigum 2002, Durrant, 2001; Lankshear & Knobel, 2006; Snyder 2001). Thus ways to promote change in teacher practices are required.

A number of reasons were proposed throughout this literature review to explain why early years educators have not integrated new literacies and paper based literacies in innovative ways. In essence, though the literature supports the view that educator practices needed to change so that learning in formal education settings is more consistent to learning in the world but the issue remains how to bring about this change in practice. Research that provides insights into how this can be done effectively is needed.

The literature indicated that studies which explore teacher practices of the application of technology to the literacy context should begin with teachers' understandings of, and competence with, technology (Coiro, 2005; Ingvarson, Meiers & Beavis, 2005; Labbo, 2006). It was acknowledged throughout the literature that teacher willingness to engage in new subject matter is influenced by their beliefs and understandings (Andrews, 2004a; Durrant & Green, 2000; Freebody et al., 2008a; Martello, 2007; Snyder, 2008). The literature further highlighted the need to examine teacher practice more closely (Edwards, 2005). Some of the studies in the literature explored educator attitudes to popular culture, media and/or digital technology in the classroom and concluded that educators have concerns about the amount of time children spend engaging in these activities (Marsh et al., 2005) and require support to apply technology to the literacy context effectively (Marsh et al., 2005, Turbill, 2001). This theme in the literature suggests that approaches to professional learning should enable early years educators to interrogate existing beliefs, assumptions, build upon their existing knowledge bases and be supported throughout the learning process.

The literature highlighted further issues surrounding teacher pedagogical practices in relation to technology and literacy in the early years of education. It indicated that the affordances of

technology for literacy learning lie with the teacher (Andrews, 2004a, Freebody et al., 2008b; Labbo & Reinking, 2003). In their role as educators, teachers control children's access to technology, the range of learning experiences with technology that children are exposed to, and the ways in which children interact with technology in their learning environments. Some theorists proposed models for looking at literacy practices and planning for integrated learning experiences (Durrant & Green, 2000; Hill et al., 2004, 2007, 2010; Zammit & Downes, 2002). Others identified key elements of effective literacy pedagogy (Downes, Arthur et al., 2001; Loudon et al., 2005; Comber, 2006) that could be applied to contemporary contexts. The literature provided several insights into pedagogical considerations.

Another significant issue in the literature drew attention to the ways in which planning for authentic learning experiences for children (Plowman et al., 2008) assists educators to capitalise on interests (O'Rourke & Harrison, 2004) and funds of knowledge that children bring with them to learning (Labbo & Ryan, 2010). It was further noted that activity –orientated (Durrant & Green, 2000) or inquiry approaches that harness children's natural curiosity (Bruce & Bishop, 2008; Elkind, 2007; Marsh, 2006; Siraj-Blatchford & Whitehead, 2003) may foster children's active engagement in use of media and technology (Edgar & Edgar, 2008, Edwards et al., 2001) and contribute to the effective application of technology to the literacy context. In other studies describing effective integration of technology, the social use of technology, through the provision of group and collaborative learning opportunities, was identified as an enabler of learning (Hill et al., 2004, 2010; Walsh, 2010, 2001; Zevenbergen, 2007). These threads, throughout the literature, highlighted the changing nature of the teacher's role and the need for access to technology resources in the early years.

In active, inquiry based pedagogy the literature highlighted the role of the teacher as being a co-learner or guide in the learning process (Comber et al., 2007). The literature suggests that such pedagogy will require access to flexible and customisable technology (Johnson et al., 2009) used in different ways to cater for different learning needs (Freebody et al., 2008b; Kalantzis et al., 2005; Keamy et al., 2007).

The literature review suggested that professional learning that focuses on a teachers' pedagogical content knowledge (PCK) is essential for changing educators' beliefs and practice. Thus, any professional learning program needs to enable teachers to bridge the digital divide and this requires opportunity to interrogate individual beliefs and assumptions about literacy learning (Durrant & Green, 2000; Freebody et al., 2008a; Martello, 2007). Further, this professional learning should be conducted as part of the whole school community so that teachers feel supported by the education community in this process, and should begin with teachers' understandings (Coiro, 2005). It was further argued in the literature that approaches to professional learning engage educators in reflective practice (Cambourne & Turbill, 2007; Lankshear et al., 2000) and provide opportunity to incorporate new theoretical learning into practice (Marsh, 2003). A final consideration was the need to ensure that approaches to professional learning take into consideration teacher competence with ICT (Lankshear

& Snyder, 2000) and opportunities to improve this if needed, so that issues relating to sustainability of professional learning programs can be addressed.

2.10: The Present Study

The present study attempts to explore early years educators experiences of the relationship between technology and literacy. It is critical thus to position the study within contemporary understandings of pedagogical approaches to literacy and technology.

It was noted in the literature that teachers are key mediators of children's experiences and engagement with technology in the learning environment (Andrews 2004b) and as such any attempt to realise the affordances of technology applied to the literacy context must begin with the teacher. The present study sought understanding of early years educator experiences of technology and literacy through a focus on the parallel interplay between teacher beliefs and assumptions about technology and literacy and the application of technology to the literacy context.

In the early years of education there has been a predominant emphasis on paper based, functional literacy models and this study attempts to engage early years educators in exploring expanded notions of literacy in which paper based literacy is part of an expanded view of literacy connecting in and out of school learning and social futures. The study uses the action-reflection model (McNamara et al., 2006) to assist early years educators to plan and reflect on their processes.

In contemporary society there is concern for the superficial nature of a monetary expenditure on technology in education, which is already proving hard to deliver, without addressing ideological, philosophical and educational underpinnings necessary to prepare students for the 'knowledge society' and 'education revolution'. The present study seeks to address this concern by engaging educators in an examination of their pedagogy using technology that is available and accessible to them. As such, the focus of the study was not on using the latest and greatest technology but the use of existing resources in a manner consistent with views presented in the literature that embrace communities of collaboration (Keamy et al., 2007). In this way it aimed to build sustainability into the professional learning experience through a focus on process approaches and active engagement in learning.

The next chapter details the theoretical and methodological approaches to the study. It describes the research design, research sites and the role of the researcher. The theoretical and methodological framework is described in detail followed by data collection strategies and data analysis procedures employed throughout the study.

2.11 Glossary of terms

Approaches: Methods and strategies for literacy teaching and learning

Balance: Equilibrium

Child centred: the child's needs and interests are at the centre of learning.

Communication (IT): the process of exchanging information to create meaning.

Communities of collaboration: Community of learners who learn through collaboration and interaction with others.

Connectionist perspective: Perspective of cognitive development concerned with nurturing the development of skills through overlearning.

Creativity: the use of the imagination to create new things and ideas.

Critical literacy: Focuses on examining the way in which texts are used to create meaning

Cultural-critical perspective: refers to a literacy perspective that embraces both a socio-cultural and critical literacy perspective.

Deep and surface learning: Deep learning is learning that stimulates higher order thinking and surface learning refers to learning associated with measurable outcomes and skills.

Developmental readiness: Readiness for learning can be nurtured through appropriate learning experiences designed to promote skill development.

Digital divide: The generation gap that exists in the digital ecology. Theorists argue that as educators we are 'outsiders' to the digital ecology and 'insiders' to the technology that existed when we were born. In contrast, the students we teach are 'insiders' to the digital ecology and 'outsiders' to the technology that is no longer a part of the world they were born into (Gee, 1993; Green & Bigum, 1993; Lankshear & Knobel, 2006).

Digital ecology: Environment we live in today that is influenced by digital technology

Digital literacy: Refers to literacy associated with digital texts.

Discourse: Discourse with a capital 'D' is used to describe more than one discourse coming together with other things such as beliefs, attitudes and feelings.

Dynamic pedagogy: Pedagogy that is functional and goal directed, relevant to the learners, develops deep literacy learning and understanding, uses explicit pedagogy, involves learners in monitoring their own learning, acknowledges individual literate identities in relation to their community, incorporates a diverse range of learning opportunities and uses appropriate resources.

Epistemology: Relationship between the inquirer and the known.

Explicit teaching: Clear and overt instruction in literacy, particularly in relation to phonics and reading skills.

Functional literacy: Focuses on measurable literacy skills, such as phonics and grammar, that once mastered can be used as benchmarks for compliance.

Genre approaches: Approaches that advocate direct instruction whereby the teacher provides explicit explanations of text types.

Higher order thinking: Thinking at a level higher than rote learning.

Holistic and integrated teaching practice: Teaching practice that incorporates the whole learning process rather than segmenting learning into skills and steps to be mastered.

Holistic technology: Technological practices that give total control to the doer over the process of creation.

Interplay: Interaction or relationship between two or more things.

Kindergarten: In Victoria, kindergarten refers to 3 year old and 4 year old prior to school setting.

Learning by Design model: Model for curriculum planning that acknowledges the four knowledge processes; experiencing, conceptualising, applying and analysing.

Learning environment: A formal education environment for learning.

Lifelong learning: Learning from birth throughout life.

Literacy: Refers to the ability to communicate and function effectively in society.

Maturational readiness: Readiness for learning that occurs when children reach the appropriate mental age for the learning behaviour.

Multiliteracies: Coined by the New London Group (1996) to describe changing ways of communication due to new technologies.

New literacies: Literacies associated with globalisation and technological advancement, such as digital literacy.

New pedagogies: Pedagogies required for new learning environments.

Ontology: Theory of being. The form or nature of reality.

Paper based literacy: Reading and writing paper based texts.

Pedagogy: The how and what of teaching.

Personalised learning: An approach to learning that has four tenets; learners are central, ICT, lifelong learning and communities of collaboration.

Place based literacy: Approach to literacy that incorporates expanded views of literacy and ICT.

Preparatory: In Victoria Preparatory or Prep, refers to the first year of school.

Prescriptive technology: Technology practices that require the doer to work through a series of precise steps to develop a product.

Print literacy: Skills, knowledge and understanding of printed text.

Process-orientated approaches: Approaches to teaching and learning that focus on the learning process rather than the product.

Rote learning: Learning from memory through repetition.

Scaffolding: Refers to guided practice or support at the level of the zone of proximal development.

Social constructivist perspective: Views learning as a social process (Vygotsky, 1978).

Social learning(IT): Skills, behaviours and attitudes for effective communication with others.

Socio-cultural literacy: Focuses on the social and cultural factors that influence literacy learning.

Symbiotic: Mutually beneficial relationship.

Traditional literacy: Reading, writing, listening and speaking

Transformative curriculum: Curriculum that places value on learner differences and the ability to be creative problem solvers within a supported learning community (Exley, 2008).

Tuning: Focussing.

VELS- disciplinary strand: Areas of study in VELs with subject specific knowledge skills and behaviours.

VELS-interdisciplinary strand: Areas of study in VELs focussing on thinking, problem solving and communication across a range of subject areas.

VEYLDF: Framework for use by early childhood professionals to foster learning from birth to eight years. Embedded in the framework are the National Early Years Learning Framework Birth to 5 years and VELs level 1 and 2.

Visual literacy: Refers to literacy associated with visual texts, such as texts containing images.

Whole language: Holistic approach to literacy learning. Using a whole language approach reading is taught as a meaningful unit and instruction begins with whole texts in which sub skills are developed from the whole.

CHAPTER 3

SCAFFOLDING THE EXPLORATION

From Theoretical to Methodological Framework

I don't pretend we have all the answers. But the questions are certainly worth thinking about.

Arthur. C. Clarke.

3.1 Introduction

In this chapter the design for the study is explored. The design has been informed by the findings in the literature discussed in Chapter 2. The theoretical and methodological framework is described with reference to the key themes in the literature and the consequent research questions. Data collection methods and data analysis techniques are also detailed here. The chapter concludes with a discussion of the limitations, and ethical considerations of the exploration.

3.2 Establishing a Theoretical Framework

Mallette and Duke (2011) suggest that although literacy research can be carried out in many different ways, as can research into technology, it should always be grounded in theory and epistemology. Methodologies and methods are “grounded in epistemology, or one’s view of what can and cannot be known and how” (Mallette & Duke, 2011, p. 2). Hence, the theoretical paradigm, “or interpretive framework” (Denzin & Lincoln, 2005, p. 22) used for the research should be appropriately aligned to epistemology, ontology and methodology, as it is through the interpretative paradigm, containing the principles of the researcher, that research is structured. Table 3.1 illustrates the epistemological integrity (Marshall and Rossman, 2011) of the study and the following discussion articulates the alignment.

TABLE 3.1

Illustration of the Epistemological Integrity of the Study

The Research Question <i>What are early years educators' experiences of the relationship between technology and literacy in early years learning environments?</i>				
	Ontology Philosophical assumption about the nature of reality and truth (Creswell, 2007)	Epistemology Philosophical assumption about the relationship between researcher and that being studied (Creswell, 2007)	Methodology Conceptualisation of the research (Creswell, 2007)	Methods
Question	(Reality is constructed in the minds of those involved). What is the form and nature of reality? How does it relate to 'truth'?	(Researcher and 'researched' are interrelated, not independent). What is the relationship between the inquirer and the known? What is the nature of 'truth'?	How do we know the world or gain knowledge of it?	
Worldview (the researcher's basic beliefs /paradigms guiding the action)	Constructivists, and more particularly, Social Constructivists assume there are multiple realities and reality is socially constructed. " <i>Multiplicity of plausible realities</i> " (Cambourne, 2003 p. 418) which are interpreted by the researcher. "Truth comprises the inevitable conclusions about what is important, pervasive, salient and dynamic in a particular human context" (Cambourne, 2003 p. 418)	• Interactive link between the researcher and participants through co-construction of knowledge. • Values are made explicit. • Subjective truth is confirmable through proper conduct of study and analysis of data (Cambourne, 2003)	• Naturalistic qualitative research methods. Multiple lenses to understand human experiences (Montero, 2011). Field Study • Researcher subjectivity is made clear throughout the study. • "Credible, trustworthy explanation' of observed variables (Cambourne, 2003 p. 418)	
The Current Research	• Individual or co-construction of reality. • Educator, student, researcher participant. • Educator beliefs and understandings result in practice • Narrative and the notion of story • Story: truth from Multiple perspectives.	• Constructivism • Social Constructivism- Human beings construct or make knowledge	• Narrative Construction • Ranges of Sources of data Collection (Teachers, Researcher) • Case Study narratives, - 2 separate learning environment case studies within (Yin, 1989)	• Semi structured interviews • Teacher reflective journal • Researcher Observations, reflective journal and field notes • Artefacts and photographic samples

Guba (1981) calls naturalistic inquiry a paradigm. This study was framed within the naturalistic inquiry paradigm and adopted a qualitative research approach as the appropriate lens through which to examine the phenomena. Burns (2000) highlights key strengths in using qualitative approaches to research in formal education settings:

Qualitative descriptions can play the important role of suggesting possible relationship(s), causes, effects and even dynamic processes in school settings. Qualitative methods can highlight subtleties in pupil behaviour and response, illuminate reasons for action and provide in-depth information on teacher interpretations and teaching style. (Burns, 2000, p. 13)

A key characteristic of qualitative studies is in the framing of the research questions (Lodico et al., 2010). Qualitative studies are framed within questions designed to “explore, interpret or understand the social context” (Lodico et al., 2010, p.143). The overarching research question guiding this study: *What are early years educators’ experiences of the relationship between technology and literacy in early years learning environments*, aimed at exploring educator’s knowledge and understanding of the potential relationship between technology and literacy in the natural social context of the early learning environment, in order to provide insight into strategies for, and approaches to, technology that may transform literacy learning in the early years of education in the future.

Qualitative research also involves deep understanding gained through in-depth study. Lichtman (2006) describes in-depth study as a critical element of qualitative research because of its investigation of the whole issue and the examination of the layers that contribute to the whole. In doing so “much of qualitative research involves studying and looking at a few individuals, sometimes just one” (Lichtman, 2006, p. 13) to enable the necessary depth of understanding to be achieved. Illuminations stemming from in-depth qualitative studies are described in words and themes rather than numbers associated with quantitative research studies (Lichtman, 2006; Lodico et al., 2010). This study utilised data collection instruments and tools which enabled the depth of understanding to be articulated.

The use of a qualitative framework for this study has been further supported by Cambourne’s (2003) call to make a clear distinction between developing understandings of what happens in early years learning environments as opposed to making statements about what *should* occur in them:

Describing and understanding what actually does happen in settings like classrooms is quite different and distinct from describing what one thinks should be happening in them. (p.421)

Cambourne (2003) provides a summary of characteristics that relate to early childhood research. He recommends that:

- the research is carried out in natural settings where detailed observations are made with the purpose of understanding the phenomenon or human experience being studied

- Data collected from observations may be in the form of field notes and video or photographic images, work samples from children and early years educators and transcripts from conversations and dialogue with children and early years educators.
- Studies are usually conducted over extended periods of time and the data are revisited often to provide deep understanding of the phenomena under study.

Naturalistic, qualitative research is defined by the researcher's philosophical belief system and as Cambourne (2003) suggests, it is the way the researcher deals with philosophical issues that determines the research process. Thus, the overt characteristics noted above and referred to by Cambourne (2003) as accoutrements, formed considerations in the current study.

Denzin and Lincoln (2000) suggest that “qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them” (p. 3). Qualitative research seeks to describe and understand the human experience rather than providing cause and effect (Richards & Morse, 2007). The role of the qualitative researcher as interpreter is crucial as “descriptions, understandings, and interpretations are based on the data you collect and your ability to organise them to make a meaningful whole” (Lichtman, 2006, p. 12).

Underpinning qualitative data analysis is a broader acknowledgement of the complexity of seeking understanding through multiple realities, voices, subjectivity of data and interpretation (Denzin & Lincoln, 2000). Qualitative researchers acknowledge there are many ways of knowing (Guba, 1981) and therefore data should be gathered in a variety of ways to provide additional layers to the developing understanding of the phenomena. Further, Lodico et al. (2010) note that in qualitative research the “researcher is likely to take an interactive role through which she or he gets to know the participants and the social context in which they live” (p. 143). In order to provide insight into the guiding research question this study required the researcher to be a part of the teacher's class practice and to interact closely with the participants in the study. Indeed, at the core of this study is the co-construction of knowledge between researcher and participants.

Thus the paradigm of naturalistic inquiry provides the umbrella framing the methodology of this research and the application of qualitative approaches. The theoretical perspective of the constructivist paradigm provides the dynamic from which the fabric of the study is woven.

3.2.1 Constructivism: A Theoretical Foundation for the Methodology

The theory of constructivism provides a multiple platform for this study, first of all providing the lens through which the researcher's worldview of learning may be seen (Chapter 2, Section 2.2.1, Cognitive Development and Early Literacy) and secondly as a theoretical foundation for the development of the methodology of the study.

A constructivist research paradigm emphasises connection between action and praxis (Denzin & Lincoln, 2000) and in doing so encourages participants to move beyond the role of

observer toward social action: “constructivists desire participants to take an increasingly active role in nominating questions of interest for an inquiry and in designing outlets for findings to be shared more widely within and outside the community” (Lincoln & Guba, 2000, p. 175). In this way control is embedded in ‘voice’ as the voice of participants needs to be heard in the process of knowledge construction and action. Through this process the study focus emerges (Mertens, 2005). The constructivist paradigm, through the recognition of multiple realities and multiple voices, views truth as ‘anti-foundational’ in the sense that any claim to permanence is tied to relationships between stakeholders in the community (Lincoln & Guba, 2000). In a naturalistic inquiry truth is relative and seeking truth is about identifying assumptions which “best fit the phenomenon under study” (p. 77). In this way valid knowledge is subject to agreement in the stake-holding community and eventuates through dialogue, hence the transactional, dialectical epistemological stance demands data collection methods with a communal emphasis on credibility; through different voices and different realities truth and valid knowledge are established. Constructivism embraces this understanding and provides a foundation for the methodology. Within the constructivist paradigm, narrative approaches offer an appropriate opportunity to explore the depth of teacher’s understanding of the relationship between technology and literacy in the early years learning environment.

3.2.2 Narrative Approaches

Narrative inquiry (Chase, 2005; Montero & Washington, 2011) has been described as a particular type of qualitative research. Gordon, McKibbin, Vasudevaqn, and Vinz (2007) maintain that narrative inquiry invokes “the need to question rather than work from hypotheses, listen rather than categorize and present ambiguities rather than certainties” (p. 349). Narrative researchers use story as the instrument of questioning, listening and exploring ambiguities. Through a process of telling and retelling stories, narrative researchers argue that a deeper understanding of the phenomenon under study can be reached than can be achieved with quantitative studies. Coulter and Smith (2009) argue that “narrative research strives to portray experience, to question common understanding” (p. 577) of the real world, whilst conventional research strives to confirm knowledge about the real world. In a study of the particular, the narrative researcher focuses on the human experience situated in place and time (Riessman, 2008). Montero and Washington (2011) suggest that in the field of literacy research narrative inquiry appeals to those who embrace the social, cultural, historical and political dimensions of literacy. For those who hold a re-contextualised view of literacy, or a definition of literacy as social practice, narrative research offers an opportunity to explore “questions that lead to the understanding of storied human experiences and their impact on past, present and future experiences of participants and researchers” (Montero & Washington, 2011, p. 334) and thus can provide rich insights into “contextually, temporally and socially” (Montero & Washington, 2011, p. 334) situated literacy pedagogy. Given that this study embraces the social, cultural, historical and political dimensions of literacy, and endorses a definition of literacy as social practice, the use of

narrative and story approaches fits seamlessly into the philosophical, theoretical and methodological approach of the study.

Connelly and Clandinin (2006) refer to the 'telling' as the most prevailing form of narrative in which interpretations and meanings are generated from the participant stories. Other theorists refer to this form of narrative as *inquiry into narrative* through the emphasis on the stories told and the meaning generated from the stories (Connelly & Clandinin, 2006; Montero & Washington, 2011). The second narrative approach is 'living' and this form of narrative tells an unfolding story of life (Connelly & Clandinin, 2006). This narrative approach moves beyond telling stories as it seeks to understand the phenomena under study in the context of the participants' life as it unfolds its stories (Montero & Washington, 2011). 'Living' as the form of narrative inquiry was of considerable importance to the study because interpreting and generating meaning from the early years educators' lived experiences of technology and literacy in their learning environments was the focus of this study. Further, in the second phase of the study it was necessary for the researcher to move between observer - participant and participant-observer roles in order to understand and tell the unfolding story of people's lives over time, and as the intervention of the researcher's involvement became a part of the development of the teacher's understanding, it was imperative that multiple perspective and stories were captured.

There are several terms used in narrative inquiry that require explanation. In the present study the terms used align with those described by Gordon et al. (2007). They describe *story* as "an account through which experiences are linked with the related story line" (p. 327). This is not to be confused or interchanged with *narrative* which refers to the representation of the *story* after it has been collected, organised and analysed (Gordon et al., 2007). The researcher takes on the role of *narrator* "using *story* and *narrative* as *research*" (Gordon et al., 2007). This action places the *narrator* in a particular place and time and makes the *research* a situated activity. Hence, the role of the researcher as *narrator* is pivotal to the study "for storying the research journey and understandings that emerge along the way" (Gordon et al. 2007, p. 327). When viewed in this way narrative inquiry is "interpretative and situated research" (Gordon et al. 2007, p. 327) and the role of the researcher as an active listener is significant in capturing the richness of participant stories in a range of different ways (Gordon et al. 2007; Montero & Washington, 2011). Data collection methods for this study were selected and, or designed, to enable this to occur.

A strong characteristic of narrative inquiry is the scope and time frame of the research. Narrative inquiry studies tend to be small in scope and time consuming (Chase, 2005; Montero & Washington, 2011) however, the socio-cultural contexts of participants can be large (Montero & Washington 2011). Lodico et al. (2010) note that "narrative inquiry focuses on the experience of individuals" (p. 146) and as each individual story is important for the rich understanding it provides, studies tend to focus on just one or two individuals. It is suggested that in some ways narrative research can act as a catalyst for social change (Chase, 2005; Montero & Washington, 2011). This is

one of the reasons why narrative researchers consider how to represent the participant's voice as the narrator "both during interviews and while interpreting them" (Chase, 2005, p. 652) as it is through the rich voice of the participant that change can be effected. These characteristics can be identified in the current study which, whilst small in scale involving predominantly two educators, is nevertheless broad in socio-cultural context, this being the early years learning environment.

In each learning environment being studied the socio-cultural context includes the individual classroom of children, professional learning environments, the education community and pedagogical issues impacting on uptake and issues relating to children's engagement, such as education experiences outside of formal education. The societal context of this study resonates with prevailing views of narrative inquiry where "narratives are socially situated within the specific context in which they are told" (Lodico et al., 2010, p. 147). In the current study a narrative approach aimed to advance social change in particular in phase 2 through assisting educators to gain knowledge of pedagogical approaches to the application of technology to the literacy context in the early years of education.

The chronological sequence of experiences of participants is an important characteristic of narrative approaches (Creswell, 2007; Lodico et al., 2010). Narrative research can be distinguished by chronology (Creswell, 2007) or through other means such as flash-backs and flash-forwards, used for representing the passage of time (Coulter & Smith, 2007). As such, participants can be seen as narrators and the process of collection, organisation and analysis of these stories is seen as a collaborative construction (Montero & Washington, 2011) between "researcher-listener and participant-narrator" (Lodico et al, 2010, p. 146). Creswell (2007) and Gordon et al. (2007) refer to the importance of "active collaboration" (p. 57) in capturing the participants' experience. For the researcher, it is through restorying of narratives, using data from a variety of different sources, that themes are identified and meaning constructed (Lodico et al., 2010). Coulter and Smith (2009) purport that in narrative research "knowledge is constructed through transactions among researchers, participants, evidence and the social context" (p. 588). Through using multiple lenses to understand the human experience a multifaceted understanding of the individual stories of participant-narrators is required (Montero & Washington, 2011). A multifaceted approach to understanding these "richly textured human experiences" (Montero & Washington, 2011, p. 332) embraces the context, the story, the teller and the listener (Montero & Washington, 2011) in a collective narrative which represents an amalgamation of data from different sources (Creswell, 2007). It is a rich understanding of the phenomenon that is the product of this process as it is through "time and process-orientated accounts" that interpretations emerge. In this study the use of reflective and iterative praxis, learning journals and a cyclical design enabled the collective narrative to be developed.

There are a number of theoretical assumptions underpinning narrative inquiry. The first assumption is that through the organisation of events we perceive as important and the way in which we perceive our actions over time, we make meaning or sense of our lives (Chase, 2005; Lodico et al., 2010). Chase (2005) makes particular mention of ensuring that analytical lenses for narrative inquiry

should express the participant's or narrator's point of view through emotions, thoughts and interpretations. The second assumption is that narrative researchers view "narratives as verbal action" (Chase, 2005, p. 657). It is through this assumption that narrative inquiry can be a framework for social change as narrative inquiry researchers consider the unique voice of participants and the social purpose behind this voice (Lodico et al., 2010). The third assumption emphasises the context within which the given narrative occurs; social, political and historical (Chase, 2005; Lodico et al., 2010) using the lens to gain an understanding of similarities and differences across narratives (Chase, 2005). The fourth assumption acknowledges that narratives are particular to setting, audience and purpose (Chase, 2005; Lodico et al., 2010) and thus is a joint production between narrator or participant and listener or researcher. Lodico et al. (2010) illustrate this by pointing out that a narrative of a typical school day might differ depending on the context, in this case who it is presented to; a parent, principal or close friend. The final assumption underlying a narrative inquiry involves subjectivity as researchers are also narrators as they develop interpretations and present ideas about the narratives studied (Chase, 2005; Denzin & Lincoln, 2000). Each of these assumptions is described by Chase (2005) as lenses that are interconnected, and through which researchers move between when "hearing, collecting, interpreting and analysing" (Chase, 2005, p. 658) depending upon their approach to the material studied.

An underlying purpose of this study is to understand the human experiences of the early years educators as they go about their daily practice in their particular learning environments. The unique social, political and historical context of each early years educator's learning environment needed to be acknowledged and provides a lens through which to understand the similarities and differences in each unfolding story. In the current study it was important to utilise a variety of forms of data collection tools to capture early years educator or narrator point of view and to give voice to participants through the analysis. The study acknowledges that the stories shared by early years educators were unique to the setting, audience and purpose and as such would be a joint construction between participant and researcher. In acknowledging the subjective nature of narrative inquiry the researcher as narrator, interpreted and expressed understanding of the data that represents each early years educator's story.

3.3 Narrative Methodology

Creswell (2007) describes narrative research methodology in terms of "studying one or two individuals, gathering data through the collection of their stories, reporting individual experiences and chronologically ordering (or using life course stages) the meaning of those experiences" (p.55). Theorists argue that it is through the process of analysis of narratives such as interview data, that the stories are constructed and meaning is made (Montero & Washington, 2011). It is narration that "provides a space to think through, analyse and process the confusion in the data" (Montero & Washington 2011, p. 338) and it is through this scrutinised process that the researcher or inquirer comes to understand the human experience (Gordon et al., 2007). Further, as it is inevitable that

participants will choose the stories or elements of stories they will tell, it is through the restorying process that ‘reality’ is explored through the multiples lenses.

In the present study a naturalistic, qualitative research method using narrative construction and restorying was employed because of its ability to generate meaning from the ‘lived’ experience of participants. Aligning with the narrative inquiry belief that multiple lenses are required to understand human experiences (Montero & Washington, 2011) data from a range of sources was collected and, in keeping with narrative approaches, was “analysed and combined to form a coherent and meaningful narrative” (Lodico et al., 2011, p.147) expressed in chronological sequence.

Establishing the Narrative

Various writers address the characteristics of narrative research. Examples of the considerations proposed by Connelly and Clandinin (2006) and Creswell (2007) are summarised in Table 3.2. The work of these authors draws more closely on anthropological approaches or living story than on the more traditional quantitative based educational research approaches.

TABLE 3.2
Characteristics of Narrative Research: Two Perspectives

Connelly & Clandinin (2006)	Creswell (2007)
• ‘imagining a lifespace’ • living and telling as starting points for collecting field notes • defining and balancing the commonplace • investment of self in the inquiry • “researcher –participant relationship” • “duration of the study” • “relationship ethics & narrative inquiry • “himself or herself into the study.” (pp. 214-215)	• Focusing on a single individual (or two or three individuals) • Collecting stories about a significant issue related to the individual’s life • Developing a chronology that connects different phases or aspects of the story • Telling a story that restories the story of the participant in the study • Telling a persuasive story in a literate way • Possibly reporting themes that build from the story to tell a broader analysis.

The suggestions of both of these theorists have been woven into the fabric of this study with particular reference to the considerations described by Connelly and Clandinin (2006). The following paragraphs will ‘set the stage’ illustrating the incorporation of the considerations using the work of Connelly & Clandinin (2006).

The first considerations identified by Connelly and Clandinin (2006), *imagining a lifespace*, refers to creative thinking about “the chosen topic, along with possible participants, as existing in an ever shifting space” (Connelly and Clandinin, 2006, p.481). This study of early years educators’ perspectives of the relationship between literacy and technology employed a range of data collection methods to capture everything that was happening within the changing lifespace. Thus interviews, learning story journals, work samples, photographs and researcher journal were all used. The second

consideration; *living and telling as starting points for collecting field notes*, according to the authors, highlights the way in which narrative inquiry uses field texts from participant-narrators by investigating the phenomena through “*life as lived in the past (telling) and life as it unfolds (living)*” (Connelly & Clandinin, 2006, p. 482). In the present study the early years educators’ understanding of the relationship between literacy and technology was captured in the passage of classroom life in their learning environments as it unfolded.

Connelly and Clandinin (2006) describe the third consideration as *defining and balancing the commonplace* (p. 482). This consideration refers to the essential commonplace features in the study that are defined and balanced in terms of being researchable components. The essential commonplace features in the present study were two early years learning environments in a regional area in Australia. It involved early years educators willing to explore the relationship between literacy and technology in their practice. The fourth consideration for narrative inquiry is that of *investment of self in the inquiry* (Connelly & Clandinin, 2006, p. 482). Narrative inquirers find themselves in the field texts and thus part of the inquiry and should plan for this participation and how it will be documented. Montero and Washington (2011) claim that this personal nature of narrative research is a valued characteristic where distance between researcher and participant is more congruent to telling stories than other objective approaches.

In the second phase of the present study the researcher was intimately engaged in a support role for each of the early years educators. The type of support provided to each early years educator varied according to the needs of the participants and was documented in the researcher journal. It could be said that the fourth consideration for narrative inquiry gives rise to the fifth. Connelly and Clandinin (2006) describe the fifth consideration as “*researcher-participant relationship*” (p. 482). It is through the participation of the inquirer in the inquiry that intimate relationships between researcher and participant develop. In the current study the inquirer listened to the participant’s stories about their experiences with technology applied to the literacy context. However, the impetus for the study came from the inquirer’s experiences with the literacy and technology in her teaching practice. During the time frame of the data collection the *lived* experiences of participants were intimately captured through a range of qualitative data collection methods, and the relationship between inquirer and participants was integral to capturing the rich complexity of the human experience.

The “*duration of the study*” (Connelly & Clandinin, 2006, p. 482) is the sixth consideration for narrative inquiry. Narrative approaches are time consuming (Montero & Washington, 2011) and this study was no exception. Starting points of the present study were influenced by the importance of getting to know participants’ needs so that appropriate support and resources could be provided. This was followed by a six month period of data collection to ensure that an adequate amount of time was provided for the lived experience of participants, past and present to be captured. The complexity of this process gives rise to the final consideration for narrative inquiry, “*relationship ethics and narrative inquiry*” (Connelly and Clandinin, 2006, p.483). “Ethical considerations permeate narrative

inquiries from start to finish” (Connelly & Clandinin, 2006, p. 483) and negotiation of research text between researcher and participant aims to ensure that representations of participants’ experiences are considered accurate. In the current study a conference paper (McLean, 2009) that was based on early findings from this study and presented at a national conference was negotiated with participants and co-presented with participants at the conference. Furthermore, in order to ensure that the material presented in this research text captured the participants’ voice a range of data was collected and the final story was negotiated and is discussed in detail later in the chapter.

There are three elements of narrative inquiry which are used to place data in a meaningful context; temporality, sociality and place (Connelly & Clandinin, 2006). It is argued that data should be placed in a context encompassing an understanding of the incident and participant in past, present and future (temporality), the personal and social conditions (sociality) and the “geophysical space in which the inquiry takes place” (Montero & Washington, 2011, p. 338). Connelly and Clandinin (2006) emphasise that it is the “simultaneous exploration of all three” (p. 479) that distinguishes a narrative inquiry from other forms of qualitative research. The research study reported in this thesis embraced all three elements in placing data in a meaningful context. Temporality was represented by the understandings of technology and literature the participants brought to the early learning environment and those they developed over time. Sociality was represented by the nature of the learning and interaction between technology and literacy for both teachers and children, and place embraced the multi dimensions of learning within the formal setting of the early learning environment.

Dressman and McCarthy (2011) claim that “every method has something valuable to contribute to literacy research, yet no one method can cover the issue that researchers need to address in literacy teaching and learning research” (p. 460). It is further argued that the differences in each method can be viewed as strengths through the knowledge that each provides (Dressman & McCarthy, 2011). Some theorists suggest that a synergistic approach to research methodologies is desirable as methodologies can be mutually inclusive (Mallette & Duke, 2011). This view was adopted in the present study. Whilst the methodology is focussed upon narrative construction, it is case study that is the tool for data collection.

3.4 Case Study as a Tool for Gathering Stories

Case study can be a method in its own right, or it can be used as a tool to appropriately gather data to inform the narrative. Stake (2000) describes case study in terms of what is being studied and it is this perspective which has been applied in the present research. Case study is widely recognised as a qualitative research strategy (Lichtman, 2006; Mertens, 2005) particularly in the field of education (Creswell, 1998). Yin (1989) defines case study as empirical enquiry that “investigates a contemporary phenomenon within its real-life context; when boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (p. 23). From a position of a constructivist learning paradigm in which knowledge is built, Stake (2000) acknowledges

the importance of the experiences of others in the construction process. Further, as constructivists view knowledge as socially constructed, the constructivist case study researcher observes, interacts, interprets the experience and assists the reader to construct their own knowledge. The experiential knowledge or qualitative understanding from case study comes “largely with narratives and situation descriptions of case activity, personal relationship, and group interpretation” (Stake, 2000, p.455). These entities mirror the complexity of the present study and the comprehensive understanding needed to provide insight “within a complex context” (Mertens, 2005, p. 237). Barone (2011) stresses that case study is the study of a bounded system, in which what is included and excluded can be defined.

Yin (1989) determined case study as an appropriate research strategy for research questions in the form of ‘how’ and ‘why’, focussing on contemporary events where little control over behavioural events is required. The research question of the current study is; *What are early years educators’ experiences of the relationship between technology and literacy in early years learning environments?* The relationship between technology and literacy is a contemporary phenomenon requiring no control over behavioural events in the natural context of the classroom. Thus case study method was appropriate for this study.

Case study can be singular or collective. In collective case study the “researcher may jointly study a number of cases in order to investigate a phenomenon, population or general condition” (Stake, 2000, p. 437). In collective or multiple case study design, as described by Yin (1989), “the same study may contain more than a single case. A common example is a study of school innovations (such as open classrooms, teacher aides or new technology) in which independent innovations occur at different sites” (p. 52). Barone (2011) suggests a better understanding of the phenomena under study as a reason for selecting collective case study. This research study incorporated two case studies of two different learning environments in which literacy and technology were the focus of the study. One learning environment was a kindergarten [pre-school] for 4 year old children and the other was a classroom for Preparatory [first year of school] children. Two early years educators participating in the study were working in their individual learning environments and the stories of each educator’s experiences with technology applied to the literacy context are told in the study.

Creswell (2007) emphasises the importance of purposeful sampling for qualitative research as individuals and sites chosen for study are selected on the grounds of how they “can purposefully inform an understanding of the research problem and central phenomenon in the study” (Creswell, 2007, p. 125). In narrative research, purposeful sampling is important because the story is usually drawn from one or two participants selected according to the criteria of the study (Lodico et al., 2010, p. 143). Given the lengthy nature of narrative inquiry, it is important the participants are “accessible, willing to provide information, and distinctive for their accomplishments and ordinariness or who shed light on a specific phenomenon or issue being explored” (Creswell, 2007, p. 119). This was the case in the present study. The individuals were chosen for their willingness to be involved, but even more for

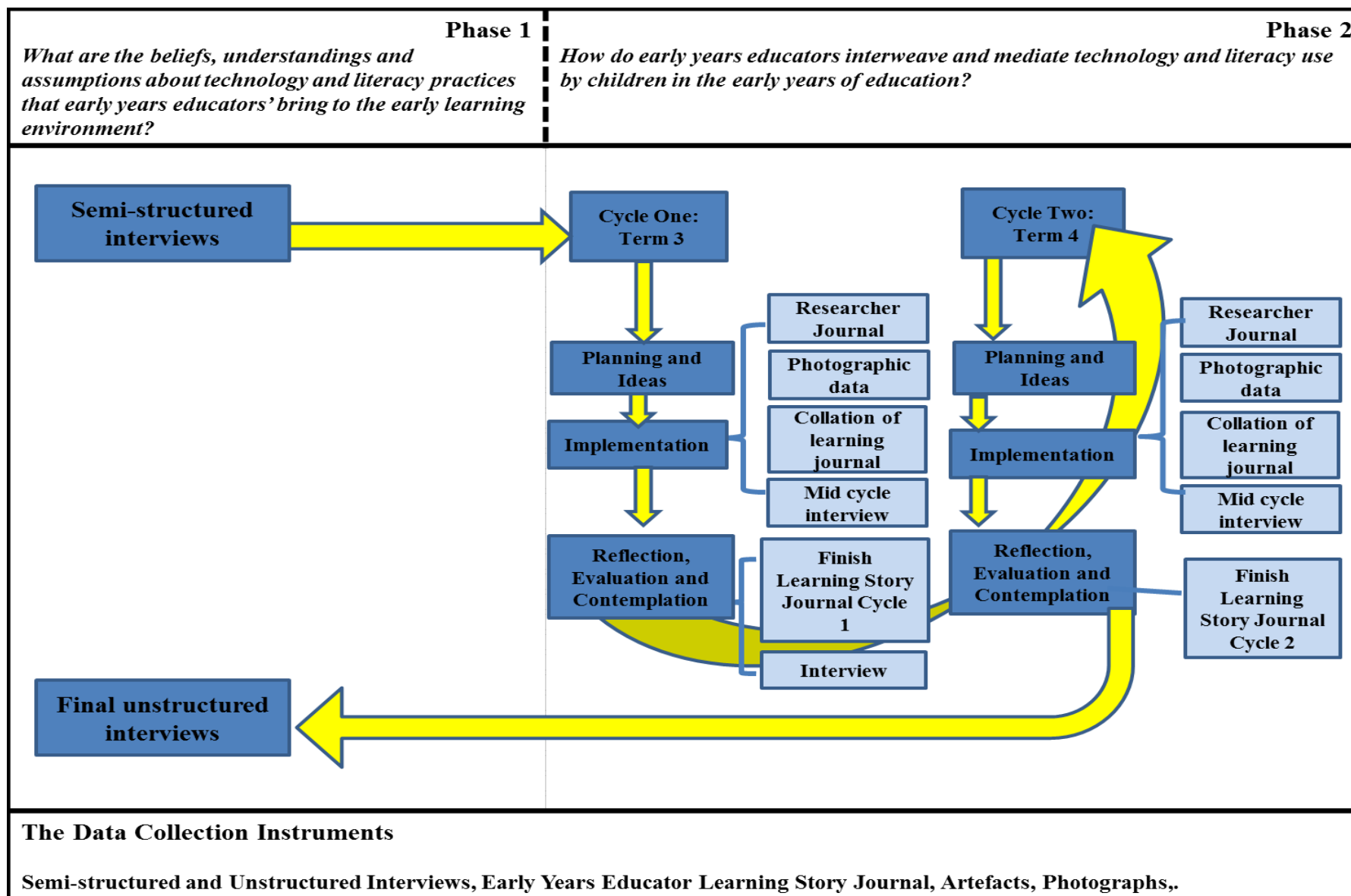
their ‘ordinariness’. Both were typical of early learning practitioners and neither had participated in research before.

3.5 Study Design

The overarching question of the study was: *‘What are early years educators’ experiences of the relationship between technology and literacy in early years learning environments?’* This question was operationalized through two further questions which generated a two phase study. Exploration of the first operational question of the study *‘What are the beliefs, understandings and assumptions about technology and literacy practices that early years educators bring to the early years learning environment?’* was sought in Phase 1, predominantly through initial interviews with each of the two early years educators and was accompanied by the observations and interactions of the second phase of the study. Operational Question 2 of the study: *How do early years educators interweave and mediate technology and literacy use by children in the early years of education?* was investigated primarily in the second phase of the study through the use of case study which involved the researcher as participant observer and supporter of the two early years educators as they reflected and documented their practice using a modified dual cycle action-reflection model to scaffold the collection of data which formed their stories in the narrative. Figure 3.1 illustrates the phases of the study and the processes used in each phase.

FIGURE 3.1

The Design of the Study



The following sections describe the data types and collection methods used in the study and the way in which multiple sources of data contributed to the narrative.

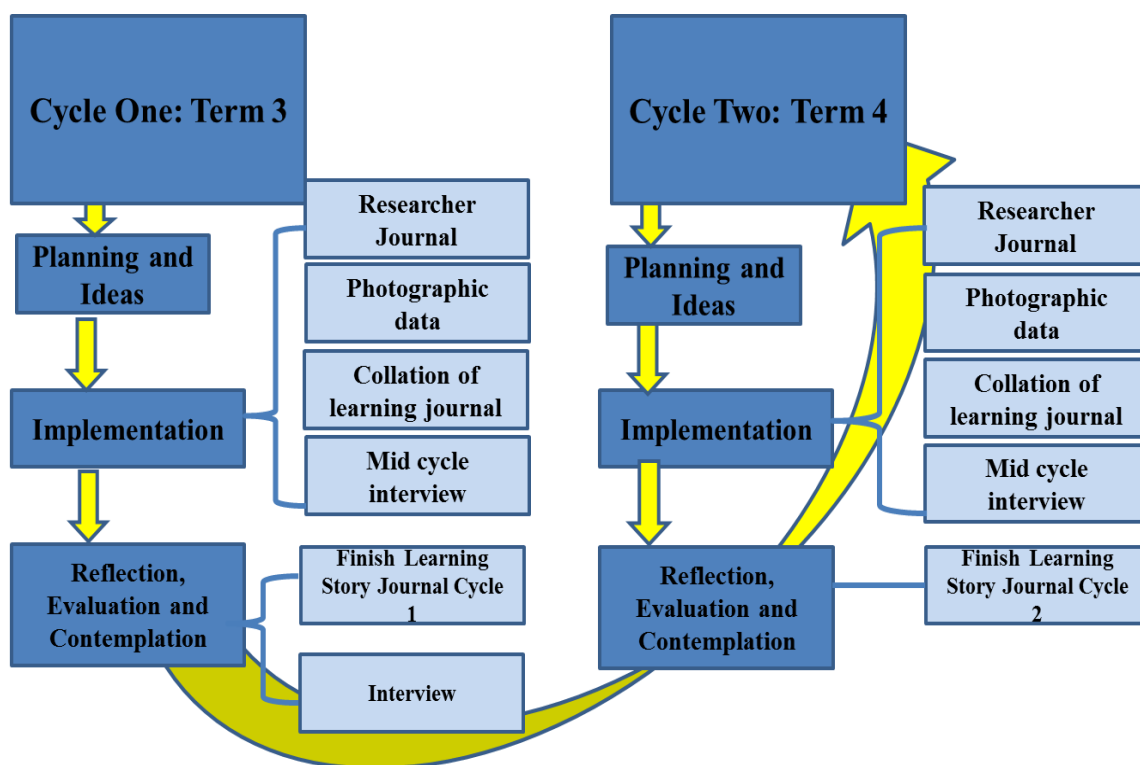
Denzin and Lincoln (2000), Creswell (2007), and Montero & Washington (2011) suggest that a variety of data collection methods are necessary in qualitative research to bring meaning and understanding to the problem. According to Creswell (2007), there are six types of data collected in qualitative studies, these being “information, documentation, archival records, interviews, direct observations and physical artefacts” (p. 63). Burns (2000) classifies the collections of these forms of data into three categories: observation, interviewing, and document analysis. It is through the analysis and restorying of the data collected using these actions that a meaningful narrative is formed (Lodico et al., 2010). The present study used an array of data to inform the exploration, namely,

- individual semi-structured and unstructured interviews with early years educators;
- educator learning story journals (LSJ);
- artefacts (such as work samples)
- photographs from each learning environment;
- reflective researcher journal.

As illustrated in Figure 3.1 the first phase of the study commenced with a structured interview with each of the early years educators. The data collection in the second phase of the study comprised two cycles. Each cycle began with a planning session and mid-way through the cycle early years educators were interviewed about their progress in each cycle. At the end of each cycle there were interviews with the early years educators to reflect on and evaluate the cycle and to contemplate future directions. At the end of the second cycle this interview also became the final interview in the study. Each cycle included the collation of the learning story journal by participants, photographic data and researcher journal entries. The cycles corresponded to the beginning and end of terms three and four of the school year in the state of Victoria. The cycles are outlined in Figure 3.2.

FIGURE 3.2

Data Collection Cycles Identifying Major Methods of Data Collection.



3.5.1 Interviews

The Semi-Structured Interview

The study commenced with a semi-structured interview with each early years educator. Kvale (1996) describes the semi-structured interview as highly suitable for qualitative research through a focus on themes:

Technically, the qualitative research interview is semi-structured: It is neither an open conversation nor a highly structured questionnaire. It is conducted according to the interview guide that focuses on certain themes and that may include suggested questions. (p.27)

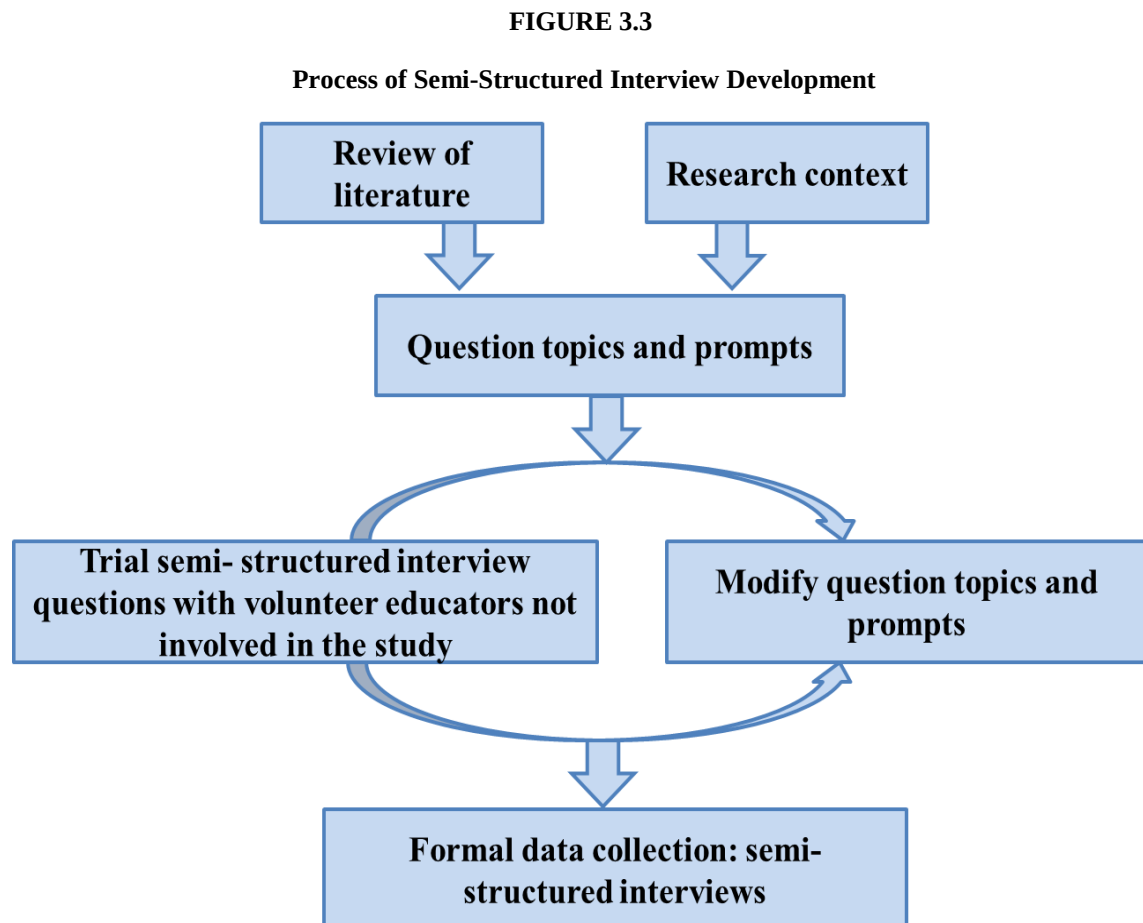
A similar view is portrayed by Lichtman (2006) who describes the semi-structured interview as one in which a general format and set of questions are followed with all participants, but which also provides flexibility to modify delivery to vary questions according to the situation. The rationale for the semi-structured interview in the present study was that it would provide scaffolding to initiate discussion about beliefs and understandings of literacy through the use of an interview guide, without leading the participant to narrow or researcher influenced responses. This was achieved in the study:

...through a free-flowing conversation, relying heavily on the quality of the social interaction between the investigator and the informant, that [could] be subtly

redirected by the interviewer if it should stray too far off the track of the research study. (Burns, 2000, p. 425)

In the semi-structured interviews the participants' responses were sought without intrusion from the researcher but with opportunity to redirect focus if needed.

The process for piloting questions and developing appropriate interview skills for the semi-structured interviews is described below in Figure 3.3.



Denzin and Lincoln (2000) describe the interview as “a conversation, the art of asking questions and listening (p.633). Whilst an unstructured interview can provide greater depth and breadth in data through open-ended dialogue, a structured interview controls question delivery ensuring there is little variation in responses (Fontana & Frey, 2000).

Kvale (1996) emphasises six quality criteria for interview:

- The extent of spontaneous, rich, specific and relevant answers from the interviewee.
- The shorter the interviewer's questions and the longer the subjects' answers the better.
- The degree to which the interviewer follows up and clarifies the meanings of the relevant aspects of the answers.

- The ideal interview is to a large extent interpreted throughout the interview.
- The interviewer attempts to verify his or her interpretations of the subject's answers in the course for the interview.
- The interview is “self-communicating” – it is a story contained in itself that hardly requires much extra descriptions and explanations. (p. 145)

Using Kvale's (1996) criteria, questions were formulated to be open ended and to allow for the participant to provide detailed responses, through the researcher seeking clarification and probing for more detail using conversational dialogue when required. The researcher trialled the interview questions with educators who were not participating in the study prior to implementing with early years educators to ensure that Kvale's (1996) criteria were adequately addressed. By the completion of the trial process, interview questions for collecting initial stories from participating educators were finalised (See *Figure 3.3*).

A second consideration in designing the interviews was relationship building. Lodico et al. (2011) stress that management of entry into the field for narrative researchers requires the researcher to “develop close emotional ties to a person...with a shared set of experiences” (p. 166). Prior to the initial interview the researcher made four weekly visits of about 3 hours duration, to each learning environment in order to establish good field relationships with the two participants. During this time one of the participants expressed nervousness about being recorded during the initial interview. In response to this concern, and to allay any feelings of discomfort during the interview process, the researcher provided each participant with the interview questions one week prior to the initial interview. In the interests of obtaining naturalistic data, crucial to narrative inquiry, this opportunity was provided to ensure that the distance between the researcher and participants was reduced and collaboration between researcher and narrator was fostered (Lodico et al., 2011).

Mertens (2005) recommends using an interview guide when preparing to interview participants so as to ensure there is scope in the interview to follow up on issues raised that had not been considered whilst covering all essential areas. Using the trial process described above, in which questions were developed from the literature and through observations in the early childhood settings, an interview guide was devised. In the interview guide key areas for the interview were identified and a range of possible open ended questions were provided for each area. The focus areas for the interview and the questions included in the guide are detailed in Appendix 1.

Initial Interviews

The early years educators were interviewed prior to commencement of the six month data collection period of the study. The purpose of these interviews was to gather their stories about their previous experiences with technology, and their personal beliefs about literacy and technology in the early years of education. Mertens (2005) recommends that in preparation for interviews researchers should schedule and interview at the convenience of the participant. This recommendation was

adhered to in the present study and interviews were carried out at the end of the day, after participants had finished teaching and children had gone home.

Data collection procedures for narrative inquiry include “spontaneous incidents from storytelling, eliciting stories through interviews, and asking for stories through such mediums as the internet” (Czarniwska, as cited in Creswell, 2007). In the present study interview data were used as a key source for obtaining participant stories before, after and during the study in addressing the question of phase one of the study. The initial interview was used to gather participant stories about their individual beliefs, assumptions and experiences of technology applied to the literacy context. The stories provided in the initial interviews not only acted as a guide for the support that would be required in phase 2 in each learning environment, the stories also provided an opportunity for the teachers to consider their position in terms of their understanding of the relationship between literacy and technology. For this reason it was important that quality interview data were obtained and careful preparation was given to the development of questions that “lead in important directions, producing new, trustworthy and interesting knowledge” (Kvale, 1996, p. 159).

In summary, the purpose of the initial interview was to begin capturing the stories of the participants. The significance of the initial interview in the present study was the role that it played in directing attention to the temporal commonplace. The initial interview aimed to provide insight into each participant’s past and present commonplace and to provide direction for the future observations and interviews.

Interviews During and at the End of the Study: Unstructured Interviews

In the present study the opportunity to reflect on the process and contemplate the next part of each participant’s story (phase 2) was provided through the collation of Learning Story Journals (LSJ) and further interviews. (An explanation of the Learning Story Journal is presented in Chapter 3, Section 3.5.2). In the subsequent interviews, held during, and at the end of the data collection period, the unstructured interview technique was adopted. However, in these interviews the purpose of the interview was to elicit stories (Creswell, 2007) which might, in particular, shed light on the mutual benefits of the interaction of literacy and technology in each learning environment.

The unstructured interview format was chosen, for this part of the study, to enable early years educators to freely discuss and elaborate on the content they had included in their individual Learning Story Journals (LSJ). Mertens (2005) describes the role of unstructured interviews as having “a human to human relationship with respondents and to understand their perspective” (p. 387). For narrative researchers the unstructured interview is important because researchers “attend to the stories that people *happen* to tell during interviews but also work at *inviting* stories” (Chase, 2005, p. 660). The process of inviting stories through interview necessitates an unstructured interview format where interviewees feel encouraged to share experiences beyond responding to set questions.

The interview format was an important consideration during these stages of the study as a key goal of the Learning Story Journal (LSJ), which is discussed in detail in Chapter 3, Section 3.5.2, was to highlight critical incidents and moments in the learning environment where the symbiosis of literacy and technology was recognised in practice. The documented incidents then became the source of inspiration for the interview, the genesis for deeper understanding and the catalyst for further innovation of technology in the literacy context. Chase (2005) recommends “a broad open question that will invite a personal narrative (p. 662) as one method of inviting stories in interview. In the present study this method was employed using the documented stories recorded by early years educators in their LSJs as impetus for discussion in the interview. The format further followed recommendations by Chase (2005) for the interviewee to become a narrator using artefacts relevant to their story. These artefacts included work samples from the children and the photographs and documentation collated by the participant-narrators to tell their story.

When conducting interviews of this kind the researcher must be prepared to ask good questions that will invite elaboration of the personal story. In the present study interview participants were encouraged to freely express their thoughts and feelings about theirs and the children’s experiences of literacy and technology in their individual learning environments through the sharing of critical incidents across each documented domain. Throughout the interview early years educators were encouraged to actively reflect upon, interrogate, elaborate and contemplate the episodes described in their LSJs in ways that provided insight into how they were embracing literacy and technology in practice. At the conclusion of each interview each participant was encouraged to consider the next step in their journey by describing how the experiences they shared in the interview and journal would inform what they tried next with literacy and technology in their individual learning environments.

At the end of the study a final interview was conducted with each participant. These interviews followed a similar format to the unstructured interviews conducted throughout the study. The interviews began with participants sharing the experiences documented in their LSJs and concluded with reflection on experiences and involvement in the study over the data collection period. An emphasis in these interviews was capturing how each participant recognised their collective story as contributing to their understanding of the relationship between technology and literacy, and to their development as an early years professional.

The Voice of Leadership in the Learning Environment: An Adjunct Participant

The voice of institutional leadership was seen as important in the study, not only because it was the leader (principal or director) who gave permission to conduct the study, but also because leadership was seen as an influential medium in determining the strength of the relationship between technology and literacy in the learning environment. In the kindergarten learning environment, the participant was also the kindergarten director and as such the study acknowledged the dual voice of

educator and leader as one in this learning environment. This was not the case in the school setting and thus it was important to capture the voice of the principal in the school learning environment. The principal had expressed support and interest in the study from the beginning. Thus he became an adjunct participant in the study in activating the voice of leadership in the second early years learning environment. His initial interview was conducted using the semi structured format of the early years educator interviews. The same areas were identified and focus questions used throughout the interview. The purpose of this interview was to capture the principal's story as another layer to unfolding the preparatory educator's story. Thus the beliefs and assumptions that were important to the principal and shared with the school community were captured, to provide a further lens to view the practice of the early years educator in the construction of the final narrative.

The final interview with the principal followed a similar format to the final interview for early years educators. The purpose of this interview was to capture the principal's voice at that point in time in the study, in the same timespace as the early childhood educator.

The data collection for all interviews followed the approach outlined by Creswell (2007) involving an audio digital recording of interviews, which were later transcribed and given back to participants to check for accuracy in the transcription. The role of the researcher advocated during the interview process was predominantly as listener. The listening role of the researcher in narrative inquiry is advocated (Gordon et al., 2007, Lodico et al., 2010) as it is through a process of active listening that participant stories will unfold in interview.

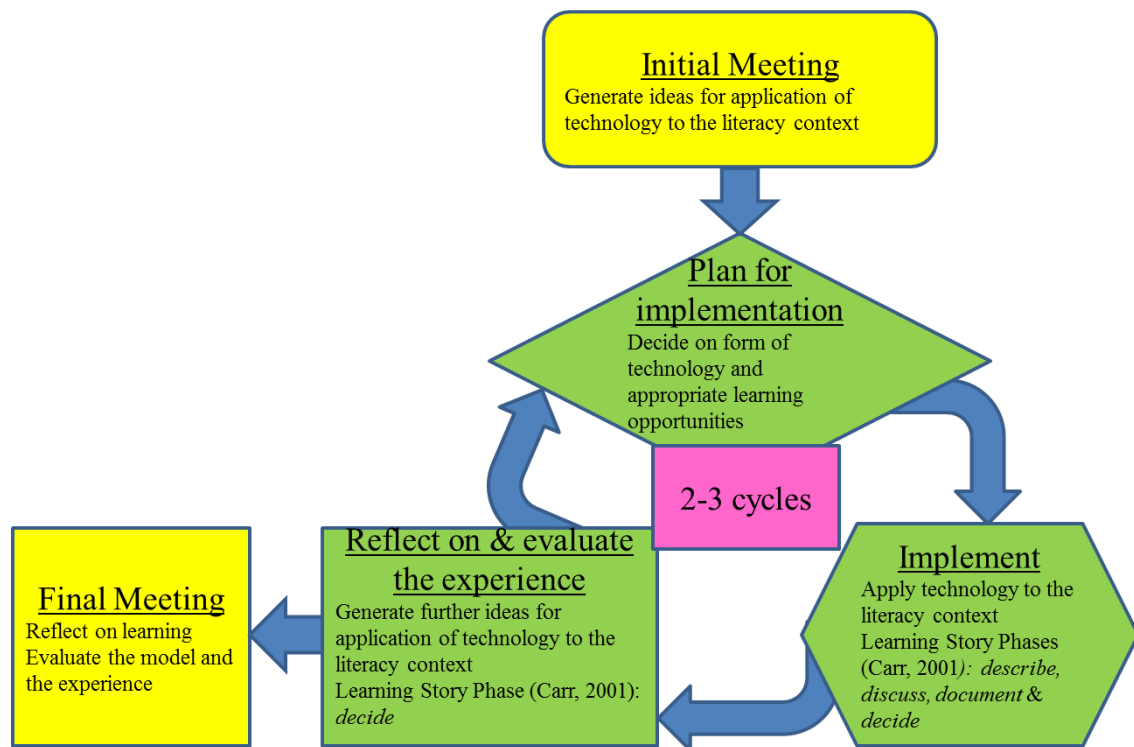
3.5.2 The Action-Reflection Model: Actioning the Learning Cycles and Learning Story Journals.

After initial interviews were completed a meeting between the researcher and each participant was organised to plan for the cycles of the study and to introduce the participant to the learning story journals. A second role of this planning meeting was to establish a literacy and technology focus for each learning environment. Meeting times were determined by the participant. The researcher met with each participant separately to establish a plan of action as it was important for each participant to consider their own context and their own story. Furthermore, it was also important for the researcher to be immersed in the social world of each participant (Coulter & Smith, 2009) in order to understand their lived experience, and through active collaboration with each participant to ensure the participant voice and experience (Creswell, 2007) was captured in telling the story.

At the initial planning meetings the researcher introduced the action-reflection model (McNamara et al., 2006) to each early years educator. The model was adapted for use in the present study and is represented in Figure 3.4. The action-reflection model was used to inform the planning of each cycle of data collection in phase 2 of the study. As narrative research relies "on stories as a way of knowing" (p. 577) the researcher took care to explain that the number and duration of cycles that

would occur throughout the six month period would be determined by each participant as part of their lived experience.

FIGURE 3.4
Action-Reflection Model used in the Present Study.



Adapted from Action-Reflection Model (McNamara et al., 2006)

Following the introduction to the action-reflection model participants were introduced to the Learning Story Journal (LSJ) which was used by each participant to record critical incidents throughout each cycle.

Learning Stories and the Learning Stories Journal

Learning Stories originated as a form of portfolio assessment for young children in early childhood (Carr, 2001). Carr (2001) developed learning stories in response to the “traditional separation of the individual from the environment” (p. 5). The Learning Stories developed by Carr (2001) were created to look at learning dispositions rather than skills and knowledge. Carr (2001) argues that as an holistic approach to assessment, Learning Stories present a credit based view of assessing children’s learning through an emphasis on learning dispositions. Carr (2001) claims that Learning Stories focus on the child in the learning environment and through focusing on learning through the lens of learning dispositions a cumulative continuum of skills, knowledge, intent, learning strategies and motivation emerges. In this study the Learning Story format has been adapted for use as

a tool for participants to record critical incidents in both, their own and the children's learning in each cycle. The adaptation is described in the following paragraphs.

The credit based foundation of learning stories encourages educators to *describe*, *discuss* and *document* participatory learning examples where children are demonstrating effective behaviours across each domain, and to then use the information gleaned from this process to *decide* what to do next in their program (Carr, 2001). In essence, Carr (2001) describes the Learning Story process in four phases as it applies to children's learning. The first phase requires the educator to observe children's learning with reference to what they can do and through consideration of a child's readiness, willingness and ability to fully participate in the learning (*describing*). The descriptions generated stem from focussed and structured observations of children engaged in participatory learning. The second phase requires the educator to discuss their observations of children's learning with others; the children, staff and families (*discussing*). During this phase of the process the educator decides which of the observations will be made public through documentation. In the third phase the educator documents the learning using artefacts such as work samples, photographs and transcripts of children's dialogue to support the narration (*documenting*). Carr (2001) argues that "the attention paid to the documenting of Learning Stories sharpens the focus on important features of the children's learning, and provides a powerful support for the authentic assessment of that learning" (p. 137). In the final phase, the educator uses the Learning Story to determine what they will do next in the teaching and learning program (*deciding*). The *deciding* phase is significant in that the documented experiences of the learner in action are used to inform the program:

A key process in teaching is deciding what to do next. This includes responding to children's initiatives, taking the initiative, changing the direction, intervening. In many contexts this is called planning, but deciding also includes intuitive and spontaneous responding. (Carr, 2001, p. 159)

Throughout the Learning Story process the four phases overlap and, in doing so, capture the fluidity of the lived experience.

The current research considered that learning story journals were a rich and extremely useful tool in the domain of narrative research and could be well used by adults. The purpose of the present study was to explore teacher pedagogy in relation to the application of technology to the literacy context in the early years of education. In order to develop a deep understanding of the lived experience of this phenomenon, not only were rich, thick descriptions essential (Creswell, 2007) but also a field text that would enable each participant to tell their stories and share their experiences. Using the process and format described by Carr (2001) the Learning Story was adapted for use by participants to document their story throughout each cycle. For the purposes of the study each participant was asked to follow the Learning Story process; *describe*, *discuss*, *document* and *decide*, and to use the LSJ to document critical incidents that either contributed to their understanding of the relationship between technology and literacy or which changed their practice. Using the guidelines

presented by Carr (2001) participants were asked to include artefacts such as photographs, work samples and transcripts of dialogue to show connection between the story and the experience, and to actively seek out examples where either their own, or the children's experiences with literacy and technology contributed to a change in practice.

The Learning Story process was both preparation and process for the reflections, as the Learning Story phases were implemented throughout the cycle. The documented Learning Stories provided the focus and structure for the interviews conducted at the end of each cycle and the end of the study. Participants chose to complete digital versions of their LSJs. The final page of each LSJ consisted of a blank template with the two headings; *Short term review* and *What next?* Underneath each heading focus questions were aimed at encouraging early years educators to reflect on the critical incidents documented in their LSJs and to consider the implications for future practice. An example of a Learning Story entry can be found in Chapter 4, Section 4.4.1.

As noted previously, Connelly and Clandinin (2006) describe three elements of narrative inquiry which set it apart from other qualitative studies; temporality, sociality and place. Whilst other qualitative studies aim to capture the subjective voices and experiences of participants, narrative studies bring these three commonplaces into the inquiry space (Connelly & Clandinin, 2006). The purpose of the early years educator LSJ was to contribute to the array of research texts collected which not only captured the subjective voices and experiences of the early years educator, but which harnessed these within a meaningful context framed by temporality, sociality and place, enhanced with the assistance of photographic or visual data.

The participants' LSJs used in this study contributed, alongside other data forms, to the construction of the final early years educator narratives presented in Chapters 4 and 5.

Audio Visual Materials: Photograph Data

Photographic and video data in field based research is commonly used as a form of data generation. A number of advantages of using video data have been identified. Whilst much of the literature talks about video the pictorial information it provides refers to both still and moving images. The supporting modes in these are shared respectively and provide similar data. Banks (2001) highlights three reasons why researchers use digital photography in their field work:

If the researcher has any self-conscious agenda in their field work photography it is probably some aspect of documentation; to remember the experience, to show others how things looked, to record things too complex to be described in the notebook. (p. 114)

For any of these purposes there are benefits in using photographic data. Walsh, Bakir, Lee, Chung, Chung and colleagues (2007) describe benefits of using video data in field based research in terms of ease in generating data and transforming to records with readily available software to support this process. A key strength of using video data is in the affordance it provides to reveal details that cannot

be captured in field notes (Walsh et al., 2007). The same can be said for photographic data which can also pick up subtleties such as facial expressions and other qualitative characteristics.

A second benefit of video data which also pertains to digital photographic data is the affordance it can provide for “collaborative analysis” (Walsh et al., 2007, p.47). It is argued that the use of video data allows groups of researchers to unobtrusively observe and analyse the same events (Walsh et al., 2007). In this study, the use of digital photographic data enabled participants to collaborate with the researcher and assisted in providing an insider perspective on interactions in the learning environments under study. Abasi and Taylor (2007) further note that the permanence of video data, and by extension digital photographic data, enables the researcher to revisit the field as many times as required, thus providing an opportunity for deep understanding of the event. This view is supported by other naturalistic researchers who praise the affordances of video and photographic data for its ability to ‘freeze’ on-going behaviours for further analysis (Cambourne, 2003). Furthermore, it is noted that “working with images can thicken description” (Riessman, 2008, p. 179) and highlight minute details that are not easily captured in field notes. As a form of observation where human interactions are being studied, digital photography could be viewed as a tool for data generation.

Observation

Lichtman (2006) describes a form of observation used in qualitative research where researchers limit themselves to an aspect of human interaction. This is a particularly common form of observation in school settings where researcher access to classrooms for observations is not available for extended periods of time. In the present study digital photographs taken in the learning environments were used to provide further understanding of the unfolding story. Children, educators and the researcher took photographs during the study. Each image had a story to tell about the literacy experiences of the children and the early years educator, the learning that occurred or the mediation of technology in the natural setting.

Qualitative researchers tend to use participatory observation methods through interaction with the participants (Mertens, 2005). In this study the researcher was involved in ‘moderate participation’. Mertens (2005) describes moderate participation as a method of participation “where the researcher attempts to balance the insider and outsider roles by observing and participating in some but not all of the activities. “By maintaining the role of peripheral-member-researcher” (Mertens, 2005, p. 383) the researcher observed and interacted with children and early years educators in so far as the interaction provided an insider perspective for observations and data analysis. Lodico et al. (2010) emphasise that “all types of narrative inquiry emphasise strong relationships between researcher and participants” (p. 145). The strong emphasis on co-construction of texts demands the use of participatory observation methods. In this research study the peripheral-member-researcher role was carried out through supporting early years educator development and competence in technology, sharing and

brainstorming of ideas for curriculum development, and through providing scaffolding and support for planning and implementation of the literacy program.

The assumption behind observation is that deeper values and beliefs are expressed through behaviour (Burns, 2000). Observational and photographic data are relevant to each case study narrative as the interrogation of the deeper beliefs and views are pertinent to understanding why early years educators interweave and mediate technology in the literacy context in the ways that they do.

Researcher Journal and Field Notes

Robson (2002) notes that a full and complete record of all activities should be kept throughout the study as the researcher plays a critical role in design and implementation of research and is the “primary instrument of data collection and analysis” (Lichtman, 2006, p. 12). Researchers need to consider their behaviour, values and understandings and how these affect the research process (Lichtman, 2006). In qualitative studies social science and the researcher self are entwined. According to Grieshaber (2007) this is evident in the ways in which researchers write themselves into texts and achieve reflexivity and reciprocity through analysis of these texts. Gordon et al. (2007) describe the way in which, through narrative inquiry, collaboration can produce meaning from a study as multiple subjectivities and stances are explored. They further argue that collaboration exposes subjectivities and stances and through the “choices in narrating” (Gordon et al., 2007, p. 328) and the way participants and researcher are represented in the narration the research is accountable. In the present study a comprehensive reflective researcher journal was kept to capture the researcher voice. The interpretation of this analysis provided another perspective to view the participant stories.

Artefacts and Work Samples

The collection of artefacts used in this study includes audio recordings created by children using podcasting software, digital work samples created by children such as animations, and digital photographs taken by children. These artefacts and work samples are embedded in the stories of the early years educators and they are used in Chapter 4. The following section outlines the data analysis process and is followed by a brief discussion of the limitations and delimitations of the study.

3.6 Data Analysis

“Narrative analysis studies rely on stories as a way of knowing” (Coulter & Smith, 2009, p. 577). The captured stories of participants describe actions, events and happenings. Riessman (2008) describes narrative analysis as “a family of methods for interpreting texts that have in common a storied form” (p.11) that is particularly appropriate for interpreting both individual and group cases. In the present study the early years educators represented the individual cases and their learning environments constituted group cases. Through the process of analysis Riessman (2008) claims that the intention and language in the captured stories are interrogated in an effort to glean meaning beyond the content to which the language refers. Riessman (2008) describes the role of the narrative analyst to

determine “how and why incidents are storied” (p.11) and in doing so, analysis of the unit under study holistically, is favoured over fragmented themes or categories.

In keeping with the holistic tenets of narrative inquiry categories or themes can still be generated, however, a key difference between narrative analysis and other forms of qualitative analysis is that the participant story is kept intact. Any categories theorised come from the case rather than across cases (Riessman, 2008). Creswell (2007) stresses that “data collected in a narrative study need to be analysed for the story they have to tell, a chronology of unfolding events, and turning points or epiphanies” (p. 155). For this reason, the restorying process results in the participants’ experiences being storied in the setting as a chronological sequence of events. As previously mentioned, Connelly and Clandinin (2006) recommend analysing narrative data for the three elements of temporality, sociality and place, whilst others advocate structural analysis of the text through the “elements of plot structure” (Creswell, 2007, p. 159). However, regardless of the analysis process, the reader should be prompted to consider the broader issues beyond the content of the text (Riessman, 2008).

3.6.1 Thematic Analysis of Participant Stories

Riesmann (2008) describes a thematic approach to analysing oral, written and visual texts. Using a thematic approach for interview analyses, each case is reviewed to identify individual participant interpretations of the phenomenon under study. In order to represent the diverse interpretations the results are written up with extensive references to quotations to show emerging participant themes without fragmenting the story as a whole (Riessman, 2008). When a number of individual participant stories are collected over time from a range of data, each piece of data is analysed and placed in the chronological narrative at the appropriate place in time for the sequence. Following the reconstruction of the narrative the “researcher zooms in, identifying the underlying assumptions in each account and naming (coding) them” (Riessman, 2008, p. 57). Using this thematic approach, lengthy excerpts are interspersed in the research text alongside “interpretation, theoretical formulation and references to prior theory” (Reissman, 2008, p. 57) with the final narrative being a conglomeration from a range of data sources.

In the present study, a thematic approach to analysis was used for oral, written and visual texts. Table 3.3 places the current study in a thematic analysis framework. It is noted in the table that some excerpts published in a research text have been ‘cleaned up’ to be more readable but as Riessman (2007) notes “ambiguity remains, the investigator does not explore it, assuming a reader will ‘fill in’ and make sense of the main point” (Reissman, 2007, p. 58). Furthermore, in each participant’s narrative the local context is not explored. Although the co-construction process has been honoured, insights into this relationship are not obvious in the written report. Riessman (2008) notes that a “biographical account emerges “full blown” from the “self” of the narrator, rather than a conversation between a teller and particular listener/questioner” (p. 58). The relationship between researcher and participant is evident in the references throughout the text where the researcher is located in the

context; perhaps to provide an interpretative context to compare or contrast unfolding understandings emerging in the text. Finally, the interpretation of the written and oral texts captured in the present study does not attempt to analyse narrative form and language choice. Interpretations of the texts are based on assumed meanings as language is used as a resource rather than a topic of inquiry (Riessman, 2008). In the current study using thematic analysis has generated significant findings through searching for prior theory and new theoretical insights together, keeping the story intact, attending to time and place of the narration, and through a commitment to emerging theorisation of cases, but not across cases (Riessman, 2008).

TABLE 3.3

Thematic Analysis of the Present Study

Definition of Narrative	How Represented: Attention to the Form and Language	Unit of Analysis; Focus	Attention to Contexts
Two extended accounts of individual classroom experiences with technology and literacy; story of literacy and technology in each learning environment	Lengthy interview excerpts dispersed with artefacts, work samples and journal documentation; cleaned up speech; some attention to metaphors.	Early years educator understanding of literacy and technology	Local: Minimal co-construction process not part of final narrative Societal: Considerable interpretative commentary moves between participants theorising and broader social issues surrounding teacher uptake of technology

Note: Adapted from Riessman, 2008, p.75

Images in narrative inquiry can be interpreted as texts, just as written interview transcripts are (Riessman, 2008). Walsh et al. (2007) note that the analysis of video images should proceed in the same way as any other data collected from field based research and should begin early after the footage is taken. One perspective for analysing video images is to view them as events and to identify critical events within a timescale for analysis (Derry et al., 2010).

This view can be applied to photographs as data, where images have been captured to represent a critical event. Riessman (2008) recognises a parallel between photographic data and oral narratives: “A photograph stabilises a moment in time, preserving a fragment of narrative experience that would otherwise be lost. Transcripts of oral narratives similarly “fix” a moment in the stream of conversation” (p. 179). Given this parallel it follows that a thematic analysis approach could be applied to the analysis of digital photograph images. Using a thematic analysis approach, the data collected through images in narrative research is interpreted through words about the images (Riessman, 2008) in much the same way that meaning is gleaned from interview transcripts and other written and oral forms of data. In the present study photographs taken by the researcher, participants and children that did not form part of the early years educator LSJ were analysed in this way.

Riessman (2008) makes a distinction between images made with participants and images of participants. The notion of ‘photo voice’ is referred to as a means of providing participants with a tool that can act as a catalyst for change in their communities and can be used by participants to “story their meanings collaboratively with investigators (Riessman, 2008, p. 143). This was the approach taken with the LSJs kept by the early years educators in the present study. Teachers were asked to document critical incidents throughout each cycle using the LSJ and they were encouraged to use work samples and photographs to support this process. As such, the images included in the LSJ represented the ‘photo voice’ of the early years educator and were embedded in the story as each early years educator used words to interpret the events in relation to time, sociality and place represented in the images. The early years educator’s learning story then became the impetus for discussion in the interview. It was through the interview process that participant beliefs, assumptions and theories relating to the written and image text could be explored through dialogue and hence “move beyond ordinary ways of viewing” (Riessman, 2008, p. 145).

In narrative inquiry relationships between the researcher and participants will be collaborative and may include “deeply personal interactions” (Lodico et al., p. 146). The subjective nature of this relationship highlights the need to consider limitations and ethical considerations alongside other limitations associated with narrative inquiry and the use of case study. These considerations and limitations are discussed in the following section.

3.7 Limitations of the Study

There are a number of limitations and delimitations associated with the current study. These are discussed in the following section.

3.7.1 Subjectiveness and Confirmability

A limitation of many qualitative approaches to research is the “subjective nature of qualitative data and its origin in single contexts” (Burns, 2000, p. 12). Lodico et al. (2010) stress that researcher bias, experience and assumptions need to be considered in all qualitative research. However, in narrative inquiry, this is particularly important as researchers comb through the data in a restorying process. Using a thematic analysis approach in narrative inquiry to reconstruct a narrative, there are multiple opportunities for misinterpretation or misrepresentation of incidents. Gordon et al. (2007) acknowledge that the collaborative approach to understanding meaning emphasises multiple subjectivities and stances. Coulter and Smith (2007) argue that multiple interpretations act as persuasive tools which in turn assist narratives to stand on their own merits. Furthermore, through collaboration in narrative construction the researcher is encouraged to “think differently about the accounts that we [researchers] give, about the way we represent our participants and ourselves, and how our accounts make us accountable through our choices in narrating them” (Coulter & Smith, 2007, p. 328). Although it is considered problematic that researcher biases can influence findings, as the researcher has control over what is reported, and how data are interpreted and reported, it is not

suggested that objectivity needs to be achieved in qualitative research at the expense of “richness, uniqueness and contextuality of case study data” (Burns, 2000, p. 475) and narrative data. Instead, it is suggested that for confirmability, it should be possible to trace back all data to original sources, providing a chain of evidence to confirm judgements (Mertens, 2005).

Some theorists have the view that narratives are reflections *on* the known world, rather than *of* the known world and, as thus, objectivity is not its purpose (Coulter & Smith, 2007; Denzin & Lincoln, 2000). Coulter and Smith (2007) argue that in narrative research it is the particularity of the narrative that is significant and thus, negates the need to apply generalizability (Chase, 2005). It is the pursuit of “particular rather than general understandings of phenomena” (Coulter & Smith, 2009, p. 588) that is sought and this can only be achieved through placing the narratives in a broader societal context that either constrains or enables the narrative (Chase, 2005). Rather than being generalizable to a population, narrative studies are generalizable to the case.

In this study multiple sources of data were collected through mediated interviews, participant learning story journals, work samples, photographic and video data, and researcher journal. Multiple sources of data collection were used to minimise researcher subjectivity. Further, care was taken to ensure that all data could be traced back to the source of origin and thus confirmation of any aspects of the individual narratives could be made. In addition, it is the particular, rather than the general that is desired and joint confirmation of the narrative was used.

3.7.2 Credibility / Trustworthiness

In narrative inquiry the co-construction of rich narrative text between researcher and participant raises issues relating to trustworthiness. Narrative researchers essentially seek to persuade, and in doing so understanding meaning is central to the construction of the research text (Riessman, 2008). It is argued that the validity or credibility of a narrative “can be strengthened if the analytic story the investigator constructs links pieces of the data and renders them meaningful and coherent theoretically” (Riessman, 2008, p. 191). In other words, for the audience to be persuaded, it is important that plausible interpretations stem from authentic data. Some ways that this has been achieved in the present study is through checking with participants that viewpoints are accurately represented and through the keeping of a researcher journal which fostered researcher reflexivity and ongoing methodological and critical awareness. Co-confirmation of the narrative also ensured that meaning was clear. In the present study a researcher reflective journal was kept at all times throughout the study and used for self-reflexivity. Validity or truth were also sought using Riessman’s (2008) strategy where claims were supported through a trail of evidence that was uncovered as each narrative unfolded. In this study care was taken to ensure that all data could be traced back to the source of origin and thus confirmation individual narratives could be made.

A further issue relating to trustworthiness is highlighted by Gordon et al. (2007) who stress that “narrative inquiry is the product of dialogical and polylogical exchange with the world” (p. 349).

Whilst they emphasise that there is a place for inquiry that values the use of dialogue and multiple stories for cultivating a rich understanding of the phenomenon, issues concerning the trustworthiness of co-constructed narrative arise. Some ways in which credibility or trustworthiness of the participant viewpoint as portrayed by the researcher can be improved are through prolonged engagement in the field to build trust and check distortion (Connelly & Clandinin, 2006; Riessman, 2008), persistent observation, member checks for congruence, clarifying researcher bias, triangulation or multiple sources of data collection and rich thick description (Creswell, 2007). Procedures were implemented in this study to increase the trustworthiness of viewpoints in the following ways: firstly, prior to the commencement of data collection, the researcher made weekly visits and spent time in each learning environment, in order to build trust and establish strong relationships with participants. This relationship was maintained throughout the study and continued after the data collection period ceased. This was achieved through regular visits by the researcher to the learning environment, teaching support outside of the research focus and dialogue with other members of the learning community such as the principal and support staff. Regular contact with participants in this way provided opportunity for careful observation and ample opportunity to check for distortion in the unfolding narrative. The issue of trustworthiness was further addressed through the use of member checks.

Participants were provided with summarised data to check and confirm that participant-narrator voice in the restoried narrative was accurately portrayed and any revisions through this process were honoured. As is the case with narrative studies, in this study the collaborative nature of narrative text construction (Coulter & Smith, 2009; Montero & Washington, 2011;) contributed to the trustworthiness of the research text as participants were actively involved in the construction of the narrative aimed at presenting story truth rather than literal truth (Coulter & Smith, 2009). Furthermore, thick descriptions incorporating multiple sources of data collection were embedded in the narratives to provide the reader with rich information to increase the trustworthiness of the study.

Semi-structured and unstructured interviews were used in this study and the role of the researcher as a listener was highlighted. To increase credibility and trustworthiness semi-structured interviews were piloted with educators who were not a part of the study before being implemented with early years educators as noted earlier in this chapter.

3.7.3 Transferability, Reliability

Transferability relates to external validity. A criticism of case study and narrative research in general, is that results are limited to the case under study. However, in “case study the emphasis is on the characteristics of the particular case; therefore external validity is not of great importance” (Burns, 2000, p. 71). What is considered to be of importance is ‘transferability’ or the extent in which the results can be transferred to other settings (Creswell, 1998). “Rich, thick description allows the reader to make decisions regarding transferability” (Creswell, 1998, p. 203) or the extent to which the study

applies to another situation. Montero and Washington (2011) further claim that transferability in narrative studies is of a more personal nature where transferability is measured through feedback from the reader about how the narrative informed reader understanding of the phenomenon or human experience under study. This is achieved when readers can make connections between their own experiences and particular elements of the study (Montero & Washington, 2011). This point is further supported by Burns (2000) who argues that “clean data sanitised by control in experimental techniques are not true to life” (p. 475) and by embedding historical, social, personal and other contexts into the study transferability can be applied by readers through naturalistic generalisation. In order to maximise this in the present study, “richly textured” (Montero & Washington 2011, p. 332) descriptions of early years educator experiences of the symbiosis of literacy and technology in their learning environments were presented.

Reliability refers to the replicability of the research but in case studies dependability is used to describe the extent in which “the results make sense and are agreed upon by all concerned” (Burns, 2000, p. 475). Some ways in which issues relating to dependability have been considered in the present study include the recommended processes of clear steps for data collection which can be replicated using multiple sources of data, and reporting on researcher bias and an audit trail (Burns, 2000; Creswell, 1998).

In the present study other limitations relating to dependability of the research study were also addressed. Lichtman (2006) highlights “consideration of subjectivity and bias” (p.196). A researcher reflective journal was kept at all times throughout the study and used for self-reflectivity to clarify researcher bias. Furthermore, documentation of all activities, involvement and observations, and a detailed account of how the study was carried out were incorporated into the narrative. This detailed information could be used to establish the audit trail to increase dependability and transferability of findings.

Whilst documentation of activities, observations and involvement assists to establish dependability and confirmability, it is through rich descriptions that transferability can be established. Transferability in narrative research refers to connections that readers can make between their own experiences and particular elements of the study (Montero & Washington, 2011). In order to maximise this in the present study, “richly textured” (Montero & Washington, p.332) descriptions of early years educator experiences of the relationship between literacy and technology in their learning environments were presented.

3.7.4 Time

Several boundaries were placed on the present study to ensure manageability. The time consuming nature of narrative studies demands a containable scope (Montero & Washington, 2011). In the present study only two learning environments were examined in regional Victoria, with a travelling distance of less than thirty minutes for the researcher. This strategic choice of learning

environments ensured regular contact could be maintained with early years educators. Semi-structured interviews were conducted at the beginning, during and end of the study with a one hour constraint imposed. The one hour duration allowed for individual stories to be collected and time for rich dialogue, but also acknowledged the business of school and kindergarten life.

The present study was conducted over two terms. The strategic placement of the study across term three and four aimed to provide time for early years educators and children to be well accustomed to routines and relationships in the classroom before data collection commenced and to provide the researcher with time to establish a rapport with participants before collecting stories. A boundary for two terms was set for the study to ensure that there was enough time provided in the study to capture rich data and for patterns and themes to emerge in a natural setting, but not so much time that the study became difficult to manage and commit to by the early years educators. The boundaries described were necessary to ensure manageability of the present study whilst providing scope for rich data collection.

3.8 Ethical considerations

A number of considerations were taken into account in the design of the research in order to ensure the ethical conduct of the study. Ethical considerations were mainly concerned with involvement of early years educators and children in the learning environments under study. Ethics approval was granted from the university Standing Committee on Human Ethics in Research (Registration number V200708 54), the Kindergarten Board of Management and from the Catholic Education Office in the appropriate diocese and the study was conducted according to approved ethical guidelines. Under this regime informed consent was sought and received from all involved in the study. Early years educators involvement was voluntary and all children involved in the study had signed consent from parents. As part of this process a letter was sent to parents outlining the study. Data was only collected from, or about, children with signed parental consent. The identity of all participants (children and educators) has been protected in the reporting of the results of this study and the names of the participating school, kindergarten and participants have been changed to ensure anonymity.

A further ethical concern to be addressed related to the range of data collected. In order to secure these data all information pertaining to the study: paper information, photographs and recordings, have been kept and will remain in a locked filing cabinet in the researcher's office for the mandatory period before destruction according to Ethics Committee guidelines. Riessman (2008) highlights that the use of digitised images can complicate the ethics process. However, given the same care and attention required for other digital material, ethical considerations can be met. In the present study any digital information such as photographs, audio recordings and interview transcripts, has been password protected on the computer and identifying factors removed in any artefacts used in the thesis.

The use of digital data prompts other ethical issues surrounding participant right of review. The right of review extends to use of interview transcripts, photographic material and work samples used in this study. Walsh et al. (2007) caution that ethical issues surrounding the trustworthiness of the use of digital photographs are no more or less an ethical issue than the trustworthiness of interview transcripts. In the present study member checks were used to address issues relating to trustworthiness of images and the right of review has been respected by providing copies of interview transcripts, work samples and digital photographs to the early years educators to validate authenticity and interpretation.

3.9 Summary

In summary, this chapter has detailed both the theoretical foundations and practical processes and instruments used in gathering the data and documenting the stories of early years educators' experiences of technology and literacy in early years education. The following chapters relate the stories of the educators and the researcher in exploring the relationship between technology and literacy in early years education.

CHAPTER 4

SUSIE'S STORY

The Lived Experiences of Literacy and Technology

'What we want to see is the child in pursuit of knowledge, and not knowledge in pursuit of the child.'

George Bernard Shaw

4.1 Introduction

Chapters 4 and 5 present the stories of each participant's lived experience of the application of technology to the literacy context of their individual learning environments. The data collection tool of case study was used to capture the lived experience and qualitative data collection methods in the form of interviews, learning story journals (LSJs), photographic data, work samples and the researcher journal were used to document each story and construct each participant story. Key themes identified in each participant story were then analysed to provide rich information to inform the research question, *'What are early years educators experiences of technology and literacy in early years learning environments?'*

Pseudonyms were used for all participants throughout each narrative. The stories seek to provide insight into the ways that Mollie and Susie interwove technology into their respective programs and in turn, mediated the children's experiences with technology in the literacy context. The following scaffold questions were devised to explore the overarching question, *What are early years educators experiences of technology and literacy in early years learning environments?* These are:

1. What are the beliefs, understandings and assumptions about literacy, technology and practices that early years educators bring to the early learning environment?
2. How do early years educators interweave and mediate technology and literacy use by children in the early years of education?

These scaffold questions have framed each educator's story. In keeping with a narrative methodological framework the three elements of temporality, sociality and place are given respective consideration within each educator story. In the re-storying process the narrative data has been storied into a chronological series of events. In keeping with thematic approaches to analysing narratives extensive references to quotations have been integrated throughout each story in order to show emerging themes as part of the whole story. The final narrative for each participant is a composition from a range of data sources in which underlying themes have been highlighted within the chronological structure of the story.

Each story begins with a description of the learning environment or context. This is followed by the chronological telling of the lived experience of educators as they explored the application of technology to the literacy context in the changing life space of their early learning environment. Each story contains a series of chapters that are marked by key activities throughout the data collection period. These minor chapters begin with the initial interview and continue to be determined by key events that in turn mediated the children's learning experiences with technology in the literacy context.

As described in Chapter 3 each educator's story commenced with an interview to identify beliefs, understandings and assumptions about literacy, technology and practices in the early years of learning. From this, an intervention for professional learning emerged. The intervention used an action-reflection cycle that began with the generation of ideas and identification of learning needs for the children and the educators. A range of learning experiences applying technology to the literacy context were implemented and then reflected on and evaluated. This cycle was repeated twice with each educator to align with the school and kindergarten terms, and informal reflections and evaluations were ongoing throughout the process.

A series of 5 interviews was conducted throughout the data collection period. After the initial interview a further interview was conducted mid-way through each action-reflection cycle and at the end of each action-reflection cycle with each early years educator. The following coding was used for identification of data used in each of the narratives:

- Example 1: Susie I1B, p.3 refers to Susie, Initial Interview, Part B, Page 3,
- Example 2: Mollie C3, p.3 refers to Mollie, Cycle Interview Three, Page 3,
- Example 3: Pete F2b, p.5 refers to Pete, Final Interview Two, Page 5,
- Example 4: Susie LSJ2, p.2 refers to Susie, Learning Story Journal Two, Page 2.

4.2 Susie's Learning Environment

Susie was a Master's degree qualified and experienced kindergarten teacher who was in her eighth year of teaching at Centenary Kindergarten at the time of the study. She taught the four year old kindergarten groups and was also the Director of the kindergarten. At the time of the study the four year old groups at Susie's kindergarten were at capacity and as such there were no new enrolments or transfers throughout the data collection period. Figure 4.1 provides a picture of the dimensions of the learning environment.

FIGURE 4.1

A Snapshot of Centenary Kindergarten



Susie

- Experienced kindergarten teacher with over 16 years teaching experience
- Masters of Education Early Childhood
- Eighth year at Centenary (Pseudonym) Kindergarten

Staff

- 1 Kindergarten Director/ Teacher four year old groups (Susie)
- 1 Kindergarten Assistant for the four year old groups (Jill)
- 1 Kindergarten Teacher for the three year old groups
- 1 Kindergarten Assistant for the three year old groups

Four year old groups

- 2 four year old kindergarten groups
- 2 three hour sessions and 1 four hour sessions per week
- 2 three hours sessions and 1 four hour session per week
- Total 10 hours per week

Three year old groups

- 2 three year old kindergarten groups
- Once or twice a week

General information

- Transition to school program in final term of the year for four year old group
- Middle to high socio-economic area of regional city
- Kindergarten run by Uniting Care
- Demograph from the immediate and broader community
- Demand for places strong
- Kindergarten group sizes at capacity

The Kindergarten Program

Susie implemented a play-based curriculum at the kindergarten and followed the interests of the children when planning learning experiences. She planned for play-literacy experiences to be integrated across the curriculum. Children were involved in indoor and outdoor play in every session

and the play experiences ranged from teacher directed play, to child initiated play in areas such as, dramatic & imaginative play, sensory exploration (water & sand play), construction (blocks & building), performing arts and creative arts. In the kindergarten room there were a range of different play and learning areas including a wet area, home corner, science area, cutting and pasting area and a whole class area. Of particular interest outdoors was the theatrette used by the children for their own performances. Indoors there was a writing table with a range of writing materials, utensils and a post box nearby. There was also a reading area that contained a bookshelf with a range of books in different shapes and sizes, a couch big enough for an adult and child to sit comfortably and a brightly coloured mosquito net gently draped from the ceiling and over the couch. There was a notebook computer situated on a table in another area of the room, and the home corner contained a basket of mobile phones.

Susie planned her kindergarten program on a fortnightly basis. She used her observations of the children's needs and interests as well as her knowledge of child development to plan for a range of learning experiences. Susie reported to parents on children's progress using a combination of a portfolio assessment and term summaries. Portfolios were developed for each child and contained work samples and photographs that highlighted individual learning throughout the year. Each term Susie sent home to the parents a summary of how each child was progressing and asked for the parents to reply with their own feedback on their children's learning. The children's portfolios were always a work in progress and Susie added to these throughout the year. The portfolios were accessible in the room for parents to look at during the year and they were sent home with children at the end of the year.

4.3 The Initial Interview

4.3.1 Susie's Beliefs, Understandings and Assumptions about Technology and Literacy Practices

From Susie's initial interviews prior to commencing the first action-reflection cycle the items in Table 4.1 were identified as particular entities relating to her beliefs and assumptions about technology and literacy practices. These beliefs and assumptions are presented in further detail in the following section.

4.3.2 Literacy Beliefs and Assumptions

In the initial interview Susie's comments reflected a range of beliefs and assumptions about technology and literacy practices. Of particular interest was Susie's view of literacy. Susie described an holistic view of literacy in which being literate was about meaning making:

...understanding that there's a meaning behind those symbols those squiggles that they're not sure what they mean... to be literate is to be able to read and write and understand the meaning behind it all. (SusieI1B, p. 3)

It is letting the children know that literacy isn't just one thing where you sit down and read and write. It is part of everything that you do. It's the pre-literacy skills and the meaning behind it all... (SusieI1B, p. 3)

I think the underlying thing is with literacy there's the meaning behind the symbols, behind the words and with technology it's the meaning behind why you use it, what's the use for it, so there are similarities there ... (SusieI1B, p. 8)

TABLE 4.1

Overview of Susie's Beliefs and Assumptions about Technology and Literacy Practices drawn from the Initial Interview

Beliefs, and Assumptions about Technology and Literacy Practices (Susie)
1. literacy learning should be purposeful and developed in meaningful contexts
2. technology is a key enabler of literacy learning
3. children should be active participants in learning
4. children learn about literacy in integrated ways
5. children learn in communities of collaboration
6. children's literacy learning experiences at home and outside of formal education settings are important
7. teachers should demonstrate a passion for literacy education
8. literacy learning is about meaning making
9. it is important to provide scaffolds for children's literacy learning
10. children learn literacy through modelling and demonstration
11. children learn literacy through using approximations and practice, and by making mistakes
12. children's literacy learning occurs at different rates and in different ways
13. literacy is about communication
14. children should be immersed in a rich literacy learning environment
15. classroom routines are important for learning and/or clear expectations support literacy learning
16. children learn literacy through interactions and problem solving with others
17. children learn literacy through following their interests
18. children should be given some responsibility for their learning
19. children learn to use technology by watching teachers use it
20. technology and literacy learning occurs through play and exploration
21. technology can be social rather than solitary
22. children should be given some choice and flexibility in the direction and focus of their learning

During the interview Susie indicated that she was referring to paper-based literacy and her belief that being literate was about gaining meaning from print. However, as the interview progressed it was evident that Susie's view of literacy extended beyond the boundaries of print. Furthermore, her teaching practice reflected an holistic and integrated view as illustrated through her description of the way she develops language and literacy in the kindergarten:

...I set up the program so that there's literacy everywhere. There's posters there's all the materials available pencils, texts, books and also activities we reflect on, excursions we have been on. We make up our own stories, writing down a lot of things at group time to actually show them. Like when someone's missed out on

‘show and tell,’ even just little things like writing their name down so that I don’t forget - well for my memory as well, but also so there is a reason behind writing names. It’s not just a sticker up there to look pretty; it’s to remind me of something - so the reason behind the literacy. (SusieI1B, p. 5)

Susie’s description of classroom practice identified an arrangement where literacy resources are not confined to one area of the room and where literacy learning can occur throughout the session within a meaningful context. Susie described literacy as incorporated into learning experiences throughout the day. It can also be noted that the explicit value Susie placed on the meaning making aspect of literacy was evident in her descriptions of learning experiences in the classroom.

We have had some amazing banners made up where I have just written things on a small piece of paper, and they’ll make their shop banners or their hospital banners. Just last term when we had our art gallery. When we were setting it all up we decided, ‘*well while we’re setting it up the parents aren’t allowed to have a look,*’ so they [the children] made up these big signs, ‘*No parents Allowed*’. They [the children] loved making those. The big ‘*NO*’. They [the children] know how to write it, how to say it and what it means. So it’s having a meaning behind it. It’s not just up there because Susie’s decided to write it there’s a reason behind it. (SusieI1B, p. 4)

In the example above the children’s literacy learning stemmed from a need to create a message for parents to ensure their display was a surprise. The meaning making was in the need to communicate an important message in a way that the intended audience could understand.

4.3.3 Technology Beliefs and Assumptions

Susie described technology as “anything that requires batteries: computers, cameras, and has an on and off button. It is used as a communication tool” (SusieI1B, p. 5). It was this affinity with the communicative aspect of technology that was evident in Susie’s descriptions of learning through play in the home corner of the classroom:

I put in a remote control in first term and I just had it in one of the drawers, and the children found it. Of course they knew it was a remote control but they didn’t have a TV, so some were pretending they were pressing it to the wall. Then another group decided that we actually need a TV so they went to the pasting table and actually made themselves a TV, so they were talking about where the numbers go and what buttons they’ve got. And then they came back and they set it all up, and they watched a few programs and then it all of a sudden it didn’t work. So then they had to find the phone [basket of display model mobile phones] to ring the electrician. They also had to find the phone book. We always have a phone book in there, so they were looking up the numbers and then when the electricians came they fixed it all up. But then they had their note pads and their paper and they wrote out the bills for them as well. So it was all this literacy that was happening just from what was available...It was just amazing. There were no words written on the paper but they knew exactly what it meant and how much they were going to charge, and of course it broke down again so they had to ring them again. That was a whole session but then it continued for a couple of weeks. They kept bringing it back to the pasting table and adding more to it and fixing things up and adding a power cord and all these amazing things and that was just purely from putting a remote in the home corner. (SusieI1B, p. 2)

Susie’s description of technology as having an ‘on’ and ‘off’ button or requiring batteries can be identified in her example of children’s play with the television, and was integral to the

communicative process that the children engaged in through play. In Susie's description of the learning experience the children were engaged in meaning making through the connections that were being made between their daily life experiences and the social practices; watching their favourite programs on television, the television not working, phoning the electrician for assistance and paying the bill, as they experimented with associated literacy purposes and meanings.

The qualities of communication and meaning making through play with technology offered for literacy learning were further captured in another learning episode where new technology was integrated into the children's imaginary play:

...it is part of the children's world. It's not an added extra, something different; it's just part of their everyday life. I can still remember when the children stopped using the cash register pressing the numbers and starting scanning it was just a sign of the technology. They're used to scanners, whereas when we were younger it was always pressing the buttons because that's what we grew up with. So a lot of what their play is here at Kinder is reflective of what they know and what's in their life and technology is a huge part of it. (SusieI1B, p. 7)

In the preceding example Susie placed value on the opportunity that play experience gave the children to explore technology and literacy use; the transaction process involved in purchasing groceries, conventions; the way in which the transaction is carried out, meanings; the understandings associated with the purchase of groceries, and purpose; to purchase groceries at the supermarket. Susie noted in the interview that in her observations technology was part of the children's lives and through integrating technology into the kindergarten program it could become a source of further learning and expression of ideas and understandings for the children through the role playing of authentic social interaction. The rich description of Susie's observations of children's play highlights the way in which Susie values children's play experiences as a means of reflecting their understandings of popular culture and technology through experimentation with social practices; using technology in the *contemporary* way to purchase grocery items at the supermarket, and the literacy learning, particularly in the form of communication, that comes from this:

...having technology for pretend play, like we've got pretend phones, pretend cameras that children use, everyday things in their imaginary play. It doesn't necessarily have to work but the children know what they're all about and use it in their pretend play. (SusieI1B, p. 6)

When asked about how technology should be used in the kindergarten program Susie made links to her integrated approach to literacy and alluded to, but did not fully articulate, an understanding of a relationship between the two:

I think that it [technology] should be like literacy, be part of the whole program, not just this is the computer corner this is where technology is and that's where it stops. It needs to be involved in everything but not overtaking it, not relying on it because it doesn't work all the time. It should be part of everything that we do and be available for the children that are interested in it but not pushed on those that aren't. But I have to admit there are not many who aren't [interested in it]. Actually I haven't come across a child who is not interested in it. (SusieI1B, p. 8)

Susie's reference to technology needing to be a part of the whole program without overtaking it demonstrated a strong belief in a program where literacy and technology experiences and learning opportunities are embedded and balanced. Susie believed her perspective was also relevant in the primary school where technology could further enable literacy learning through building on the experiences of children in the kindergarten:

I think it [technology] also strengthens a lot of literacy things because children that aren't confident in writing and are more confident in using a keyboard because it is part of what they're used to doing. [I'm] not saying that writing is not important and they do need to still learn those skills but having the keyboard to type things out can also raise their confidence and move on to the writing part. But that doesn't so much happen in Kinder that's more I'm presuming may happen at school with some children. A lot of the stuff we do with technology is, as I said, the word processing, the writing, the use of photos in technology which is like telling a story with the pictures. (SusieI1B, p. 8)

Susie described literacy in terms of meaning making and technology as a communication tool. For Susie, the relationship between technology and literacy seen this way had strong social associations. In particular Susie identified goals for language learning to be developed through immersion and practice in a social context:

...it's the goal of having confidence to continue to use their language even if they can't be understood; to have a go at it, because some children who can't be understood will often stand back and say, *'Well I'm not going to try because I've failed at it'*. So it's continually building up their confidence. But in regards to language overall, yes, for them to have the confidence in using it, to know the time and place of when to use it. That's always a fun one at *'nap time'*. (Susie I1B, p. 4)

Susie's reference to the use of language at 'nap time' illustrated her belief that children need to use language in social contexts even if it is to learn whether or not the use is appropriate. In her use of 'naptime' as an example Susie was referring to children learning that this is a time of rest for bodies and voices, and not an appropriate context for conversation. In a similar way Susie noted a social context for learning with technology:

...I feel that with technology children are learning with each other and with themselves... (SusieI1B, p. 6)

Some people are worried that computers are the big evil because it [the computer] is a solitary thing, whereas we try to make it [the computer] a social thing where they work together on it. (SusieI1B, p. 6)

Susie acknowledged that in her classroom the children did not always choose to interact with technology in a social way, however she did not indicate that she had acted upon this observation beyond providing access to technology resources for solitary play:

...the MP3 player where the children use that for quiet time listening to stories on their own if they want to, the computer which we also have a timer on because some children will sit there all day and not interact with others. (SusieI1B, p. 6)

4.3.4 Pedagogy

While Susie's awareness of a strong social context for literacy and technology had been reinforced through her observations of children's pretend play, it would seem that Susie had not fully capitalised on the breadth of potential of technology for literacy learning, and viewed books as the key tool for literacy:

...and when it comes to literacy you need to have that in all areas of the room not just at the writing table, or just having books at the book corner. Sometimes we have them [books] on the mat with the blocks, sometimes we have them [books] in the music, last term we had make believe in there [music area] as well so there were magic books in there. (SusieI1B, p. 3)

Similarly, in her learning environment, the notebook computer was set up in the 'technology corner' with a program for children to use loaded on it.

...we have a computer that the children have open access to but there is only one program I have on there and I think is called Shapes, Letters and Sounds or something. (SusieI1B, p. 6)

The technology set up, it would seem though, did not allow for the same spontaneity and integrated learning that was evident with the placement of paper - based literacy resources in the classroom.

Susie strongly believed in the importance of children having access to literacy resources when and where they were required:

... I always have paper and pens available, in the home corner just having the phone book, just having those things there for them that they can use in their play. Whereas if I had them, we do have a writing table, but if I had it all just there it wouldn't come into any other part of their play because they'd have to go and get it. Or, if it was going to stay there they wouldn't be able to use it in that part of play because, *'no that's not where we are at the moment'*. (SusieI1B, p. 2)

In her program Susie described a learning environment where children were provided access to literacy resources through immersion in a rich literacy environment:

...the way that I set up the program so that there's literacy everywhere. There's posters, there's all the materials available pencils, texts, books and also activities we reflect on, excursions we have been on. (SusieI1B, p. 5)

Susie articulated a similar vision for children's access to the technology resources in the classroom:

...I've just bought a new printer to add with our computer where the children will be able to print things out straight away, [they] won't have to come into the office or anything like that. This is what I am hoping, they'll have to access to be able to go and do it themselves. (SusieI1B, p. 7)

It was apparent throughout the initial interview that Susie's approach to learning was child centred. At the beginning of the interview when asked about what she felt most passionate about in her teaching Susie responded:

The interactions with the children and being part of the program with them rather than setting it up and just letting them go for it, but then also I find it I've got to make myself stand back sometimes because if I come in it interrupts the children and what they are doing and they focus on you, whereas if I take that step back the interactions that go on between the children themselves. So that comes back to the curriculum the way you have set it up and the interactions. It is hard. Do you go in and be part of the program? When do you stand out and let the children take control of the program? It is a real fine line to know. (SusieI1B, p. 1)

Susie placed emphasis on the interactions with the children and the way in which listening to and observing the children informed her classroom practice and in particular, what she did as an early years educator; the way in which she planned for learning to occur and to what extent as the teacher she intervened in the learning opportunity. Susie described her classroom practice as supporting her belief in the children's interaction through children being given responsibility for their learning and teachers having clear expectations and routines in place that ensure that children are supported to be responsible for their learning:

Some children I know learn through having a definite routine, they know what is coming next, and then others are more spontaneous. They like to change things around so it's being able to fit that spontaneity in a structured routine and program. For instance, the room, every term I actually change the room around. I do have some things that are familiar but I also change other things around so other children will go and explore them, but I let the children know where everything is so that those that need the security of knowing what's happening and where things are they've got that opportunity to find out, they're not just thrown in the deep end. So it's not just the activities that you set out, it's also the way that you interact with the children the routines that you have all that kind of stuff. (SusieI1B, p. 2)

In this example Susie placed importance on her interactions with the children in setting up routines and expectations whilst still providing scope for the children to carry out their own explorations and initiate control over the learning process. In order to set up a classroom in this way good organisation was of paramount importance:

I am a bit of a stickler sometimes, a bit too organised in some ways. I have- everything has its place and the children know exactly where everything goes because Jill [pseudonym] and I are really meticulous at putting it all back into the same place. Whereas if it was, 'Oh well in fits there today, tomorrow we will have it somewhere else,' I think that would really interrupt their play because they don't know where things are when they want them, and having all of the like, just pencils, paper, all those things available they can use them straight away... I think it has a real influence on how they use it... (SusieI1B, p. 2)

Good organisation went hand in hand with establishing clear routines and expectations in ensuring that children have access to the resources they need to exercise some direction or control over their own learning:

...some [children] need to know what is expected of them, what they have to do. They can't just go in and do it themselves. They're so used to having everything explained to them, or the way that they think is they have to have an end product so they want to know the steps of how to get there. (Susie I1B, p. 1)

It would seem that child-centred teaching practice was essential in Susie's learning program for the creation of an effective learning environment. Susie did not see these characteristics alone as providing for an effective learning environment. Susie was aware that children enter formal education with a variety of learning needs and these also needed to be catered for in the delivery of a child-centred curriculum

During the initial interview Susie articulated that she believed that children best learn through "hands on experience" (SusieI1B, p. 1). Susie further articulated a strong belief that children have different learning styles that need to be catered for in the classroom, and that these learning styles are best catered for through children actively participating in learning:

... it is having a mixture of different things for the children so they can go through the avenues which best suit them. It is like all the different learning styles - the visual the audio, [pause]. So it's having all those different things available so the children do have the opportunity follow what suits them best. (SusieI1B, p. 1)

This point of view was further elaborated when asked about her goals for the children. Susie highlighted that although the goals may stay the same the dynamic pathways taken to achieve the goals may differ from year to year, and child to child, in line with her belief that children learn in different ways:

Overall I don't think they [goals] change from year to year but the way I approach them does change according to the children that I've got.... So knowing the children and the concentration span, the goals are basically the same but the way I go about achieving them is a bit different. (SusieI1B, p. 4)

Susie provided an example from her classroom practice which demonstrates how this belief is put into practice in her classroom:

The walls out there, we actually sat down at group time and worked out this is our excursion to Smith's Hill. So we were working out what we will write down to tell the mums and dads about the pictures. Well, Group A we had to fast track because they lost interest after a short while, whereas Group B we could have sat there for over a half an hour and just kept going, but one or two said, 'I'm starting to get hungry,' so we thought we might need a snack. (SusieI1B, p. 4)

Further evidence of Susie's belief that children have different learning styles can be noted in the way that she described how her key literacy beliefs underpinned her teaching particularly in her efforts to provide scaffolds for the literacy learning so that children experience success:

I often find in fourth term a lot of children actually ask me to write things for them, and I'll ask, 'Well would you like me to write it then you can copy it?' And a lot like to do that. So I'll write it on one piece of paper and they'll copy what they can. Whereas others say, 'No, you write it,' because they haven't got the confidence in doing that yet. (SusieI1B, p. 4)

Through providing support in the form of scaffolding those children who wanted to copy a model and do their own writing were able to do so and others who were not confident to do this were still able to be involved.

One of the strongest held beliefs which Susie articulated in the initial interview was the importance of providing authentic and purposeful learning experiences as contexts for children's literacy learning. For Susie, authentic and purposeful learning was connected to the children's meaning making experiences and her efforts to provide a child-centred curriculum: "literacy is everywhere it's not just when you are at the writing table when you're at the books, so it is all around us, the meaning behind it, creating an interest in it" (SusieI1B, p. 4). In her descriptions of classroom interactions; the sign for parents, the names for 'show and tell,' the play in the home corner with remote controls, phone books and mobile phones, each reflected the high importance Susie placed on learning being purposeful and relevant to the children. In particular Susie identified student interest as a key factor in meaningful learning. When asked to describe why she thought the integrated play experience with the remote control, phone book, mobile phone and other literacy resources was so successful, Susie indicated that she believed it was due to the children's familiarity with each other, access to resources and being encouraged to follow their interests:

"...the children were familiar with each other and they were also familiar with all the equipment that was available to them and because it was available to them when the interest was there they knew where to go, where to get things and how to use it in their play." (SusieI1B, p. 2)

Susie noted that a key goal for literacy and language in the kindergarten was: "...just to extend their interest in it [literacy and language]" (SusieI1B, p. 4). She also noted in her practice that she sought to extend on children's interests:

I think the photography [digital] in their art work, because we were going through different art mediums and one of them was photography [digital], so they were allowed to use the camera [digital] and take a photo to add with all their other artwork, and when it came to doing their artist profile I was asking them, 'What was your favourite art medium?' and I actually went through and said that there's pasting, there's drawing, there's clay sculpture, there's photography [digital], there was one other but I can't remember which one it was, and the amount of children that actually said photography[digital], and yet that was the one we spent the least amount of time focused on, so it was amazing. I would say that more than half actually said photography [digital] was their favourite. I was like, 'Oh, we'll have to extend on this'. (SusieI1B, p. 6)

In this example from her practice Susie identified student preference for using the digital camera as an important reason for extending its use. Susie went on to note that the camera was something that she entrusted to the children; the children were given responsibility for it, and this was something that many of them had not experienced at home: "they were allowed to use the camera so it was something they don't normally have" (SusieI1B, p. 7).

Through Susie's descriptions of the children's kindergarten experiences it was evident that she valued the learning experiences from home and outside of kindergarten that children brought with them to their learning. Susie scaffolded and extended children's literacy enriched play experiences which connected life experiences and social practice. The cameo of the remote control and mobile phone play activity previously described where access to resources *when* and *where* they were needed

enabled the episodic nature of the learning experience to evolve which illustrates this scaffolding and extension. Susie also showed that she valued and made connections to learning that occurred outside of the kindergarten in her descriptions of episodes:

I do have some children that when they finish Kinder they do know how to write not a lot, and I have had some that can actually read, and that's not from sitting down and teaching them this is A, this is B. This is what they have picked up through the whole program and also at home, and often they've got other brothers and sisters who read with them from school... (SusieI1B, p. 3)

In another description Susie described some conflicts between home and kindergarten environments, for example with the kinds of letter knowledge that children bring to kindergarten from home and with trying to find ways to get parents to change their behaviours:

...when children first come in [to kindergarten] and when we're writing their names on things I use the cursive script that they're going to use when they go to school, and doing the J for Jack, or any J name, I don't know how many children get frustrated with me because I haven't put the line across the top. I actually had out at the writing table all the letters so that they could see, but the amount of children that say, '*No that's not how you do it*'. I also put it out for parents because often parents are writing their names in capitals, so for teaching them that the capital is for the first and then the rest are the small letters hasn't really caught on with a lot of parents and I am not sure how to go further because quite often that's the way they write. Some do catch on to it but we still have quite a few that will write their names in capitals because that's what mum and dad do. It's not just the literacy with the children it's also the literacy with the parents as well. (SusieI1B, p.3)

This example highlights for Susie the importance of a partnership between home and kindergarten.

Susie continued to describe good modelling as being at the core of assimilation for learning in both contexts:

Parents are used to doing it that way and with any new knowledge that comes in it takes time to assimilate it and actually break the habit and have a new habit start. I think it could be something with that and I have to admit that I do the cursive when I am writing the children's names or any stories but when we're making up displays for around the room I try to use different fonts so that there isn't just one way for writing. There's other ways that it can be done as well. (SusieI1B, p. 3)

In this way Susie demonstrated sensitivity to the tensions that can exist between learning in and out of kindergarten whilst still acknowledging the prior knowledge brought to the core literacy learning experience.

4.3.5 Technology in the Learning Environment

The initial interview revealed that Susie had a strong interest in technology and was confident and competent to use it in her program:

I am really interested in technology myself. Some of my friends call me 'Gadget Girl' because if there is a new gadget out I've got it. It's something that I understand, I'm comfortable with and I also know it is part of the children's world. To them it is just normal so I use a lot of technology in my program as well. (SusieI1A, p. 1)

Susie did not define her confidence with technology in terms of expertise but rather in terms of having a self-perceived interest in exploring technology:

I'm confident in that if there's anything new in technology I don't have to read the manual. I'll just play around with it and I can figure out what I need to know, and then if all else fails I can revert to the manual. I learn more from fiddling around and finding out myself how things work and because, as I said before, some of my friends call me 'Gadget Girl' because I like getting all the latest things and playing round with them and all that. It is just part of my everyday life, just like the children. (SusieI1B, p. 5)

The playful way in which Susie described learning how to use technology connected what she saw as her experiences with technology and the children's experiences with technology in everyday life. In response to the question, '*What do you feel are your strengths when it comes to using technology?*' Susie described her playful and exploratory approach to using technology as a key strength in her pedagogy through providing the confidence to persevere when the technology didn't work and to then learn from the experience:

I suppose the confidence in using it [technology]. The confidence in, if it [technology] doesn't work, it doesn't matter, I can try and figure out a way to fix it, although sometimes I feel like throwing the computer out the window when it doesn't work. It can get frustrating but I think probably the confidence in having a go at using it... (SusieI1B, p. 5)

It was of some concern to Susie that other educators that she knew chose not to use technology in their classrooms because they lacked confidence in using technology and being mediators of technology in the classroom so chose not to offer learning opportunities with technology to the children:

... I know some other teachers who haven't grown up with it like I have, they're really wary of it and won't use it in the room because they haven't got the confidence, therefore they haven't got the confidence in using it with the children. (SusieI1B, p. 5)

For Susie, teacher professional learning in technology, particularly for kindergarten teachers, was important but she described her needs for professional learning in terms of gaining support to develop a pedagogical approach for using technology in the kindergarten program:

It is really hard to find good professional development and there is not a lot on technology. I think the ones I have seen are basically for those that have no understanding of technology so it's the very basics. It is not like how you can use it with the children it is more how you can use it in your programming or in the Kinder yourself. (SusieI1B, p. 1)

In an example from her own classroom practice Susie described how she saw children learning with technology and the implications this had for her professional learning. Susie provided this response to the question, '*Are there any areas of professional learning with technology that you would like to pursue?*'

I suppose some of the software that's available for children to use, because we have a computer that the children have open access to but there is only one program - I have

on there, and I think is called 'Shapes, Letters and Sounds'. It's a very basic one but I find that we don't have to change it because there are so many different things the children can learn in there and also they need to repeat as well. But I'd like to know what other software is available and the use of it... (SusieI1B, p. 6)

For Susie, professional learning needed to be about exploiting the potential of technology for learning in the exploratory play environment of the kindergarten:

...sometimes there's fantastic software but you need an adult there to actually show the children how to use it and to follow through... with twenty seven children you can't sit down and do it all. Knowing what software is available. The one we are using I think we have had about four or five years. It's going with what is comfortable. (Susie I1B, p. 6)

Through her own admission, although she was competent and confident with technology and believed that technology should be embraced in the kindergarten program, Susie was working with what she was comfortable with in technology. She felt she needed professional learning to broaden her understanding of the affordances of technology in the kindergarten.

Teacher organisation and preparation when using technology in the kindergarten was an important factor in Susie's uptake of technology as she noted that when things went wrong when using technology it could be because she wasn't well prepared:

We have got a battery charger but sometimes I forget to actually charge the batteries. Not having everything ready and available, sometimes that can be frustrating because technology is only as good as the person operating it and you can't operate things that haven't got charged batteries. (SusieI1B, p. 5)

Susie provided an example from her classroom practice that demonstrated the unreliable nature of working with technology and the challenge this presented in practice:

We've got in what we call our 'Calm Box' over there, a little MP3 player that has [pause] I think we've got 'Spot' on there at the moment, but the story's on there. I think it is the only thing I have found that children can't break because the CD players they do, the tapes decks get broken, but the MP3 player, it doesn't matter if it's dropped, or if they press the wrong button they might delete it but I just shove it back in the computer and put it back on... the battery I often forget to check because two of them will leave it on and of course it will drain it out, and then when a child goes to listen to a story it's not there ready available for them because I haven't checked often enough. (SusieI1B, p. 5)

From this example Susie clearly appreciated the benefits that MP3 players provided in terms of being accessible and easy to operate for young learners. However keeping them charged was an ongoing issue that seemed to relate specifically to time.

The issue of time as a barrier to using technology in the classroom was closely related to Susie's uptake of technology in the classroom. Susie acknowledged that any lack of uptake on her behalf could be attributed to time:

...I think time is another thing. Sometimes I have all these ideas I want to use with the children with technology, but having the time to actually do it and working with a group of 27 children sometimes you just can't do everything. (SusieI1B, pp.5-6)

As previously mentioned Susie was interested in and reasonably competent with using technology and yet she had not fully embraced the application of technology to the literacy context in her practice.

The initial interview provided information that was used by the researcher to determine an entry point for the first cycle using the action-reflection model (*Chapter 3, Figure 3.2*). Data from the initial interview suggested a readiness and willingness on Susie's behalf to be involved in professional learning with a pedagogical emphasis. Throughout the interview Susie provided evidence for these beliefs and understandings through examples of classroom practice.

Susie described her professional learning needs with technology in terms of "knowing what software was available" (SusieI1B, p. 6) and her purpose for obtaining this information was related to pedagogy:

I'd like to know what other software is available and the use of it, because sometimes there's fantastic software but you need an adult there to actually show the children how to use it and to follow through. Whereas I feel that with technology children are learning with each other and with themselves... (SusieI1B, p. 6)

In short, Susie wanted to know how to effectively integrate technology into her program thus suggesting a readiness, willingness and ability to engage in the professional learning with a pedagogical focus on literacy and technology for a six month period.

4.4 The Cycles

Preparation for the First Cycle of Action-Reflection

Following the initial interview Susie and the researcher met to discuss ideas for the first cycle. At this meeting the researcher introduced the action-reflection model (*Chapter 3, Figure 3.3*) to be used for each cycle in the data collection and the learning story journal (LSJ) as a key data collection tool. Susie was familiar with learning stories being used in early childhood to document children's learning but she had not used a learning story for her own reflection before and was eager to document her learning journey and to explore the application of this tool to the classroom (*Researcher Journal*). At this meeting Susie determined that she would introduce the children to using the digital camera in the first action-reflection cycle and observe the direction in learning that the children went through their explorations to inform her planning.

4.4.1 Cycle One: Exploring with the Digital Camera

Within each action-reflection cycle each educator reported on a series of learning episodes. These episodes were documented in the LSJs and researcher journal, and discussed in interviews. These learning episodes are described in this section as they occurred in each action-reflection cycle of professional learning.

Learning Episode 1: Introducing the Digital Camera

Susie had noted that a previous art project at the kindergarten had highlighted the children's interest in using the digital camera and for Susie, as previously established during the initial interview, following the children's interests was perceived by her as important for learning:

... we started on the art gallery. We were exploring art and then part of that art was photography, and then when we were doing the artist profile it came out that the children were really interested in it... (SusieC2, p. 1)

Susie further reiterated the importance she placed on following student learning interests in the documentation recorded in the LSJ as captured in Figure 4.2. The figure, extracted from Susie's LSJ, documents the children's excursion to the local art gallery and subsequent follow up activities that highlighted the children's interest in digital photography and thus Susie's decision after the first meeting with the researcher to pursue this focus further in the classroom.

As Figure 4.2 shows, Susie's observations of the children's play contributed to her decision to introduce digital photography as a focus in the kindergarten. Susie observed that the children incorporated the use and functions of pre-used display mobile phones into their imaginative play. She believed these behaviours were indicative of the children's high level of interest in technology and a strong justification for incorporating digital photography into the kindergarten program. In her interview reflecting on the first cycle Susie indicated that the children's interest in technology was significant:

...they've been using the mobile phones for texting for phoning and like this one here, Sally actually telling me all about the games she can play on there... they've already got that interest in the technology. (Susie C2, p. 1)

In Susie's story it would be important for her to build upon this acknowledgement of the children's interests in technology and learning for the affordances of technology in the literacy context to be realised.

FIGURE 4.2

Susie's LSJ1 Documentation for Introducing the Digital Camera

Commentary of critical incidents	Artefact
As part of our arts program the children went to visit the Fine Art Gallery to explore and appreciate a variety of Art work. (1) While at the art gallery the children created their own canvas 'painting' with oil pastels. (2) Back at Kinder this was followed up with a variety of different art mediums ... such as Aboriginal painting, match stick collage and photography. (3) When creating each child's artist profile to complement their work on display each child was asked what their favourite art medium was, when many of the children said that photography was their favourite I thought "Aha, here is something interesting we can explore" – I wonder where the children will take it??" In consultation with Karen [researcher] we discussed the idea of introducing a digital camera for the children to use in their play to see how this technology would influence their literacy development. I felt confident that the children would show a great interest in the 'real' camera as they have already been busy exploring the 'pretend' mobile phones in the home corner where they pretend to text and phone each other as well as play games (4) and take photos of each other.	Image unavailable 1. Children at the art Gallery exploring different types of art mediums Image unavailable 2. Children at the Art Galley creating a picture with Canvas and oil pastel Image unavailable 3. Joseph's collection of art work... Canvas painting, Aboriginal painting, match stick collage, photography and artist profile. Image unavailable 4. Sally telling me that she can play games on her phone - 'Looking in the forest'

Learning Episode 2: The Digital Camera in the Classroom

The introduction of the digital camera to the class was met with enthusiasm from the children:

The introduction of the camera was popular with the children ... I introduced it to the children at the beginning of a session while we were all on the mat – there were a quiet a few 'ohhh' and 'ahhs' from the children (they often express their excitement this way!) As soon as I dismissed the children more than half of them made their way straight over to the camera. (SusieLSJ1, p. 3)

The classroom had clearly established routines and expectations but even so, Susie was interested to see how the children would respond to this new item in the room: "It was interesting to see how the children worked together not only to share the camera, but also to share the experience" (SusieLSJ1, p. 3). In her initial interview Susie had noted a desire to explore technology in the kindergarten in a social way rather than solitary way: "I feel that with technology children are learning with each other and with themselves..." (SusieI1B, p. 6); "...we try to make it [technology] a social thing where they work together on it [technology]" (SusieI1B, p. 6). In her recorded observations of the introduction of the camera Susie noted her satisfaction with the children's' cooperation and organisation in using the

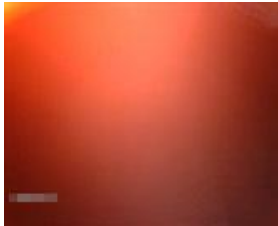
camera. Indeed it would seem that previously established routines and expectations ensured that the children’s immersion in the experience was a social one:

Small groups of children organised their friends to pose for pictures and then after taking the photo quickly looked to see how the picture turned out. With lots of trial and error the children slowly worked out that the orange that was appearing in their photos was due to their finger being over the lens! (SusieLSJ1, p. 3)

Figure 4.3 shows Susie’s thinking at the time of the Digital Camera learning episode. The written text provides insight into Susie’s perceived value of the social experience for learning with artefact support in the form of photographs to show the interactions between the children. The photographs show the children organising themselves to pose for photos and the outcome that was sometimes an orange haze presenting a challenge for the children to work through. For Susie, children’s technology and language learning were entwined. The learning episode emphasised progress towards one of Susie’s key goals referred to in her initial interview (Section 4.3) for children to have opportunity to practice and use language in authentic contexts in order to learn language. For example, in this scenario, the children problem solved and shared this new learning with others when a finger over the lens issue arose. In problem solving, language learning and meaning making were entwined as the children used the digital camera providing the opportunity for immersion in dialogue, engagement in taking photographs, opportunity to make mistakes and learn from them and to practise taking photos and learn about the digital camera alongside others in an authentic context for learning.

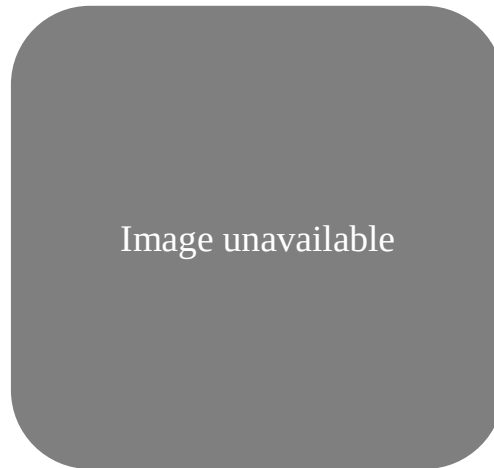
FIGURE 4.3

Susie’s LSJ1 Entry from Page 3

Commentary of critical incidents	Artefact
The introduction of the camera was popular with the children ... I introduced it to the children at the beginning of a session while we were all on the mat – there were a quiet a few ‘ohhh’ and ‘ahhs’ from the children (they often express their excitement this way!) As soon as I dismissed the children more than half of them made their way straight over to the camera. It was interesting to see how the children worked together not only to share the camera, but also to share the experience. Small groups of children organised their friends to pose for pictures (5 & 6) and then after taking the photo (7) quickly looked to see how the picture turned out. With lots of trial and error the children slowly worked out that the orange that was appearing in their photos was due to their finger being over the lenses! (Some are still to work this out)	Image unavailable 5. Jenna organising a group of friends on where to stand for the photo.
	Image unavailable 6. Ellie, Shelley & Eamon posing for Jenna
	 7. Oops – Need to move the finger!

The researcher noted on an observational visit the way in which the children seemed to be exploring the functional aspects of the camera in the early stages of the cycle. In an early exploration three children gathered around the mirror watching as one of the children was “taking a photo in the mirror” (Researcher Journal). The photograph is displayed in Figure 4.4.

FIGURE 4.4
Children Exploring with the Digital Camera



Whilst the camera in the classroom proved to be very popular with the children in Susie’s classroom, the children soon raised the need for some intervention that allowed equitable access for all who wanted to use it. Susie noted the children’s concerns in her LSJ and highlighted the way in which the children worked through the issue of access together to come up with a solution to their problem:

The popularity of the camera was becoming a bit of an issue for some of the children who were waiting for their turn. After a few children asked me, ‘*When can I have a go Susie?*’ I put it back on them ... ‘*How do you think we can share the camera fairly?*’ A few children shrugged their shoulders, some others replied that we should share, so I encouraged some further thinking by asking ‘*How do we share our time on the computer?*’ June quickly yelled ‘*The timer – I’ll go get it!*’ After getting the timer he turned it upside down and told George it was his turn when the timer finished. (SusieLSJ1, p. 4)

In her facilitation of the children’s discussion Susie was able to provide a scaffold to support the children’s problem solving in the form of a guiding question; “How do you think we can share the camera fairly?” Susie’s LSJ entry indicated an expectation that the children would come up with a solution to the access issue, leaving the children responsible for the final decision. The scaffold question used by Susie focused the attention of the children to another routine that was already working well in the class thus prompting a child to make a connection between an existing routine and the potential to apply it to the current context. The child shared this new knowledge with the class and it was embraced as the solution to their access problem.

Over the following days the children continued to explore the camera in the kindergarten environment. The popularity of the camera continued. Despite the use of the timer the camera was so

popular that there were children waiting for long periods of time to use it. This issue was the subject of contemplative and reflective discussions between Susie and the researcher. Susie's learning story entry shows that she put the responsibility for problem solving again back on to the children and the solution identified in the other kindergarten group (Group A) was easily transferrable to the case study group (Group B):

The waiting for a turn became a bit of a problem for both groups of Kinder children ... Group A decided that they needed a waiting list like the one we use for the computer ...so a small group of children joined me in the office and we made up and printed a camera waiting list before laminating it and sticking Velcro on it for the names to be attached. Then next day when Group B children arrive they too decided to use the list – they knew what to do as they have used one just like it while waiting for a turn on the computer. (SusieLSJ1, p. 4)

The journal entry indicates that through conversation and dialogue the children found a solution to the on-going access issues. The children suggested the application of an organisational routine they were familiar with from another part of the program to the current context and this appeared to provide for fair and equitable use of the digital camera. Figure 4.5 shows an excerpt from Susie's LSJ relating to this incident. Susie included photographs in her LSJ to visually represent the system and the emergence and adaptation of an organisational solution which arose from the children's problem solving. Evidence of the orderly manner in which the children used the waiting list was observed by the researcher on an observational visit: "Children were waiting in turn to use camera. Children were busy chatting and using the waiting list independently" (Researcher Journal). When the egg timer was added to the program it was observed that the "children worked out the egg timer system for taking turns" (Researcher Journal). Susie later reflected on the way in which previously established routines had assisted the children across both kindergarten groups to resolve the issue of fair and equitable access to the digital camera:

Groups of children wanting it [digital camera], especially when we first introduced the camera, they liked the novelty of it, everyone wanted a turn and I was trying to work out how to put it in [LSJ], because Group A came up with this. I could talk about how Group B had taken it on as well and because they're so used to using it with the computer it was like that, "Oh yes I'll go and put my name down." (SusieC3, p. 2)

In her reflection Susie noted that transferability of the resolution between both groups was possible because of the consistent routines and expectations across the kindergarten that the children understood.

FIGURE 4.5

Susie's LSJ1 Entry for Page 4

Commentary of critical incidents	Artefact
The popularity of the camera was becoming a bit of an issue for some of the children who were waiting for their turn. After a few children asked me “When can I have a go Susie?” I put it back on them ... “How do you think we can share the camera fairly?” A few children shrugged their shoulders; some others replied that we should “share” so I encouraged some further thinking by asking “How do we share our time on the computer?” June quickly yelled “The timer – I’ll go get it!” (9) After getting the timer he turned it upside down and told George it was his turn when the timer finished. The waiting for a turn became a bit of a problem for both groups of Kinder children ... Group A decided that they needed a waiting list like the one we use for the computer (Eamon thought of this) so a small group of children joined me in the office and we made up and printed a camera waiting list before laminating it and sticking Velcro on it for the names to be attached (10). Then next day when Group B children arrive they too decided to use the list – they knew what to do as they have used one just like it while waiting for a turn on the computer. (The children find their laminated name and photo and attach it to the list with Velcro- 11)	 9. Timer used at the computer  10. Camera waiting list 

Figure 4.6 shows a series of photos taken where a small group of girls posed and pulled faces for the camera highlighting the social use of the camera in the kindergarten. On an observational visit the researcher reported that the “children seem to have adopted many of the social behaviours they have observed others doing with the camera (i.e. taking a photo, posing, taking photos of them taking a photo and photos of photos)(Researcher Journal). The photographs in Figure 4.6 and Figure 4.7 reveal some of the ways that incorporation of the digital camera into the program had highlighted these social aspects. Researcher notes taken on the day of an observational visit indicated that “some children started to play ‘shy’ with camera and would hide when it was around. This seemed to be a fun thing to do and they enjoyed sharing the ‘shy’ photos together (Researcher Journal)

FIGURE 4.6

Girls Posing and Pulling Faces for the Camera

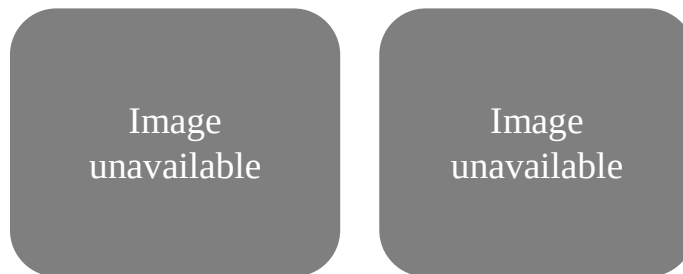


Figure 4.7 shows boys behaving and using the camera in a social way described by Susie:

FIGURE 4.7

Boys Posing and Pulling Faces for the Camera



The photographs in Figure 4.6 and 4.7 were taken by children towards the end of cycle one. They show a progression in the way the children prepared for a photograph. The photographs in Figure 4.8 were taken by children early in cycle one when children were still learning how to use the camera and were not yet exploring with communication using the digital camera. Early in the cycle photographs of objects did not appear to have any particular artistic form. Figure 4.9 shows a sample of the types of photographs children were taking of objects at the beginning of the cycle where there appeared to be no particular emphasis on subject matter or meaning making. As the cycle progressed Susie observed an artistic quality to some of the photographs that began to emerge. The arrangement of cups and feet in the photographs in Figure 4.10 show how some children experimented with artistic presentation using the digital camera:

FIGURE 4.8

Children's Photographs of Each Other at the Beginning of the First Cycle

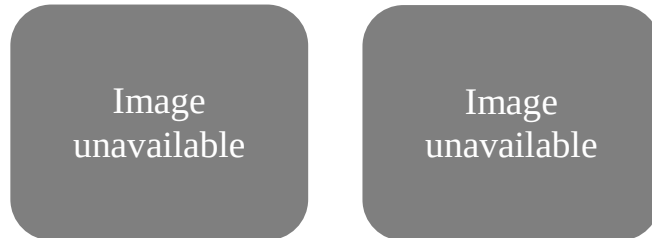


FIGURE 4.9

Sample of Photographs of Objects taken by Children Early in Cycle One



FIGURE 4.10

Artistic Representations in Photographs taken by the Children



Susie noted that during the first cycle some children posed for photos using the 'V' symbol (Figure 4.11) and this surprised her:

...there's one of Chris and Jessica doing the 'V' sign which you see in so many photos...and I thought, *'I wonder where they picked that up from?'* (Susie C3, p. 1)

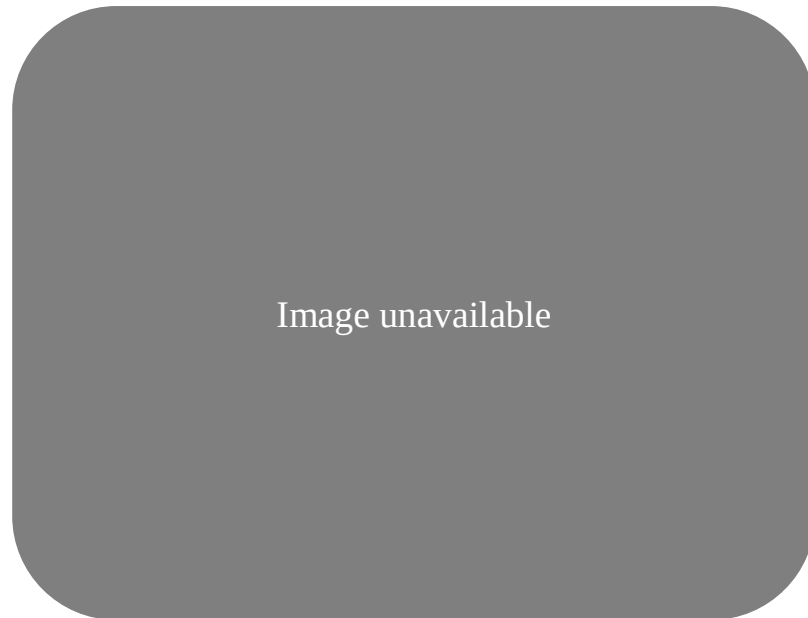
Susie believed this behaviour seemed to be cultural and was interested that the children had brought this into their play with the digital camera:

...when I was looking through their photos I thought, *'Oh that was interesting,'* because it's definitely the 'V'. So they've got culture coming out in it. (Susie C3, p. 1)

Similar use of cultural symbols were also photographed and noted in Figure 4.7 where children photographed each other making the ‘thumbs up’ and stop signal, supporting Susie’s suggestions that some children were exploring different communication symbols in their photography.

FIGURE 4.11

Chris and Jessica doing the ‘V’ symbol for a photograph



Towards the end of the term the children went on an excursion to Science Works. Susie hoped this visit would provide a context for the children to further explore with the digital camera:

...I think I might be able to do that a little bit at Science Works in that I’ll have the camera on me and I’ll tell the children that *‘if there is something really interesting you want to take a photo of come and ask for the camera and you can go and take your own photo’*. (Susie C2, p. 4)

However, on the day of the excursion few children chose to take up this option. Only three photos were taken by one child at this excursion. These photos are displayed in Figure 4.12.

The three photographs taken were by the same child but this child’s interest in using the camera at ScienceWorks was not sustained. Susie believed that the children did not choose to use the camera on this excursion because they had to come and get it from her and there were too many other new and stimulating experiences that drew attention away from using it in this context.

FIGURE 4.12

Photographs taken by George at Science Works



Image
unavailable

Image
unavailable

Extending to Peripherals

Midway through the first cycle Susie noted that the novelty had worn off and the camera was more accessible: “...for some I think the novelty of it has worn off a little bit, which I was expecting” (Susie C2, p. 4). This presented Susie with an opportunity to introduce other related peripherals to the learning context in a scaffolded way; first the printer for children to print individual photos, then the memory cards to enable children to be printing and taking photographs at the same time and finally the digital frame for children to view their photos. Susie noted that the introduction of peripherals further stimulated children’s interest and their exploration continued:

...at the moment we are still exploring because I’ve introduced the frame and I’ve got three memory cards so they’re actually learning how to do it. They still come up to me and ask for help occasionally but they’re actually learning how to change it around themselves... (Susie C2, p. 4)

The opportunity for further exploration was welcomed by Susie, who stimulated by her reflections with the researcher, expressed the desire that once the novelty had worn off the children would go deeper with their learning using the digital camera:

...I want to be able to use it as in they have made something or done something and they are really happy with it and want to show Mum or Dad or they want to extend on it I can say, ‘*Look go and get the camera and we can take a photo.*’ So at the moment they’re still taking the camera around to different things for the sake of using the camera. Whereas I want to move it to where they can go and get the camera to enhance what they’re doing. (SusieC2, p. 4)

As the cycle progressed Susie used a scaffolding approach to extend the children’s exploration with the digital camera. Susie introduced a printer, memory cards and a digital frame to the learning context using a scaffolded introduction of one piece of hardware at a time determined by her observations of the children’s interactions and listening to the children’s conversation. Susie noted that scaffolding “...comes with practice, but knowing when to step back and let them direct and when you need to scaffold and give ideas” (SusieC3, p. 3).

Learning Episode 3: The Printer

In Susie's LSJ she documented the way in which the introduction of the printer further prompted children's interest in the digital camera and broadened the learning experiences she observed:

While the children have still been interested in the using the camera the 'novelty' of it has worn off a little – this soon changed when I introduced the printer. Many of the children were eager to print out their photos – it was interesting to see what they actually did with their print outs; I was thinking that they may want to write a story about what they have taken a photo of, extend on it with a drawing or decided to do both and hang it up at Kinder. Many of the children decided that they just wanted to print their photos and then show their friends (great oral language). A few wished to document what the picture was about. (Susie LSJ1, p. 5)

This documentation shows the way in which Susie allowed the children to take their learning with the digital camera in the direction of their interest rather than the direction that she designated. She noted that one child in particular wanted Susie to scribe a message about his photo. The dictation provided further information that was not necessarily clear from just looking at the photograph the child [Joe] had taken. Susie included this example in her LSJ (*Figure 4.13*) as evidence of his effort to communicate his idea to a wider audience:

Joe's was an interesting one; his photo was of himself hiding behind the teddy. He told me, "This is me trying not to have my photo taken. I put the bear in front of me while William took the photo" (Susie LSJ1, p. 5).

FIGURE 4.13

Photograph taken by Joe and Artefact collected for LSJ1



Notes taken by the researcher during this session indicate that when some of the other children saw Joe's printed photo and sentence they were stimulated to take their learning in a similar direction:

Joe wanted to write a sentence about his photo. Susie wrote his name on the printed photo and took a photo of him working with his photo. He then took his finished work and shared it with others in the room. His conversations with his friends created further interest by others and soon there were more children working at the writing/drawing table with their photos. (Researcher Journal)

For most of the children, Susie observed that the printer provided a mechanism for further dialogue about their photography: “Many of the children decided that they just wanted to print their photos and then show their friends” (Susie LSJ1, p. 5). Susie believed that this had benefits in encouraging oral language development as the group interacted in a social way: “... I’ve got a really good group with sharing their ideas; yes they’re good at that” (Susie C3, p. 3). A similar note was recorded in the researcher journal highlighting the talk that the possibility of printing out photographs seemed to generate:

Much interest was shown in selecting photos to print and there were conversations between groups of children about which photos to print. (Researcher Journal)

In her LSJ Susie reflected: “the children have continued to be very active in their use of the camera. Much of this use has enabled a great chance for the children to engage in oral language” (Susie LSJ1, p. 5). This reflection shows that Susie has observed and valued the opportunity that the digital camera has presented for children to engage in dialogue, to practise and use language in a meaningful context. Susie noted one example where photography, drawing and language were intertwined in a meaning making process. In this example a child took a photograph of his friend and then printed it out. He then drew a picture of his friend and used the two; photograph and drawing, to communicate his idea to an audience:

...on one of the shelves there is a photo of a child pretending to be asleep. Christian took a photo of Jimmy ... and he definitely wanted that one and had to print out. So there is a photo of Jimmy on the mat pretending to be asleep and then there’s a picture of him that Christian drew – here he is awake and here he is asleep, and he wanted to show everyone so it’s hung up at Kinder for everyone to see (Susie C2, p. 6)

In this example, the drawing and the photograph were used to communicate the child’s understanding of the concepts ‘asleep’ and ‘awake’ and so important was the communication of this idea to the child that it was put on display for all to see.

Learning Episode 4: The Digital Frame

Susie noted that initially the introduction of the digital frame did not receive the response from the children that she expected:

When we first got the digital frame I used to have it on every day and I found it would draw to begin with. You would have a lot of kids there but then they would become oblivious, like that’s always there... (Susie C3, p. 4)

Susie likened the children’s reaction to the digital frame to the way many of us respond to the television:

It's like people like myself who have the TV on as background noise, you don’t even know what’s on sometimes because you’re just so used to it being on. (SusieC3, p. 4)

Using the information gained from her observations of the children’s response to the digital frame Susie changed the way she provided children access to the digital frame:

...now I always have it out but it's not always on. If they want to put their photos on they can but I don't have it continually playing and that way I think it draws their interest a bit more. (Susie C3, p. 4)

This subtle change in the way that the digital frame was used in Susie's eyes encouraged further talk among the children. Susie provided an example that shows how the use of the digital frame was integrated across the classroom learning program and encouraged dialogue:

...we had the fire brigade on the Monday, and I also recorded their concert practice and I put that onto a memory card and put it in the digital frame and I told the children it was going to be there. Well over they came and I had it playing because the frame is fantastic. It just continually plays, and then they'd have a look at the photos and then they would walk away, but once it came on to the concert practice and it was video footage the volume would come and it would draw them in. They would be watching and they were talking about it all. *'There I am over there. When did my song come up?'* and then they were singing along to it as well. They were re-visiting it and then going into the music corner and also re-visiting what they had done in the concert which was great. (Susie C3, p. 3)

Susie notes that the video footage, of the children rehearsing for the concert, being played on the digital frame, attracted the attention of the children and then acted as a springboard for further talk and practice in the music corner.

Learning Episode 5: Snack Bear's Locker

In her LSJ Susie describes a learning episode using the camera and printer where she felt the children demonstrated responsibility for the learning that occurred and created something that was purposeful and needed in the classroom:

The children have taken a new path with the camera & printer – rather than just printing out their photos to discuss, write about or just take home, they have now used it to create something which they felt was needed in their room ... a locker for Snack Bear (Snack Bear joins us for snack time with his own snack and drink). (Susie LSJ1, p. 6)

Susie continued the LSJ entry by describing the way in which the children worked together to create a locker for Snack Bear. The process of creating the locker for Snack Bear integrated the use of the digital camera and printer throughout and is captured in the documentation through a journal entry and series of photographs represented in Figure 4.14.

Not only does Susie's journal entry note highlight how the use of technology is integrated throughout this learning episode but the children, it is noted by Susie, play a pivotal role in the direction of the learning: "While I [Susie] was there to assist the children and occasionally offer ideas, it was the children who led in the decision making" (Susie LSJ1, p. 6). Figure 4.15 displays a series of photographs showing Susie and the children creating Snack Bear's locker. The high level of involvement of the children in this learning episode was also noted by the researcher:

Group of children are working with Susie – choosing photos to print. Snack Bear photos have generated much interest. The purpose of taking Snack Bear photos is to

create a locker and name tag for teddy. Children take photos of Snack Bear in different poses. Children worked with Susie to transfer photos to a computer so that they could see their photos on the laptop. (Researcher Journal)

FIGURE 4.14

Excerpt from Susie LSJ1, p.6

Commentary of critical incidents	Artefact
Using the camera the children took Snack Bear's picture (13), printed it and typed his name on the computer to make his locker name (I asked the children if they wanted to write his name or type it and they decided on typing it as that is how theirs is done) . After making his locker tag (14) they then found him a locker (15) followed by a bag, coat and clothes. The children then decided that his bag needed a name tag like the ones they made earlier in the year so they typed out his name again, decorated it and laminated it (16).	 13. Snack Bear  14. Making Snack Bear's locker name  15. Finding a locker for Snack bear  16. Laminating Snack Bear's name tag

FIGURE 4.15

Susie and the Children Creating Snack Bear's Locker



In her following interview Susie described how Snack Bear appeared in the classroom out of necessity; the need to clear a pathway for snack time, and then how the children embraced Snack Bear as a member of their group:

At snack time we didn't have a clear path way for the children to get through so I just put the bear down for snack time. Then they voted on what his name was going to be, and then he all of a sudden got a snack box and then they decided, '*Well he is part of kinder, so now he needs a locker,*' and this was all happening at snack time when they were discussing, '*We'll do this and this,*' and they followed up on it... (Susie C3, p. 2)

Susie noted that the child who instigated the idea of creating Snack Bear a locker did not follow through with the plan to the extent of the other children but came up with the ideas:

...it was interesting Jimmy was the main talker at snack time about what we should do and yet he wasn't heavily involved in the actual doing. He gave the ideas. (Susie C3, p. 2)

When referring to her own role in the creation of the Snack Bear's locker Susie described her involvement as assisting the children without intervening in the decision making dialogue that she felt belonged to the children:

I was there to assist them in what they needed and help out but they decided what they were going to do and it had to be just like theirs- their lockers. So they were asking, '*How did you get it this size and how did you do that?*' So it was it was really interesting. (Susie C3, p. 2)

Susie held a similar view about her role in the classroom throughout the cycle. In her interview at the end of the cycle Susie stated:

I'm there as, not so much a facilitator, more as a resource. I may offer ideas, I may scaffold certain parts of it, but they're the ones that work out in their groups or individually what they want to do and how they're going to do it and if they're not sure they'll ask. (Susie C3, p. 4)

Earlier observational notes taken by the researcher on an observational visit described Susie's interactions and involvement with the children in a similar way:

Susie was very much a facilitator of learning. Guided children but allowed the children to determine the direction the experience would take them. (Researcher Journal)

Susie's role described in this way alludes to innovative practice whereby the teacher guides the learning of the children through careful observation of their participation in the learning episodes.

4.4.2 Susie's Reflections on the First Action-Reflection Cycle

At the end of the first action-reflection cycle Susie was interviewed. Susie's learning story journal was used as a stimulus for discussion throughout this interview, as she talked about her mediation of

technology in the literacy context and the different ways that she observed the children engaging with technology throughout the cycle.

Technical Glitches: Memory Cards

Throughout the action-reflection cycle in which Susie introduced the digital camera a number of issues or technical glitches occurred. Of particular significance were the access restrictions evident by having only one memory card:

I only had one memory card... when it came time to print out that meant that the camera was unable to be used by anybody else, and also they [the children] didn't use the digital frame as much as what I thought they might. (Susie C3, p. 3)

Susie noted in her LSJ that the purchase of three additional memory cards enabled the children to take on responsibility as they learned to change memory cards independently. This independence meant that different groups of children could be printing photographs, taking photographs with the digital camera and viewing photographs and videos on the digital frame at the same time, thus addressing the access issue that had emerged with the introduction of new hardware. Susie summarised the issue and subsequent resolution in her LSJ entry:

I found that I had to re-think the use of a single memory card for the camera, digital frame & printer – once the card was taken out of the camera by one child to use in the printer (they haven't really taken much interest in the digital frame) then the camera couldn't be used by anyone else until the printing had finished. Lucky memory cards are rather cheap – I went out and bought three ... one for the camera, one for the printer and one for the digital frame. This has worked well as the children are now taking the card out themselves and using in the printer as needed (they still ask for my help but are able to do much themselves). (Susie LSJ1, p. 6)

Researcher journal notes taken on one of the observational visits support Susie's observations of the children's developing responsibility and independence in the use of the hardware:

Most children are now able to load cameras with memory sticks themselves. They are taking photos and downloading and printing without assistance. (Researcher Journal)

It is also of interest to note that Susie's commentary acknowledged that some children still needed assistance with the changing of memory cards and Susie continued to provide assistance when required.

Technical Glitches: Charging the Camera

The only other significant technical glitch that was identified by Susie during the first cycle was 'remembering to charge the camera at the end of each session' (Susie C2, p.6). Susie admitted that both she and the Kindergarten Assistant were having difficulty maintaining a routine of charging the batteries for the camera after each session. To assist with this process Susie initiated the assistance of the children: I've got the children actually telling me when we're packing up, '*Plug the camera in*'. (Susie C2, p. 6).

The shared responsibility for access to technology described in the above example, extended beyond shared responsibility of kindergarten staff and children for maintenance routines. Susie described the way in which Jill, the Kindergarten Assistant, had embraced learning with the digital camera, by learning alongside, and in dialogue with, the children:

Jill's not as technology minded as what I am but she is comfortable in the children using it. If the children come and she doesn't know she'll just say, "Go see Susie," and sometime they say, "Don't worry we'll go see Susie," but she is taking it on board as in she'll ask the kids, "What are you doing here?" and "How do you do that?" so she is actually learning from them. (Susie C2, p. 6)

In a similar way Susie noted that at times she found herself learning how to use the technology alongside the children:

When we were printing the Snack Bear word it's the first time we'd had the printer connected in and it wasn't working properly first and they [the children] were quite patient to sit there while I worked it out. Yes and yes, we eventually got there. (Susie C3, p. 4)

Susie acknowledged that learning in this way benefited her and the children: "Learning process for me too." (Susie C3, p.4) but indicated during an interview in the second action-reflection cycle that she believed early years educator confidence with technology was an important factor in establishing this learning environment with technology:

Children can see if you are confident in it or not. It's one of those things when children know that something is going on, it's not as if you're telling them something's wrong, they're able to read the signs to know what's going on. It's just, like the confidence in technology; they know I'm happy to have a go at it. (Susie C3, p. 4)

What appears significant about this quote is that Susie placed importance on early years educators having the confidence to problem solve and learn using technology with the children. This is a significantly different view to the teacher being an expert with technology in the classroom.

Reflections on Children's Learning during Cycle One

For Susie, a key strength of the first cycle was the time the children had to explore and learn with technology:

I think having the time to explore the equipment and trial and error, like with their finger... some of them I don't know how they've done it but they have got the photo and they've got an orange haze. It's as if their finger's shadowing or something I'm not sure how they've done it... in regards to the learning side, I think because it has been allowed to be incorporated into everything that they're doing. It's not, '*it's time to play with this now. We've got half an hour or so with it and then it gets put away.*' It's part of the environment. (Susie C3, p. 3)

In her interview Susie noted in the following excerpt that given time to explore the technology the children engaged in dialogue that, in turn, promoted learning:

...they did ask how could they look at the picture and I've shown them which buttons to push and they know now they push that button twice and they can have a look, and that's led on to more discussions about what they can see and they've got to take the photo again because it didn't work out. (Susie C3, p. 3)

The children's learning as Susie recognised it in the first learning cycle was largely related to language. The incorporation of the digital camera into the play-based program at the kindergarten encouraged plenty of talk and social engagement and in Susie's opinion this was a critical aspect of the learning:

...the oral language because I was thinking that they [the children] would print their photos off and then they'd like to write a story, but they are more interested in talking to each other about what's going on and what they are doing. And the social aspect, that's why I chose these [photographs] in particular. It shows how they're organising their friends and posing for photos...it's amazing just to look through some artistic type photos, others - this is, like teenagers up their friends noses (Susie C3, p. 1)

Over time the children took their learning using the digital camera in a variety of different directions and not necessarily in the direction that Susie expected the learning to go. For Susie, the cycle highlighted the sometimes unpredictable ways that the children engaged in learning:

I probably expected ... Annie to take on a little bit more of it. She uses it a lot in imaginary play in home corner in regards to the digital, the mobile phones and all that kind of stuff so she doesn't need the actual real life stuff that works. She's more into the imaginary side of it. Yes. And Hugh, who previously would use the computer quite a bit, and was quite competent in using it, I thought he might latch on to it, and he has been interested, he's been watching what's going on and has a go, but not like George. (Susie C3, p. 5)

The diversity of responses from the children to the digital camera that was evident to Susie throughout the cycle, showed "how the children have been involved and where they've taken it [digital camera] (Susie C2, p. 1). For Susie, it was this child led exploration that would determine her planning for the next cycle:

I still want to continue with the camera because it has become part of the everyday program now and I want to think of ways that we can incorporate it more. (Susie C3, p. 5)

Susie's reflection shows the extent to which she believed that the technology; and in particular the digital camera and printer have been integrated into the kindergarten program.

During this interview with the researcher there was a period of contemplative discussion in which Susie decided that in the next cycle she was keen to extend on the learning and the interest that the children had demonstrated in cycle one, perhaps through stories and book making using digital photography:

...we do a lot of story, not so much story, but book making where we'll reflect on what we did at Science Works, or, I've actually sent out a thing for them to bring back after the holidays on what they did on the holidays and what they're looking forward to when they come back to Kinder. That should be interesting. So we do a lot of book

making, so actually making a story, because they're really in to stories and the author and the illustrator and all that kind of stuff. (Susie C3, p. 6)

Susie had already made a book with the children about their excursion to Science Works but she had not used digital photography in the book making process (Researcher Journal) and this was something that she was keen to explore further with the children. Given the strong communicative and social aspect to the children's learning that had emerged using the digital camera, Susie had identified another possible area of extension in the form of communicating via email. This presented as an appealing option for Susie as there was a child in one of the kindergarten groups who was going on an extended holiday with his family.

Reflection Illustration: Email

The possibility of communicating through email provided a context to explore with the children the communicative aspect of technology further and the sharing of photographs over long distances:

One of our little boys in Group A, he and his family are travelling around Australia for the last term. So we've got e-mail addresses and were going to send photos of what we're doing at Kinder and letters to him via the e-mail and vice versa. He and his family are going to let us know what they're up to and what they're doing. That's with Group A, I am just working out how I can do something like that with Group B, because they talk about using computers at home and the internet, so I'm wondering how I could. (Susie C3, p. 5)

Susie's second cycle thus had an authentic context for the use of technology as the events occurring in the kindergarten community gave rise to the opportunity to explore communication with technology via email and the internet.

4.4.3 Cycle Two: Technology in Everyday Play and Learning

Learning Episode 6: Using Technology for Communication

Susie described the second cycle as 'Technology in Everyday Play and Learning'. This cycle ran throughout term four, the last term of the kindergarten year. The goal that Susie identified, in collaboration with the researcher prior to commencing the second action-reflection cycle, was to extend on and deepen the children's learning experiences that had occurred in the first action-reflection cycle.

Throughout the final cycle the children continued to explore the digital camera:

The novelty of the camera wore off after a period of time and it became just another learning centre within the room – I think this allowed the children more time to explore (taking an interest) what they wanted to do with the camera as there weren't often other children waiting for a turn (being involved). (SusieLSJ2, p. 1)

Again, they used the camera in a social way, and the purpose behind using the camera continued to be communicative. However, the ways in which the children used the digital camera in the meaning

making process continued to be creative and purposeful and Susie believed she was able to gain a deeper understanding of what they were communicating with the camera:

It was through looking at the photos that the children took that I was able to develop a deeper understanding of what the children were exploring and learning through the use of the camera. (Susie LSJ2, p. 1)

They [the children] took more time in their exploring and then I put how looking at the pictures they took you could gain more of an understanding of what they were doing with the camera and what they were learning...(Susie F5, p. 1)

Of particular interest to Susie was a photograph, taken by a child of her reflection in the toaster (Figure 4.16). Susie included this photograph and caption in her LSJ as she was interested in the way that the child used the digital camera to explore reflections (Susie F5). Another child used the digital camera to communicate his understanding of signs and symbols. Susie noted that in his play the child:

...was taking photos of the phone and the ‘dial 000’ and telling the kids what to do, so it was part of the play. It was not so much having to have the photos it was more part of their [the children’s] play. (Susie F5, p. 1)

In this example the children “were playing fire fighters” (Susie F5, p.1) and the use of the digital camera seemed to be to communicate knowledge in the pretend play.

FIGURE 4.16

Artefact Column of Susie’s LSJ2, p. 1

Artefact	
	1. Gayle exploring her reflection in the toaster.
	2. Photo of the phone + the 000 number (the children were playing firefighters at the time).
	

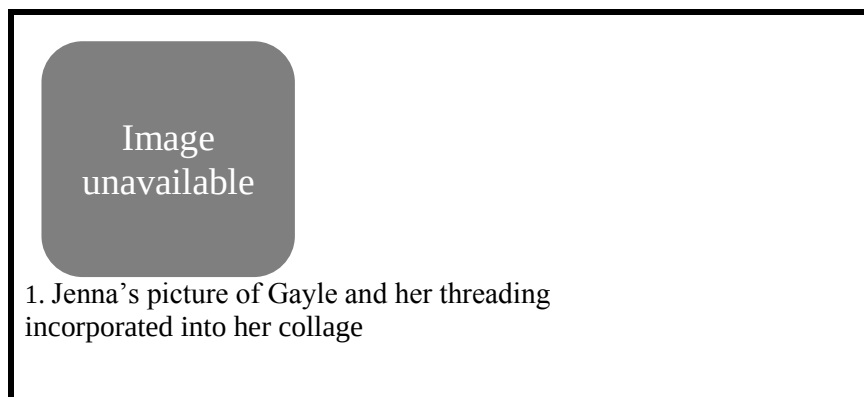
Over time as the use of the digital camera became more purposeful. So too did the use of the printer:

The children's use of the printer decreased over time (we didn't even have to change ink cartridges!). Those who did print out their photos chose to take the photo home or use it in their art work – such as Jenna did with a photo she took of Gayle. (Susie LSJ2, p. 2)

Susie included in the LSJ a photograph of Jenna's art work that was created using a photograph that Jenna had taken of her friend Gayle (*Figure 4.17*). Susie included this artefact in the LSJ to show the way in which some children chose to print out photographs they had taken and then add further details using art materials. According to Susie, Gayle "used it [photography] more in her collage" (Susie F5, p.1). It seemed that Gayle was interested in the affordances of digital photography for communicating creative expression as this how she chose to use the photographs that she took.

FIGURE 4.17

Jenna's Collage and Caption in Susie's LSJ2, p. 2



Learning Episode 7: Pet Rocks

Towards the end of the kindergarten term Susie recorded two significant entries in the LSJ. The first involved the digital camera and pet rocks. The kindergarten children had been making pet rocks and two children; Sally and Hamish, decided to take their pet rocks on a holiday. They used the digital camera to record the adventures of their pet rocks and used the play back mode on the digital camera to tell the story of their pet rocks holiday to others:

Hamish and Sally had been busy making their pet rocks with me talking about all of the things their pets could do once they were dry. The next day I noticed that they were busy taking photos of their pet rocks. When they had finished they came over to share their story with me. Their pet rocks had been on holiday and they had holiday photos to show me! As they played back the photos on the camera they talked about how they had been swimming as well as shopping and had to be very careful in looking out for cars (photos were taken on a car track!). Once again the photos didn't

need to be printed as the play mode of the camera was sufficient for their story telling.
(Susie LSJ2, p. 10)

For Susie, one of the memorable aspects of this learning episode, which she chose to record, was the way in which the children used the play back mode on the camera as a storytelling device. The way in which Susie chose to record this episode using some of the children's photographs is detailed in the excerpt from Susie's LSJ in Figure 4.18. The children did not need a print out of their photos as the play back mode was sufficient for their retelling. However it is also significant and noted in the documentation that the children spent time talking with Susie about what their pet rocks could do before they decided to use the camera to tell the story of their pet rocks holiday the following day. In Susie's documentation it is evident that talk was an important part of the process before, during and after the digital storytelling was created. The use of the digital camera in this episode seemed to be to provide the young storytellers with the visual documentation of the story that they deemed necessary for their retelling. The images taken by these children are displayed in Figure 4.19.

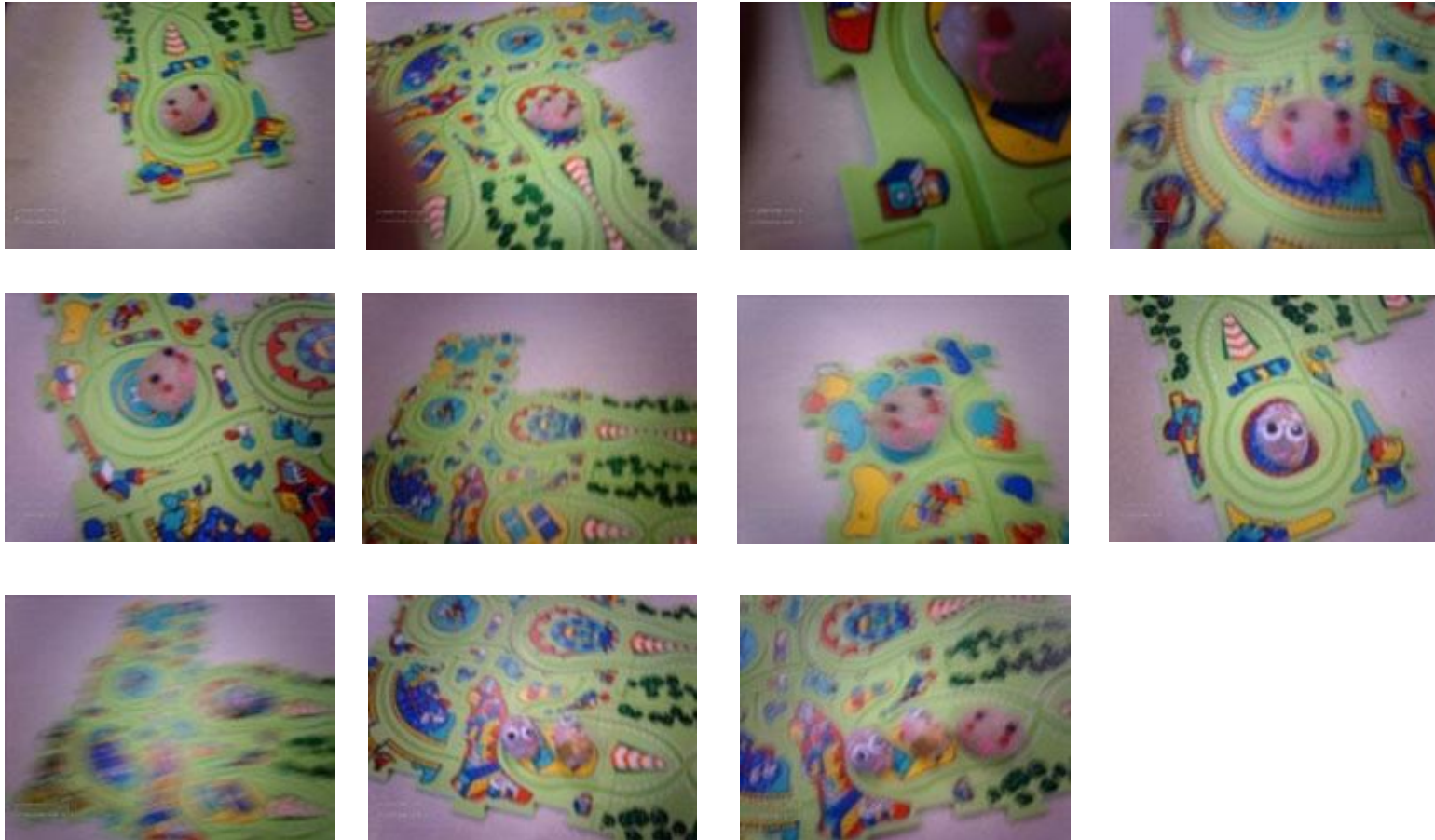
FIGURE 4.18

Excerpt from Susie's LSJ2, Pet Rocks

Commentary of Critical Incidents	Artefact
Hamish and Sally had been busy making their pet rocks with me talking about all of the things their pets could do once they were dry. The next day I noticed that they were busy taking photos of their pet rocks When they had finished they came over to share their story with me. Their pet rocks had been on holiday and they had holiday photos to show me! As they played back the photos on the camera they talked about how had been swimming as well as shopping and had to be very careful in looking out for cars (photos were taken on a car track!). Once again the photos didn't need to be printed as the play mode of the camera was sufficient for their story telling.	 23. Children's pet rocks
	 24. Sally & Hamish's Pet rock friends on holiday
	

FIGURE 4.19

Pet Rock Holiday: Photographs taken by Children and used in Storytelling.



Learning Episode 8: Integrating the Digital Camera into Christmas Play

Although Christmas was fast approaching and there were many other activities occurring in preparation for the end of year; Christmas concert and party to plan and presents to make, the children continued to embrace the use of the digital camera as part of their kindergarten play. Notes taken by the researcher on this day show the way in which the children were engaged in playing ‘Santa’ and using the camera in the play:

A group of children are playing ‘Santa’ and delivering presents. Reindeer taking Christmas presents. Emily spends a lot of time studying the camera and setting up the photograph. She checked each photograph after it was taken and decided whether or not to delete it or keep it. There was a lot of interest in selecting photos and sharing photos on viewing lens of camera in this little group. (Researcher Journal)

The photographs in Figure 4.20 show the children using the digital camera to photograph themselves during Christmas play. By this stage of the year the children were very comfortable being photographed by each other and the camera was seamlessly integrated into the play. Researcher notes show that as the imaginative play episode drew to an end the conversation in the group shifted to the photographs taken and the arrangement of children in the photographs:

The group of friends then started to pose in different positions. The camera was just part of their Christmas play. Their topic of conversation was the photographs they had taken in costumes. Children looked at the photographs through the viewing lens. They were particularly interested in talking about the posing in Christmas costumes. Children deleted some photographs and took others after viewing them. (Researcher Journal)

Learning Episode 9: The Typewriter

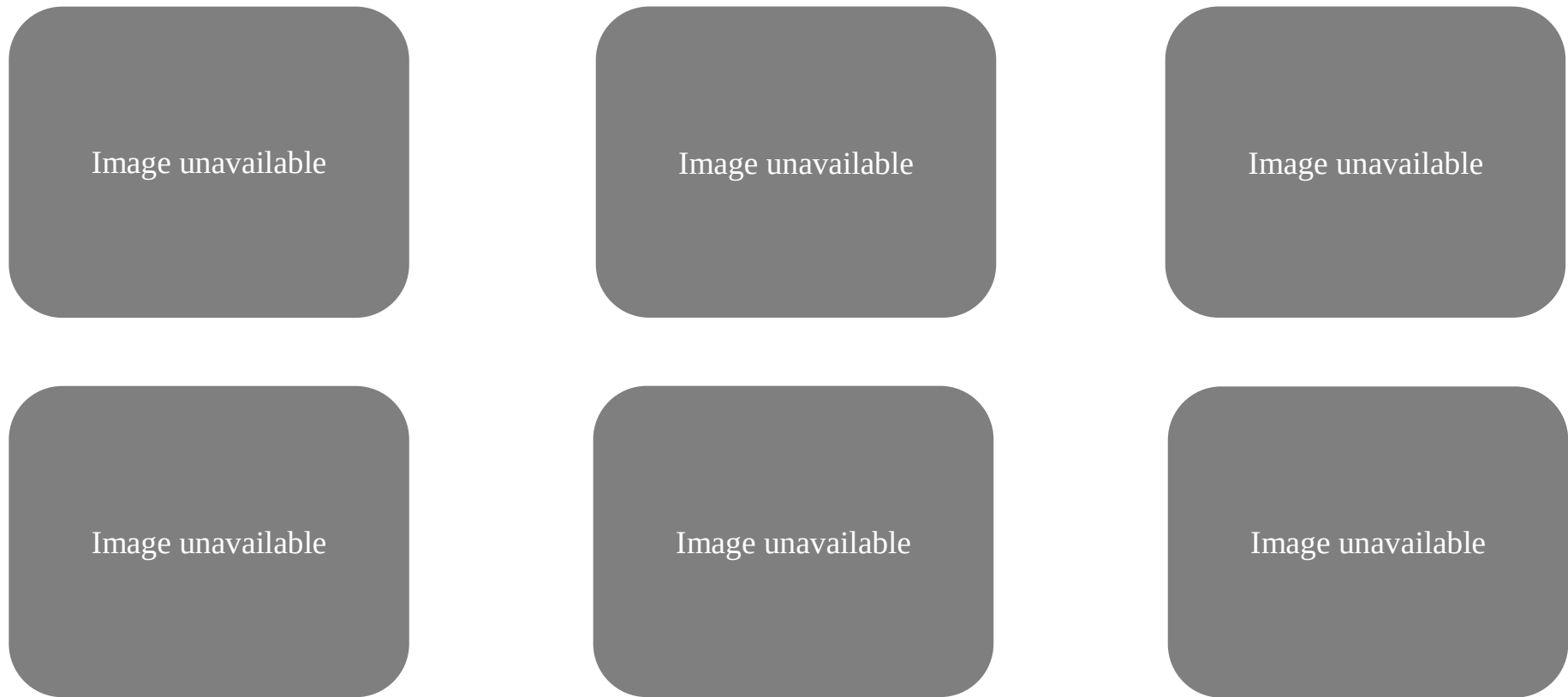
Following on from the success of the digital camera in the classroom Susie introduced some ‘old’ technology for the children to explore. As most of the children had never seen an electric typewriter before it created a great deal of interest among the children. Susie was interested to observe the different reactions from the children; some children thought it was a kind of computer and wanted to know where the screen was and others just pressed the different keys to see what would happen:

The introduction of the type writer created lots of questions:
What is it?
How do you use it?
Where is the screen? (in comparison to the computer) (Susie LSJ2, p. 3)

To begin with many of the children began their exploration through pressing the buttons to see what happened. They soon found that when it got to the end of the page the typewriter would beep and not do anymore – some continued to press the buttons until they found that the return button got them back to the start while others asked what they had to do. (Susie LSJ2, p. 3)

FIGURE 4.20

Children incorporate the Digital Camera into their Play



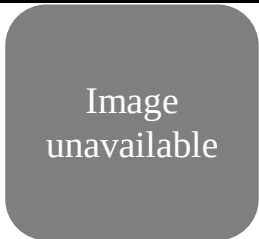
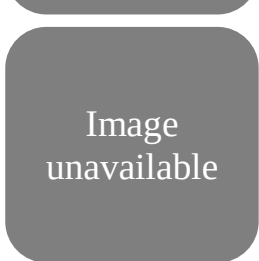
Given the time to explore the ‘old’ technology the children took the learning in different directions. Susie found that the children used the typewriter to express their ideas and were then eager to communicate to others. An excerpt from Susie’s LSJ (*Figure 4.21*) shows how some children used the typewriter to practise letter identification, another child found that he could manoeuvre the paper around and create a pattern, and yet another child connected his exploration and learning to his imaginative play and used the typewriter to create five golden tickets to his chocolate factory.

In the final interview Susie noted that each of these children had used the typewriter to express an idea; to share letter knowledge, create a pattern and to type an invitation to play:

I’ve got Joseph who was using it to create 5 golden tickets, he’d seen Willy Wonka and the Chocolate Factory, and then I’ve got this great photo you can actually see in William’s picture he’s actually used it turning it up and down creating with the letters and actually made patterns on the paper. So the photo came out really clear of himself and what he had done. I hadn’t thought of that. So he’s used it creatively, like moving it [paper] up and down to see what patterns he could make out of it. (Susie F5, p. 1)

FIGURE 4.21

Excerpt from Susie’s LSJ2, p.3

Commentary of Critical Incidents	Artefact
After the initial exploration the children used the typewriter to express many different ideas: • George & Chad looked for the letters of their names • Joseph used random letters to represent those needed to create five golden tickets (although he did find the number 5 and ask how to spell tickets). He then used this paper to invite friends to come and play in his chocolate factory. • William used the letters and the movement of paper to create a pattern.	 (7) Chad & George exploring the letters on the typewriter  (8) Joseph making 5 golden tickets – recently saw ‘Charlie & the Chocolate Factory’ movie  (9) William proudly showing the pattern he made with the typewriter

Learning episode 10: Talking Books in the Reading Corner

Technology in everyday play continued to be embedded in the kindergarten program. After purchasing some CD-ROM talking books on DVD of well-known favourite stories Susie decided to introduce a portable DVD player to the children and she observed how they responded to a new option for listening to and sharing stories:

While on a shopping trip I came across a collection of well-known books with DVD's (such as *We're going on a Bear Hunt*, *Little Rabbit Foo Foo* etc.) – I was interested to see how the children could use these as an extension to our book corner. (Susie LSJ2, p. 4)

What was initially surprising to Susie was the popularity of the portable DVD player. Susie observed that with the introduction of the DVD player a number of children who were usually not interested in books were eager to spend time in the book corner:

It drew a number of children who don't often spend much time in the book corner and it created quite a lot of discussion, either during or at the end of the story – such as Holmes & Fred. The discussion related to what was happening in the story or working out where the corresponding page was in the book. (Susie LSJ2, p. 4)

The introduction of the DVD player to the book corner prompted a further social opportunity for the children. Susie observed that children engaged in dialogue about the story, about the book and what they saw on the screen, and the technical aspects of making the technology work correctly:

...some of the children focused solely on the pictures on the player and others incorporated it with the book and the discussion that went on. (Susie F5, p. 1)

The many and varied social interactions by the children using the DVD player were also noted by the researcher: "children sitting in pairs on the desk watching and talking to each other about the story as they listen" (Researcher Journal). The photographs in Figure 4.22 were taken by the researcher on the day that the DVD was introduced to the children. Researcher notes from the observation day also corroborated Susie's observations of the children's preference to be with friends while listening to the DVD and showed that the children explored the technical aspects of the DVD player cooperatively:

Susie has introduced portable digital DVD player and children have been shown how to use it. Children now operate it themselves after introduction. There is an e-book on the DVD. Children listen to the story in pairs. It is self-directed activity and hard copy of the book is also at the player for the children to use. (Researcher Journal)

FIGURE 4.22

Working with the Portable DVD Player



Susie encouraged the children to take responsibility for problem solving any technical issues that arose with the portable DVD player. An excerpt from Susie's LSJ in Figure 4.23 shows that once the children could operate the DVD player effectively they clearly enjoyed listening to the same stories over and over again.

FIGURE 4.23

Excerpt from Susie LSJ2, p. 4

Commentary of Critical Incidents	Artefact
The sound was initially set rather low – many children (11) were quick to find out where the volume was and turn it up – sometimes it was a bit loud and they needed a reminder to turn it down!.	 10. Holmes & Fred enjoying the Rabbit Foo Foo story
While I had a selection of over 10 books & DVD's we only used 2 as the children continued to revisit these stories and began to read along with the story (11)	 11. Harry & Bill revisiting the Rabbit Foo Foo story on the DVD player

The children's willingness to persist with difficulty and take responsibility for problem solving was also noted by the researcher:

Two children, Anna and Fred, worked out how to play the story again. They watch it [DVD] again together, talked about the story and the pictures and the screen- engaged in the story a second time- no apparent loss of interest. Fred picked up the book to find matching page to the page on the screen. Anna and Fred looked at the book and the screen together. Anna preferred to look at DVD. Eventually Fred moved to another activity. Anna stayed until the end before turning it [DVD player] off and moving on. (Researcher Journal)

Routines that were evident in other areas of the kindergarten seemed to be embraced by children using the DVD player. The researcher observed a child, without being prompted or asked, wait patiently for a turn with the portable DVD player: "Anna moves in and uses the DVD player. She waited patiently

for boys to finish then sat down to have her turn” (Researcher Journal). On another observational visit the researcher noted the way that the children helped each other when technical difficulties arose with the DVD player. Instead of seeking assistance from Susie the children sought help from a classmate to solve a technical problem:

When I [researcher] was observing the children a technical difficulty arose with the portable DVD player. Battery not working – one child passed it on to someone else (*an expert*) to check and this child fixed the problem and the DVD player worked again. (Researcher Journal)

Learning Episode 11: Technology in the Transition to School

As the end of the year approached the children’s conversation began to involve school; school names, orientation sessions and who was going where. Susie decided to ask the children to create a picture to show what they hoped they would do at school and this generated further interest among the children:

The children were asked to draw a picture of what they think they would like to do at school (12)– this created a lot of discussion about not only what they think they would like to do at school, but also about what they already knew (particularly from children who have older brothers and sisters) (Susie LSJ2, p. 5)

After discussion between Susie and the researcher it was decided to collate these photographs of the children’s art work as part of a communicative process to be set up between the children from Centenary Kindergarten and the Preparatory children from St Stephen’s Primary School. Given the short time frame that existed for this communication to occur the researcher was enlisted in digitally recording the children’s thoughts about school to be collated with the children’s art work and compiled as a multimedia presentation. On a designated day the researcher recorded, using a digital recorder, with small groups of children the ideas expressed in their art work as they talked with each other. The multimedia presentation was then passed on to Susie for sharing with the children and sending on to St Stephen’s. Using the notebook computer Susie then showed the children the presentation and left the notebook computer set up for the children to further explore the presentation during the session. Previous to this the children had used the notebook computer as a technology learning centre for playing an educational software game but had not used it to run multimedia software created from and for the children’s interests:

Once Kate [researcher] had recorded their thoughts and put them all together as an e-book which I introduced to the children and told them it was on the computer for them to take a look. (Susie LSJ2, p. 5)

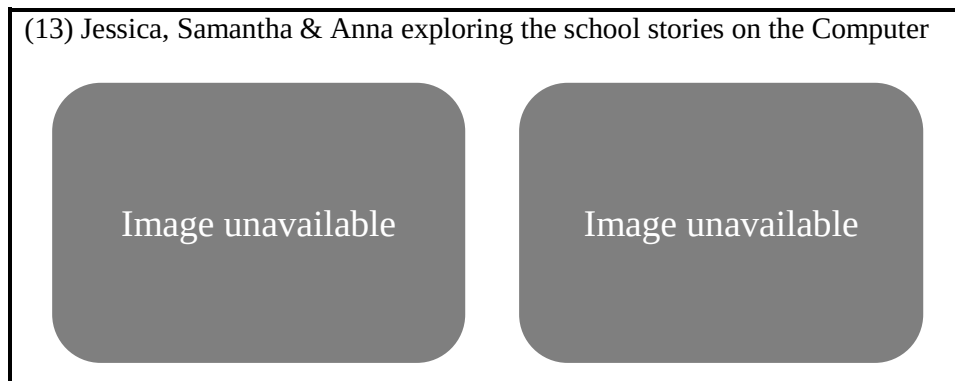
When left to view the multimedia presentation during the session it was not long before a problem arose:

After a while I noticed that the children weren’t staying at the computer and exploring the book for very long – it wasn’t until Jenna, Samantha & Anna came and told me that they couldn’t hear it. This led to some discussion and a hunt through the cupboard to find some head phones – problem solved! (Susie LSJ2, p. 5)

Susie noted that the children demonstrated responsibility by seeking assistance with the technical problem and it was quickly solved. The excerpt from Susie's LSJ in Figure 4.24 shows three children exploring and talking about the presentation together, highlighting the social rather than solitary nature of the activity.

FIGURE 4.24

Excerpt from Susie's LSJ2 showing Children exploring the Multimedia Presentation.



The multimedia presentation further stimulated the children's conversation about transition to school and prompted Susie to give the children the opportunity to ask questions of the children at St Stephen's in anticipation that they would receive responses to them:

Exploring the idea of school transition further the children were asked to think of a question to ask the children at the St Stephen's Primary school. It didn't take the children long to think of questions – they dictated it to me as I typed it out. (Susie LSJ2, p. 5)

Notes from researcher journal taken on this day indicate that the children worked with Susie in small groups to share their questions for the email communication:

Susie is sitting in the writing corner with the computer and a small group of children. They children are sharing some questions they have about school and Susie is typing the questions on the notebook computer. Children check the typed questions with Susie to make sure it contained their intended message. (Researcher Journal)

When the children's questions were collated and it was finally time to send the email the internet presented some challenges:

We then set about setting up the internet for the children to send their questions – this is where I had to persist with difficulty as the internet didn't want to work when I wanted it to! Joseph took this opportunity to discuss how his internet doesn't always work but when it does it is great as he can play games on it and sometimes he beats his sister Rachel in the game they play! (Susie LSJ2, p. 5)

Susie's persistence proved worthwhile as she noted: "We eventually got it working and sent our questions" (SusieLSJ2, p.5). For some of the children internet problems were familiar and the episode prompted further talk. Unfortunately, the communication with St Stephen's did not extend beyond the

initial communication as the kindergarten and school year drew to a close. However Susie noted in her LSJ that the children received responses which they took home to share with their families:

St Stephen's replied to the children's questions through writing and pictures – the children took these home to share with their family (due to lack of time at the end of the year). (Susie LSJ2, p. 5)

Susie described the responses as 'amazing' because every kindergarten child had received an individual response to their question and ended up with a reply to share with their families:

...each child has actually answered one question each. So they've actually directed it to the children so our children will be able to actually take this home and also show the parents. I will put a letter with it explaining what we've been doing and what we've got back. I haven't read through them all but they're just amazing. (Susie 4a, p. 1)

On a personal level Susie believed that the email communication between the children at the kindergarten and the school had benefits for her personal learning:

I found it really interesting also asking the children what they thought of school, or what their questions were, because we think so much of the transition to school, we think of what they need, but we don't really ask the children what they think. (Susie F5, p. 3)

Susie felt that the decision to set up the email communication prompted her to consider what the children might want to know and to see the whole process through the children's eyes:

...it was in the idea of communicating with St Stephen's that we thought to ask the children whereas previous to that I haven't asked the children in the past. (Susie F5, p. 3)

Although Susie articulated in her initial interview that she planned for child-centred learning this learning episode highlighted the importance of finding out what children want to know, need to know and already know. For Susie, using the knowledge children bring with them to learning was something that she would take from the preceding learning episode into others. In the next learning episode Susie integrated this understanding and revisited an earlier desire to use digital photography from the children to create classroom reading material.

Learning Episode 12: Creating a Vet Story and Veterinary Play

While Susie and the children were preparing for communication with St Stephen's Primary School, they were concurrently involved in using technology in another part of the program. The children had been on an excursion to a veterinary clinic and were developing a class book of their experiences. Previously Susie had always found this a difficult task to do with a large group of children, but this time she decided to use technology to assist in the process:

In the past, after an excursion we have created books using photos from the excursion – this can often be tricky as a large group experience as not all children can see. I thought a great way to address this issue was to use the projector and laptop and put it on our white board for all to see. (Susie LSJ2, p. 6)

Some children immediately made connections between the projection screen in the kindergarten and others that they had seen and this prompted a discussion about the children's experiences with electronic whiteboards or 'Smart boards':

'We have our own Smart board' Joseph said as I [Susie] was setting it up, this then led to a big discussion about smart boards and brothers and sisters schools and what they use them for. (Susie LSJ2, p. 6)

The children contributed their ideas to the whole class story and some were eager to make additional contributions on the technical aspects of using the computer to type the story:

The children all became involved in the discussion with lots to recall about the excursion. They all thought it was pretty funny when my typing went over the page – I asked if I should make the writing bigger or smaller to address the problem and got a big response SMALLER from the children. (Susie LSJ2, p. 6)

When the whole class story was completed Susie was able to provide each child with their own copy of the story to use in different areas of the kindergarten and to take home and share with their families. For Susie, this was a considerable benefit of using the technology in this way that she had not experienced before when creating class books:

At the end of creating the story I told the children we could photo copy it so they could take it home – I think they were pretty impressed with this. The next day with the children, we laminated and bound the book which the children then took into the vet corner and often used it in their play to revisit their visit to the vet. (Susie LSJ2, p. 6)

Susie's LSJ entry shows the class creating the group story and an example of one of the pages of the book that the children created (*Figure 4.25*):

The researcher recorded in the researcher journal how Susie went about organising the learning environment for this learning episode:

Back at Kinder Susie set up overhead projector and computer and children dictated a story about the vet visit to her. Susie recorded the story so that the children could see it. She then printed off a copy for each child to take home. (Researcher Journal)

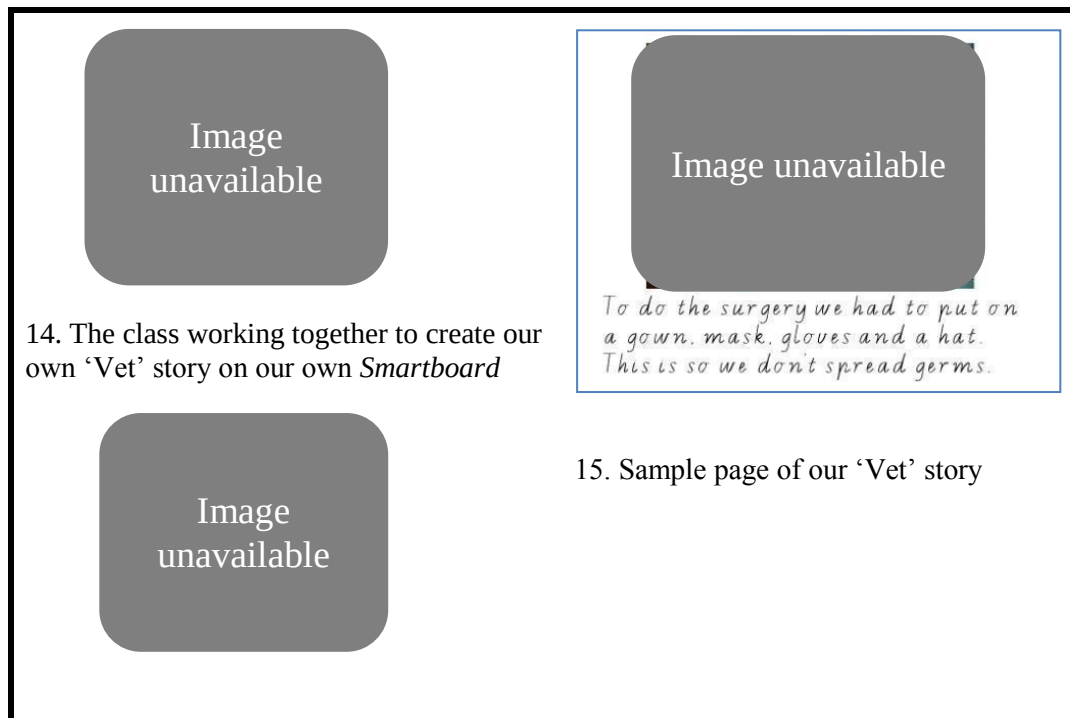
In a follow up discussion after this learning episode Susie highlighted to the researcher that the PowerPoint e-book was an expression of the children's ideas and the popularity of the book was such that the children read it over and over in either the digital format, or in the printed format in different parts of the kindergarten:

Susie found the integration of technology into the learning episode of creating a whole class book to be a powerful learning experience for the children. Susie was particularly interested in the talk that was generated from this experience and used it, as an example to show 'how' and 'why' she integrated technology into the kindergarten program, at an information night for the next year's kindergarten parents:

I mentioned about the smart board. I actually gave that example too, how when I had it up the children said, *'Oh we've got our own smart board'* and those that have got older children at the school said, *'Oh yes, they know all about that'*. (Susie F5, p. 4)

FIGURE 4.25

Excerpt from Artefacts Column in Susie's LSJ 2, p.6



As the study progressed children combined a mixture of real and imaginary technology into their play. A researcher journal entry illustrates how the children took the mobile phones with them from one activity to the next, moving in and out of play with them:

Some children are playing with mobile phones. Some put them in back pockets and handbags as they move from one place to the next, from one activity to the next. Children move between areas and the mobile phone goes with them. They return to phone activity intermittently as they engage in other activities. (Researcher Journal)

For Susie, "how the children have incorporated all this technology into their imaginary play" (Susie F5, 3.50) following the vet visit was of particular interest:

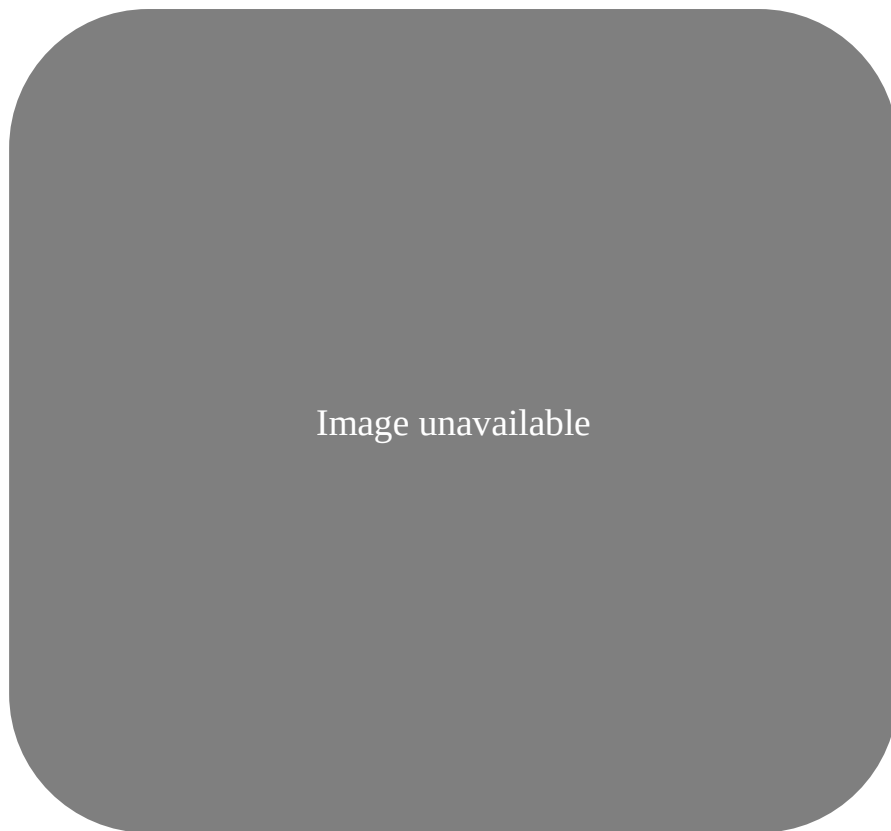
They don't necessarily have to have the hardware, I suppose, to use, and one of the ones I was could think of was how they were using the e-mail in the Vet corner ... (Susie F5, p. 1)

After the excursion to the Vet clinic the children set up their own vet clinic in the 'Home Corner' of the classroom. The play episode involved a group of four children wearing vet masks and dress ups and tending to sick stuffed animals. As the play progressed one of the children heavily involved in the play sat down at a table where an old computer keyboard was set up with a mirror

behind it (*Figure 4.26*) and typed on the key board before stating, “I’ve just emailed something” (Researcher Journal). As the play progressed the same child then made a call on a mobile phone [display model phone from Telstra] and exclaimed, “Everyone needs a phone if they’re a vet!” (Researcher Journal) and promptly re-entered the play with his peers by saying “Get back to the surgery” (Researcher Journal). The photograph in *Figure 4.26* was taken during this play episode and shows the child typing his email during the vet play.

FIGURE 4.26

Sending an Email during Vet Play Learning Episode



Following the observations that were made of the children integrating technology into their imaginary vet play other examples of the children integrating technology in this way were noted by Susie and it became evident that the children were exploring their understandings of these different forms of technology through their imaginary play.

Learning Episode 13: The Cash Register

In another learning episode Susie observed the children’s integration of technology into their imaginary play in a grocery shop that had been set up by the children. In the example from Susie’s LSJ

(Figure 4.27) Susie described the children creating their own cash register for their play in the shop corner and noted the way in which the children continued to use the register in their play for several weeks.

For Susie, one of the significant aspects of this learning episode was the way in which the children’s knowledge of technology in the real world was used to create technology in their imaginative play:

I didn’t have the registers out I actually let the children set them up with me and then they created their own cash registers with the boxes. So even though it was technology they were creating their own and using their imagination with it. (Susie F5, p. 2)

FIGURE 4.27
Susie’s LSJ2, p. 7

Commentary of Critical Incidents	Artefact
The children’s use of technology extended beyond using the physical ‘hard ware’ – they incorporated it into their imaginary play. The children had shown an interest buying groceries for the home corner so I decided to expand on this with the introduction of a shop corner. The children helped to set the shop corner up by putting items on the shelf, while doing this Richard noticed that there wasn’t a cash register so I asked what did he think he should do (thinking he would ask for one out of the cupboard) Richard thought that he could make one at the pasting table – so he did. When the children began to play Richard found that it was a little hard to share one so he went and made another cash register. The shop corner was set up for over a month and sold everything from groceries to mobile phones – every shop assistant used Richard’s cash registers, knowing exactly what they were.	Image unavailable (16) Shelley & Jenna in the shop corner serving Gayle, Esther, Ellie & Samantha using the cash registers created by the children out of boxes

Learning Episode 14: Annie.com

In the next observational visit to the kindergarten Susie was keen to share with the researcher a story from a parent. As noted in the researcher journal one of the children had been busy drawing at home and the mother asked the child, “What’s the picture?” To the surprise of the parent the child responded, “*It’s not a picture. It is Annie.com.*” The parent knew that the children had been working with technology at the kindergarten and thought that we may have been interested in this story. She offered to ask Annie to bring in the *picture* to show Susie but it never arrived.

Learning Episode 15: Puppetry and Song

In her LSJ entry (*Figure 4.28*) Susie described another way that technology had been integrated into the kindergarten program in the final cycle as stemming from the children's interest in puppetry and song. Susie presented a singing goat puppet to the children that sang the goat herding song from 'The Sound of Music'. Some of the children were familiar with the song and the movie. Susie brought the DVD of the movie into the kindergarten for the children to watch the puppet segment. This prompted talk about puppet making and the children became heavily involved in puppet making and presenting their own plays using the puppet theatre (*Figure 4.28*). From Susie's reflection on this activity it seemed that the children re-visited the musical segment throughout the learning episode:

The use of the DVD was very popular as through many requests we watched it a number of times and some were even able to sing the song by the end of the year. (Susie LSJ2, p. 8)

The musical theme continued in the kindergarten with the children's use of the compact disc player to play music for dancing to their favourite songs. The children's use of the CD player independently caught Susie's attention:

Looking at the way the children were able to work the Digital Camera I was confident that they could handle the CD player as well (which they sure could! I introduced a selection of CDs. The ABBA CD was the most popular – I had many children ask me to put on the 'Mamma Mia' song which I did, but sometimes I was busy so they would have to search through the songs themselves it wasn't long before Hamish worked out that the song was number 4 ... needless to say I wasn't required to operate the CD player after that! (Susie LSJ2, p. 9)

In the past Susie had exercised tight control over the music that was played in the music corner but the introduction of a small child friendly player had reduced the need for adult intervention in the play episode:

Previous to this year I would have music on in the music corner but they [the children] only had the big stereo so they had to ask me to change it and everything, whereas this year we had the small one. Just their ability, they would ask a couple of times maybe how to use it and then they would go for it themselves, or they didn't need to find out. They would work it out themselves. (Susie F5, p. 2)

Susie believed that some of the independence and responsibility for learning that she had observed in the music corner had stemmed from the children's experiences using the digital camera. In her LSJ Susie provides a description of how the children took their learning from this experience out into the wider community. Some enthusiastic children had taken photos of the music corner and the CD player that they liked to use and Susie included these photographs in her LSJ entry (*Figure 4.29*). The children used the CD player to repeatedly play their favourite ABBA songs at the kindergarten and Susie's only cautionary preparation was to copy the original CDs and DVDs in case any mishaps occurred:

The CDs and DVDs I actually copied so that if they got scratched or wrecked I always had another copy I could get out. (Susie F5, p. 2)

FIGURE 4.28

Extract from Susie's LSJ2, p. 8

Commentary of Critical Incidents	Artefact
The children had been interested in 'Harry the Monkey' puppet all year (a puppet we spontaneously use at group time) so I introduced a new puppet who sang the Highland Goat Song (I think that is the name??). The children giggled and laughed at as he sang and some of the children said that they had heard the song before. So this led onto a discussion about the movie 'The Sound of Music' so it was decided that I would find it at home and bring it in to show them. After watching the DVD (the puppet & song section only!) for the first time we had a discussion about different types of puppets and how they work – this extended on to making puppets and playing with string puppets outside. While making the puppets inside the children chatted about the ones on the DVD as well as other puppets we have at Kinder. The children spent quite a bit of time working out how to make their own puppet before playing with it at the puppet theatre. The imaginary play was more involved with the puppets outside – the children created stories about their puppets and interacted with each other's puppets as the stories unfolded. The use of the DVD was very popular as through many requests we watched it a number of times and some were even able to sing the song by the end of the year.	 17. The singing goat puppet that started it all!  18. Children watching the goat puppet show in <i>The Sound of Music</i>.  19. Fred creating his own puppet show with the puppet he made.  20. Children creating a story with the puppets outside.

The children's engagement with using the CD player to sing and dance to their favourite songs continued outside of the kindergarten. Two of the children got the opportunity to use their karaoke skills at a Christmas party outside of the kindergarten when ABBA songs came onto the program. In her description below Susie describes how the children were empowered by the experience:

The learning extended outside of Kinder – a parent shared her story of how a few of the families were at a Christmas party and the older children were playing 'Sing Star'. The two Kinder children were feeling left out as they couldn't read the words but that soon changed when ABBA was put on – they then took over as they knew the words from singing them at Kinder so often! (Susie LSJ2, p. 9)

As the year drew to a close the digital camera and the various forms of technology that Susie had introduced continued to be integrated throughout the program. By now the children were very familiar with the technology and were finding many ways to include technology in a variety of forms into their play.

FIGURE 4.29

Extract from Susie's LSJ2 p. 9

Commentary of Critical Incidents	Artefact
The music and dance corner was a popular place for the children to play throughout the year (21). To begin with I would place the CD in the player and the children were allowed to press play when they wanted it to start. As time passed the children began to share their interests in music a lot more – one of the most popular songs sang was ‘Mamma Mia’ (Taking an interest). Looking at the way the children were able to work the Digital Camera I was confident that they could handle the CD player as well (which they sure could! – Taking Responsibility). I introduced a selection of CDS (21). The ABBA CD was the most popular – I had many children ask me to put on the ‘Mamma Mia’ song which I did, but sometimes I was busy so they would have to search through the songs themselves (Persisting with Difficulty) – it wasn’t long before Hamish worked out that the song was number 4 ... needless to say I wasn’t required to operate the CD player after that! (Taking responsibility) The learning extended outside of Kinder – a parent shared her story of how a few of the families were at a Christmas party and the older children were playing ‘Sing Star’. The two Kinder children were feeling left out as they couldn’t read the words but that soon changed when ABBA was put on – they then took over (Being Involved) as they knew the words from singing them at Kinder so often!	 21. Photo of the music corner with the CD player and CD selection  22. Children's photo of the CD player on their favorite song – number 4 ABBA (Mamma Mia)!!

Learning Episode 16: The TV Camera

The final commentary recorded by Susie related to an episode that occurred on the last day of data collection for this study. A video camera was set up in the classroom to record the children as they played. Susie noted that “they [the children] are used to camera in the room” (Susie LSJ2, p.11) so for the most part they were ignored by the children. However the static video cameras managed to arouse the interest of one child whose attention was drawn to what he could see through the viewing lens of one of the cameras. He organised a group of his friends that he had earlier been working with

at the pasting table to create a television, to film their television and side show in front of the video camera:

George walked behind one of the cameras and began to talk about what he could see. Earlier on George, Joe & Richard had been busy at the pasting table making TVs (sticking pictures on cardboard or boxes) – George went and got his TV and with a group of friends they decided to film their own TV with the camera. (Susie LSJ2, p. 11)

When they noticed the camera was moving when the children playing nearby knocked the tripod George asked the children to move away so that they could continue with their filming. Susie noticed that the conversation between the boys as they engaged in this process focused on the organisation of the group and the expression of their ideas and thoughts about such things as why the camera kept moving. Susie noted that the significance of this learning episode for oral language development was in terms of

...expressing their ideas to each other of who can do what and expressing their thoughts of what to do next and working out that if too many stand behind the camera you can't see and there is no one in the front to hold the TV up. (Susie F5, p. 5)

Unfortunately, this episode occurred at the end of term and which meant that there was no time left to explore this new area of interest further:

I would have loved to see how the play would have progressed but as it was the last week of Kinder for the children we weren't able to extend on this learning opportunity. (Susie LSJ2, p. 11)

4.5 Susie's Final Reflections

In her final interview Susie noted that time was one of the biggest issues she faced throughout the project and particularly in the second cycle:

To begin with when the camera was first introduced it was having time to explore it because there were so many that were wanting to use it. And also the time frame with e-mailing St Stephen's if we'd been able to do it a bit earlier we could have expanded on that a lot more. (Susie F5, p. 2)

However, while time constraints were seen as a challenge when working with technology it was not a deterrent from continuing with the technology in her program. In summarizing her intentions for the following year Susie stated:

I definitely want to continue next year with introducing the digital camera to the next year's children, use of the internet and e-mail... (Susie F5, p. 3)

The experience for Susie had been positive and although a self-confessed 'Gadget Girl' Susie believed that through her involvement in the study she had been challenged to extend on her thinking and practice further:

...it's [technology] always something I've been interested in, but I think in doing this I have had to make myself bring it out more as in think further. What can we do? How

can we extend on this? Whereas before hand I would have still included the cameras as I had already bought it, but how I used it may not have been as advanced. (Susie F5, p. 4)

Well it's positive. We'll continue it on. We've always had a little bit of technology but this year we've been really...been able to expand on that [technology] and include it more in the program. (Susie 4a, p. 2)

When Susie was asked about key areas of her learning throughout the study she reflected on what she had learned about the children. Of particular importance to her was the way in which her involvement in the study had highlighted that when it comes to technology children are capable learners. Susie lamented:

Never to underestimate the children, and things that you thought, '*No, children can look at but not touch*'; they are quite capable of doing things themselves. (Susie F5, p. 1)

One of the biggest unexpected outcomes for the children's learning that Susie noted was related to the directions in which the children took their learning. Susie noted that "they [the children] have all taken their own initiatives and their own learning styles" (Susie F5, p. 5) in their exploration of technology, but the unexpected element in this process was the social aspect of the learning:

...seeing the children finding things out for themselves like the orange photos when they learnt that was their finger over the lens and the social side of it in organising their friends for group photos. I hadn't really thought that much. I thought it would be more taking photos of what they've done, what they've made, so they've got a record of it. But the children took it more the social side of learning, like having photos of friends. (Susie F5, p. 4)

Susie identified that the strongest literacy learning threads were stimulated through the social interaction with technology that she observed in the children throughout the second cycle:

I think it [children's learning] has continued in the oral language, also I suppose in following instructions as well in the use of the printing and the digital frame, what they have to do and what come next, so the sequence of what needs doing. Yes, probably more oral language [learning] than anything else. (Susie F5, p. 5)

In preparation for a meeting with next year's parent community Susie decided to include in her presentation some information about the way she has been incorporating technology into her program. She drew on her professional learning from the action-reflection cycles and working the researcher to inform her presentation:

...I was going through the presentation that I give and I always like to change it around a little bit, especially for those parents that are coming back and come along to the information night, so it's not the same thing, and I thought about what we have been doing this year. I added the arts, because we do a lot in relation to the arts, and this year I added a whole section on technology and spoke about what you've [researcher] been doing and how the children have embraced it. (Susie C4a, p. 1)

Armed with knowledge of key benefits for children's learning that the infusion of technology into the kindergarten program had produced, Susie was able to respond to parent questions and answer any

concerns that families had about technology in the kindergarten program. One parent in particular was concerned about their child's minimal experiences with technology and whether this would be a disadvantage. Susie responded to the concern of the parent by talking about how the children had learned with the technology throughout the data gathering of the study:

I spoke about what we'd been doing and how the children had taken it on board and I made a joke with Jill. How they've learnt to ask me rather than Jill because Jill is still learning; well I'm still learning too... And then I spoke about how the children learn from each another, and how some come in. You know they've been using a computer since they could sit on their parents lap right through to only seeing them out in the shops and that kind of thing, and how it doesn't matter where they come from, they all go at their own pace. (Susie F5, p. 4)

Susie described the parents' response to this as "really positive" (Susie F5, 13.41) and noted that it stimulated a worthwhile discussion.

Reflection Illustration: Santa's Learning about Technology

As part of her final reflections Susie shared one last example from her classroom that occurred on the last day of kindergarten for the year. For Susie the example highlighted how embedded in the children's lives technology is and how strongly this embedding is related to their generation and not necessarily others. In her example Susie described how Santa came on the last day of kinder and was asking the children what they would like for Christmas. The problem was that he did not know what many of the items the children were requesting actually were and Susie found she had to step in and provide an explanation of these requests for Santa:

It was interesting when Santa was there. I [Susie] had to interpret a lot of the toys for him because he had no understanding of what a DS was. I said, 'Oh it's a game console, Santa'. The amount of children who want a DS for Christmas or a play station or an Xbox... and he's going, 'okay'. (Susie F5, p. 6)

In this example and the Ellie.com example described earlier in the chapter Susie believed that the children may not fully understand the technology but "they know what it represents" (Susie F5, p.6) because it is a part of their lives. In way of explanation of this gap in understanding that seems to exist Susie likened to her experience of when computers were first introduced at school:

...I have been discussing this with friends my own age talking about what we have been doing and with children it is just their everyday lives, but we can remember, I was in Year 9 when computers were first introduced to school, and you know we haven't grown up with the technology like children have - today's children. I suppose it's like generations ago with the TV. We've grown up with TV but past generations haven't. (Susie F5, p. 5)

It has really changed. It used to be really nerdy and geeks like only those brainiacs would use it, whereas now it's just part of everyday. (Susie F5, p. 6)

Susie believed it is the *everyday* that will continue to inform her approach to using technology in the kindergarten and the very reason why it must remain part of her program:

...I think it's really beneficial to include technology in the kinder program because it is so much part of the children's everyday life, and how the children have incorporated it into their everyday play, rather than this is our time to use technology, or this is just like snack time you have a set time with technology, it just encompasses everything. (Susie F5, p. 5)

The following section describes a child vignette taken from Susie's learning environment. This child demonstrated a particularly strong interest in using the technology throughout the data collection period of the study. The way in which this child engaged with the technology provided some insight into understanding how children may learn with technology and how Susie's mediation of technology may have assisted or impeded the symbiosis of literacy and technology in the classroom.

4.6 Vignette: George, the Curious Explorer

In the kindergarten learning environment George's interactions and engagement with technology were of particular interest to Susie and for this study provided an opportunity to observe closely the relationship between literacy and technology and how Susie's mediation of technology enabled learning.

George was a lively 4 year old boy at Centenary Kindergarten. He was one of the youngest children in the group and for this reason his parents had considered keeping him at kindergarten for another year before sending him to school. However, George demonstrated that he was an extremely sociable child and had no difficulty getting along with other children or forming friendships. In Susie's mind there was no doubt that George would go on to school the following year:

...he's an interesting one in that he's a younger child, in that he could have another year at Kinder before going to school and there's no way you could hold him back going on to school (Susie C3, p. 5)

Susie did not expect George to respond to the introduction of the digital camera in the kindergarten in the way that he did. Given his interest, or lack of interest, in the notebook computer that was set up with a software program for the children to explore Susie expected that George would continue to choose to engage in play experiences other than using the digital camera:

George hardly spent any time at the computer yet he has just latched on to the camera. He thinks it is absolutely fantastic... and really taken it on board. (Susie C2, p. 3)

George embraced the opportunity to use the digital camera and from the beginning was focussed in his use of it. On an early observational visit when the children were still learning how to use the camera and the printer "George was busy taking photos of people and things" (Researcher Journal) and selected his own photographs to print out with the distinct purpose of sharing these with his friends:

...I [Researcher] was fascinated with what he was actually choosing to print. Which to you and I looked like it was the back of a head, or something that was fuzzy and you couldn't even work out what it was. He knew exactly what it was and it was really important to him. I thought it was really interesting to just listen to him talk about why

he wanted that photo and even what he wanted to do with it, which was really just to go around everybody and show them. (Susie C2, p. 3)

Although Susie expected that with the introduction of the printer the children would take their learning in the direction of making books and recording messages about their photographs to share with others, George “did not seem to show any interest in making them into a book. He was more interested in talking about them and sharing them with others” (Researcher Journal). Susie summarised the way that George had taken his learning in a different direction to what she had anticipated by stating:

...like you’ve [teacher] got in your head, ‘*Okay we can take it and we can do this, we can do this, we can do this,*’ whereas he decided, ‘*No I’m going this way,*’ and that’s one of the joys with working with that age group. (Susie C2, p. 3)

George wanted to take photographs of people and things that were important to him and share these photographs with his friends. In the researcher journal George’s behaviour with the digital camera was described in a ‘photographer like’ way:

George was acting in a class photographer role. He was busy taking photos of activities other children were doing and showing each photo after it was taken to the children using the viewing lens on the camera. (Researcher Journal)

Researcher journal notes show that George was “happy to explore with the camera” (Researcher Journal) and through this exploration he worked out how to use the viewing lens to view his photographs and how to delete from the camera the photographs he didn’t want to keep (Researcher Journal). Through his enthusiasm George was also able to draw others into his play with the digital camera as they explored the camera together:

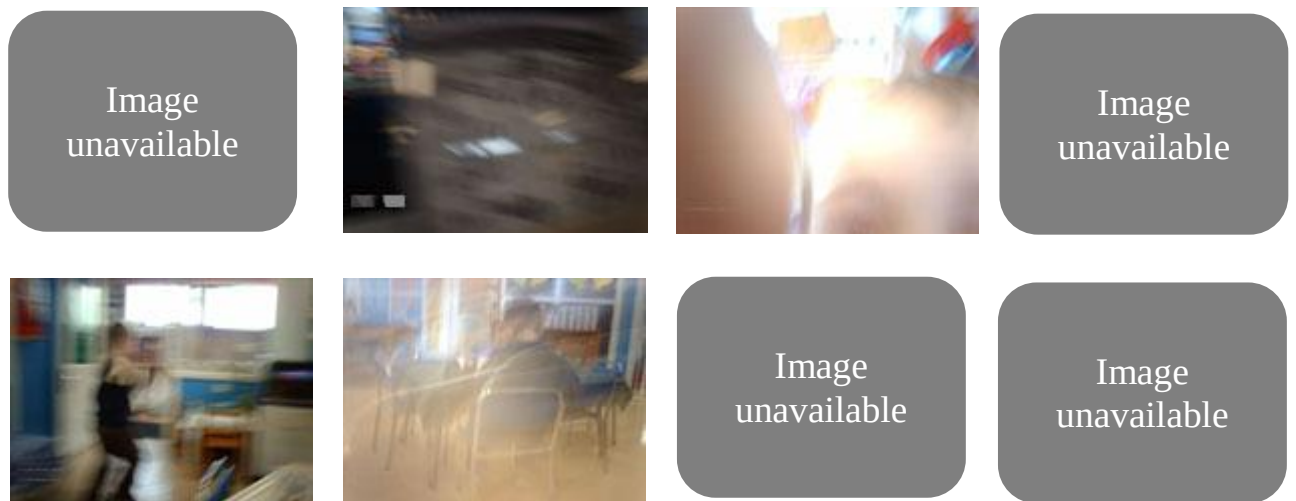
George and William experimented with different ways of taking photos – objects and people. They tried taking photos of moving people and objects as well as still photos. (Researcher Journal)

Figure 4.30 shows some of the photos taken by George and William as they experimented with movement of the camera, movement of people, still photographs and photographing through different textures.

When Susie introduced the memory cards, printer and digital frame to the group she observed that George took on a leadership role in helping others learning how to use the memory cards and change them around. Susie noted that “George is showing everyone how to do it so he’s the leader in that [changing memory cards]” (Susie C2, p. 4).

FIGURE 4.30

Photographs taken by George and William



As the cycle progressed George's explorations with the digital camera continued and he began to be more selective about the photographs he took. He was one of the first children to show some creativity in his photography when he took photographs of Susie taking a photograph of him:

...I've got quite a few photos of George involved with the camera; of him taking a photo of me taking a photo of him, (Susie C2, p. 5)

and always his motivation seemed to be to share his explorations with his friends whose interest further encouraged his behaviour. When reflecting on the first cycle Susie acknowledged the variety of responses from the group to the digital camera. Of particular interest to her was the way in which George was able to engage in learning with the digital camera in a variety of ways: "he is able to engage in so many ways as well with just his nature" (Susie C3, p. 5). During the Science Works excursion described previously (Section 4.4.1) George was the only child who took an interest in taking photographs at Science Works. George took three photographs early into the excursion but lost interest and gave the digital camera back to Susie to look after while he went off to explore Science Works.

Throughout the second cycle George continued to explore using the digital camera in a variety of different ways. A visit to the kindergarten from the local Fire Brigade prompted George to explore using the digital camera in a functional way that he had not demonstrated previously:

They were playing fire fighters at the time, I think it was George...in his play he was taking photos of the phone and the dial 000 and telling the kids what to do, so it was part of the play. It was not so much having to have the photos it was more part of their play. (Susie F5, p. 1)

George seemed to be using the camera to show his learning from the Fire brigade's visit and then using this new learning in his imaginative play. Susie recorded this observation in her learning story

and it is captured in the excerpt described previously in Figure 4.16. In the excerpt represented in Figure 4.16 Susie seemed to be intrigued by the way that George, using the digital camera, has seamlessly incorporated his cognitive learning from the earlier fire brigade visit into his imaginative play.

At the end of the school year when Susie thought that the children's explorations of technology were over. George surprised her by taking his interest in technology further to incorporate the video camera into his play. This learning episode has been described previously in Learning Episode 16. In this learning episode it was George who organised his friends to put the television they had made in front of the video camera to record a television program they created as part of the play episode. George displayed leadership in organising the group for recording and in problem solving when the camera was bumped and was not recording their television show.

4.7 Summary

There are a number of threads running through Susie's story that will be discussed in Chapter 6. The narrative has shown Susie's experiences of technology and literacy when walking with the researcher using a systematic intervention for professional learning.

In the first phase of the study Susie identified a relationship between technology and literacy that was centred on communication and meaning making. Her beliefs and assumptions about literacy and technology were holistic but she did not describe holistic technology practices. As the researcher walked with Susie and worked with her to enhance her practices, holistic technology practices began to emerge.

Throughout the action-reflection process Susie described learning episodes that were significant to her. These episodes showed children incorporating technology in to their play and exploring the use of digital cameras, printers, type writers, portable DVD players and email for communication. Susie noted that the play and exploration with technology was usually social in nature and enhanced oral language development. For Susie, an unexpected direction in the children's learning with technology in the literacy context was the way in which the children used the digital camera to communicate with images, to tell stories and to integrate the use of the camera into their imaginary play. Some children used the digital camera to take photographs that were then used to record a written message, but for most children the visual image was all that was needed and used for communication. Finally, through the action-reflection process Susie found that exploring with the one form of technology over an extended period of time her observations of the children moved from observing children's functional use of the camera to observing of a range of literacy practices with technology. It was clear to Susie that the children were competent users of technology and were familiar with the forms of technology used and their practices in everyday life.

The vignette of George highlights the high level of interest and motivation of one child in Susie's learning environment, and who was typical of many in the kindergarten. The vignette is significant because it shows the depth of George's engagement which Susie believed correlated with the learning experiences he had exploring with the digital camera.

The following chapter describes Mollie's story. In Chapter 6 the threads of these two stories as they relate to the research questions will be discussed in detail.

CHAPTER 5

MOLLIE'S STORY

The Lived Experiences of Literacy and Technology

Stories are the creative conversion of life itself into a more powerful, clearer, more meaningful experience. They are the currency of human contact.

Robert McKee

5.1 Introduction

Chapter 5 describes Mollie's story. The lived experiences of both Susie and Mollie occurred in parallel time however their experiences were unique to the context in which they were working at the time of the study.

5.2 Mollie's Learning Environment

Mollie had a Bachelor's degree in Primary education and was in her third year of teaching at the time of the study. She was in her first year of teaching at St Stephens as it was her first year in a Preparatory (first year of school) classroom and junior classroom. There was one other teacher at the school, Pete, and he was also the principal. St Stephen's was a newly opened school operating in a temporary site. Pete taught the children in years 1 to year 6. At the time of the study the new school was still under construction, being built in stages, and the population of the school was growing. Figure 5.1 provides a picture of the dimensions of Mollie's learning environment.

The School Program

At the time of the study St Stephen's was a new school. Pete, the principal, was eager to build a school culture conducive to learning for all children. For Pete, an integral part of the personalised learning approach that he wanted to embed in the school culture was technology. Pete identified technology as a gateway to learning and wanted staff to use technology in a way that personalised learning for students. At the time of the study the children had access to eight, Mac notebook computers and two I-Touches. This did not equate to one computer or I-Touch for every child and staff had to plan for children's access to the technology accordingly. There was not an electronic whiteboard at the school and this meant that if a projected image was required a notebook computer was connected to a portable overhead projector. Staff and children had access to a good quality colour printer that was shared between classrooms and administration.

FIGURE 5.1

A Snapshot of St Stephen's

Image unavailable



Mollie

- Had been teaching for 2 ½ years at the time of the study
- Bachelor of Education Primary
- First year at St Stephen's
- First year in a Preparatory (Prep) classroom
- Prior teaching experience in rural Victoria
- Was responsible for the technology at previous school

Staff

- 1 Principal / classroom teacher for children in year 1 to 5 (Pete)
- 1 Bachelor qualified teacher for children in Preparatory (Prep) year (Mollie)
- 1 Part-time administrative assistant

Classroom arrangement

- Preparatory (Prep) classroom with 14 children at the commencement of the study
- Year 1- 5 classroom with 9 children at the commencement of the study
- Open plan classroom arrangement
- Team teaching arrangement for part of each day
- Preparatory (Prep) children regularly worked with children in years 1 to 5 throughout the day in buddy arrangement

General information

- New school opened at the beginning of the year and student numbers steadily increasing throughout the year.
- Work on construction of the new school building to commence during the data collection period of the research study.
- Catholic school in regional city of Victoria
- Demograph from the immediate and broader community
- All children in years 1-5 had previously attended other schools
- No year 6 children at the time of the study
- Principal expressed and maintained a keen interest in the study
- Principal had personalised learning vision for the school

At the time of the study, personalising learning as a teaching and learning philosophy was new to Mollie. Alongside coping with the challenges that arise with teaching in a Preparatory (Prep) classroom for the first time, Mollie was also faced with the challenge of embracing a new educational philosophy.

The teaching and learning program at St Stephen's was driven by the inquiry focus for the term and Mollie planned for teaching and learning in her classroom on a weekly basis. At the time of the study Mollie ran a two-hour daily literacy block that was typical of many Victorian schools. At the beginning of each school day the children were involved in a one hour reading session and a one hour writing session. After a short play outside the children would return to the classroom for a maths session before lunch and the day would finish with an inquiry block in the afternoon. A similar program was followed in the Year 1 to 6 classroom.

The reporting program at the school was similar to that in many schools in the region where interviews and written reports were distributed to parents and guardians mid-way through the year. Accompanying each written report was a portfolio for each child that contained work samples across all areas of the curriculum for the current year. Assessment procedures were again similar to the majority of schools in Victoria following reporting requirements set out by the state government and the Diocesan Catholic Education Office. In the Preparatory classroom, the literacy assessment procedures included the Observation Survey (Clay, 1993a), running records and the use of moderated work samples and reading and writing progression points to determine student achievement.

Mollie's learning environment was brightly painted and had tables placed throughout the room in a group arrangement. These tables were not all rectangular shape making it possible for the group arrangements to have children working together in a circular arrangement. There was also a common learning space that was accessible for all children to use. In the learning environment children were encouraged to interact with the senior children in the school and to work together on projects.

The school principal was interested in the research study from the beginning and gave his full support for Mollie to participate in the research study. He expressed interest in participating in the study himself, but was unable to fully participate due to the demands associated with his role as principal, and responsibility for overseeing the construction of the new school. Pete expressed an interest in being involved in the research study to the extent that he was able and was willing to add the voice of both team teacher and school leader.

5.3 The Initial Interview

5.3.1 Mollie's Beliefs Understandings and Assumptions about Technology and Literacy Practices

During the initial interview Mollie spoke about a range of beliefs and assumptions that informed her practice. These beliefs and assumptions about technology and literacy practices have been summarised in Table 5.1 and they are described in detail in the following section.

TABLE 5.1

Overview of Mollie's Beliefs and Assumptions about Technology and Literacy Practices drawn from the Initial Interview

Beliefs and Assumptions about Technology and Literacy Practices (Mollie)
1. literacy learning should be purposeful and developed in meaningful contexts
2. children learn about literacy in integrated ways
3. children learn in communities of collaboration
4. literacy educators should show a passion for literacy education
5. it is important to provide scaffolds for children's literacy learning
6. children's literacy learning occurs at different rates and in different ways
7. literacy learning is paper based
8. classroom routines are important for learning and/or clear expectations support literacy learning
9. children learn literacy through following their interests
10. children should be given some responsibility for their learning
11. technology is a tool for teaching functional literacy skills
12. children should be given some choice and flexibility in the direction and focus of their learning
13. prior knowledge that children bring to literacy learning is beneficial to new learning
14. early years educators need to be well organised and prepared for student learning
15. skills based approach to literacy- functional literacy perspective
16. at times explicit teaching and instructions need to be given for children to learn literacy
17. early years educators should direct and control student talk for literacy learning
18. literacy learning should be fun
19. prescriptive view of technology - skills based

Mollie's passion for teaching and willingness to teach across a range of areas was evident in her first interview when she described a need to share an interest in teaching and learning alongside the children:

I've just got to be interested in what I'm doing because otherwise it shows and the children aren't interested either so and I get bored very easily. I'm like one of the children, I'm thinking no wonder they get bored half the time I'm not interested in what I'm doing either, so it comes through. I'm pretty happy teaching anything I don't really mind if I know what I am teaching. (Mollie I1, p. 1)

As a young early years educator Mollie acknowledged that staff assumed that she would know how to use technology, but she had other teaching interests also:

I don't really have a preferred interest though I like teaching most things. I know that I'm not quite as good in some areas as I could be but I don't really have a preferred interest. I normally get stuck with the technology area because I'm, that's a terrible word to use, but I normally get a lot of the technology things in schools because I am younger and expected to know more... (Mollie I, p. 1)

5.3.2 Pedagogy

When asked to describe how she believed children best learn Mollie described four key elements of her pedagogy. She believed the learning experience for the child should be authentic, purposeful, engage interest and take into consideration the prior knowledge of the learner. For Mollie, children best learn "If they are interested, if it's authentic," (Mollie I1, p. 1) and children "need to be able to see a purpose for what they are doing, if they can't see a purpose they're not going to bother trying" (Mollie I1, p. 2). Mollie considered student interest in learning to be fostered through 'inquiry' where the things children are interested in are integrated into the learning:

Generally a lot of the stuff that I find most successful is things that you do integrate as well that aren't just stand alone things; so if you're doing something that you're learning about it and it's linked to your 'inquiry' or linked to whatever. It's a good place to throw in some things that they never learn and it's to do with things that they're interested in and they know about, so it helps them learn too. (Mollie I1, p. 2)

Mollie used an experience in her classroom with 'Grandparents Day' as an example of what she believed to be an authentic, purposeful experience catering for child interests:

...like our 'Grandparents Day;' that was great last week and they learnt so much from that. It is not something that you can get them to 'Google' or something that you can get them to look up in a book. If it's something from somebody or something that they know that's how, and you should have seen from our displays some of the things that they learnt. If we had told them they wouldn't have learnt it but coming from other people and being prepared, going through the whole process. Now they are great at interviews, all these skills that they learnt and it was for a purpose. So if their learning's for a purpose and if it's authentic... (Mollie I1, p. 1)

On Grandparents day the children prepared interview questions and interviewed their grandparents about what it was like at school when they were young. The 'Grandparents Day' experience also highlighted to Mollie that children learn in different ways and that some will learn more from the experience than others: "everyone learns differently too. Obviously we had some children who didn't take in as much as some other children that day. Yes, it depends on the children too" (Mollie I1, p. 1). From a learning experience such as 'Grandparents Day' Mollie measured the success of the experience in terms of what the children could identify about their learning: "If the children can identify what they've learnt from it [learning experience]. If they can, if there are skills or something they've learnt that they can actually apply" (Mollie I1, p. 2).

Taking into consideration the prior knowledge of children and enabling them to use this knowledge to build new understandings was also important as Mollie believed that prior experiences and learning should be used for new learning:

...if they can bring their prior knowledge as well... If they start off and they've got some sort of understanding and then you can help them build on them and seeing that's sort of know that it's successful if you can do that. (Mollie I1, p. 2)

During the interview Mollie was asked about some of her less successful teaching and learning experiences and she identified a lack of organisation as being a contributing factor to the children not engaging in the learning:

...not being organised and not having a clear idea in your head? You can tell it's not going well when the children don't know what they are doing or they'll be sitting there and they've got a pencil in their hand and they don't know what they're doing. So you can tell from the children's reaction more than anything else and their body language and if they're sitting there talking to other people and they've got no idea what they are doing that's generally when you can tell. Oh, there have been plenty of those and you know and you've just got to pull the pin. (Mollie I1, p. 2)

Alongside good organisation, Mollie described the importance of a good explanation as contributing to learning. She used an example from her classroom to support this reasoning:

Not explaining, the explanation sometimes, assuming that they know more than they do and you've sometimes got to go back a step. Yes and even just with, well it's not literacy, but maths yesterday even just assuming the children, because we as a whole class, we went out and...did these counting of the cars and all that sort of stuff, and graphing them and that's fine, and assuming that they would understand how to depict a graph; one car represented two cars out there and then be able to take that step back... (Mollie I1, p. 2)

5.3.3 Literacy Beliefs and Assumptions

In response to the question, '*What does it mean to be literate?*' Mollie articulated that she believed being literate was about communication, with speaking and listening being paramount to the process:

It's [being literate] beyond just reading and writing even just being able to communicate so being able to, people generally say, I don't agree to, that the common notion that you are not literate if you can't read and write, because they can still communicate so that's a form of literacy, and speaking and listening is one of the most important things, because reading and writing is based on your speaking and listening so if you can speak and listen then you just develop, I suppose, reading and writing is just another area that can develop of that [communication] too, so any of those areas. (Mollie I1, p. 2)

Mollie's literacy learning goals for the children were also related to speaking, listening, reading and writing. However she believed these goals could not be reached unless children were motivated to learn:

The goals for their literacy learning generally for these Preps, it just to be able to be confident little readers it doesn't matter what level they're at, be confident and be happy; happy with the writing, happy with their speaking. Obviously you want them to be able to read and write at a certain level but as long as, if you can't motivate them well they're never going to move on. So, as long as they are happy with what they are doing and they want to be here and they want to read and they want write and your happy to have a bit of a chat with their speaking and listening that would be the

biggest thing. So you do want them, to be able to write on the lines have spaces between the words, write down the sounds they hear but only if they are happy to do that as well because if you force them to try and do that well they will be turned off. So, make sure it's enjoyable with what they are doing and they are having fun. (Mollie I1, p. 4)

Whilst motivation to learn was important, in practice Mollie also believed that it was her responsibility to provide learning experiences for children that were 'pitched' at a level not too easy and not too hard:

...you can't read before you know a lot of your letters as well and the sounds. Just not taking too big of a step just being in that area where they can do it, and that's sometime a hard thing to do. But making sure it is pitched right, pitched together. (Mollie I1, p. 3)

Mollie described 'language experience' as a strategy used in her Preparatory classroom:

I try to do a lot of language experience and a lot of talking about things, even just a book that we were doing today it was 'My Dog', and talking about what the children drew, and I normally try to have something they can touch...they drew a picture of their dog and then we had a big discussion and put words around their dog, just things they did with their dog; play, it wags its tail, just all the vocabulary we could come up with. So a lot of talking and explaining...Another activity was having the Lego and building something; what they did on the weekend. They'd have to explain to me what it was [pause] then really getting them to elaborate on it... (Mollie I1, p. 3)

It was all language experience about places we've been and things we've done and what we know about different things. The children would tell me about it, and then we'd write something about it. They'd be able to read it and they'd take it home and all that stuff, so they were reading and they thought that they were their 'readers' without even introducing them. They started to know a lot of the high frequency words we use, so even without getting out a book we did a lot of that. So you know lot of language experience and speaking and listening is a big part of that, we try to as much as you can. (Mollie I1, p. 4)

She also described key strategies used in the Children's Literacy Success Strategy (CLaSS) (Crevola & Hill, 2005) that was widely implemented in Catholic schools in the diocese at the time of the study, as the preferred literacy program for Catholic schools. CLaSS is a whole school approach to improving literacy using key ideas from the Early Literacy Research Project (ELRP) (Crevola & Hill, 1998) such as the incorporation of a daily two hour block focussing on literacy in the classroom program (Crevola & Hill, 2005). In particular, Mollie gave reference to the literacy strategies of 'guided reading' and 'modelled reading' in her classroom program. She also described the incorporation of 'group work' and word identification activities in her literacy program:

I still have the general CLaSS structure although it's not as much. It depends on what the others are doing, but we still need to have the literacy elements of the 'modelled reading', looking for strategies, you have your 'guided reading', and they still do groups. But no, it's similar to a lot of other classes, they still have their groups where they're doing their reading and looking at writing and a lot of things are the same. (Mollie I1, p. 4)

5.3.4 Technology Beliefs and Assumptions

During the interview Mollie was asked to describe her understanding of technology and her response extended beyond the 'digital' and was described in the classroom context: "...technology obviously with the I-Touches and the computers, listening to themselves read, but also with the things for their fine motor skills play, so Lego and even play dough and things like that as well" (Mollie I1, p. 5). In an example from the classroom she described how she used the I-Touches for a word identification activity:

But we use; I try to use the I-Touches and that, as much as we can to supporting listening. Yes, last week they were listening to a song and then they'd highlight the words that they knew on the sheet. So instead of just after having the song just having a sheet and highlighting any of the high frequency words, they could listen to it as they go as well. I just try and use those [I-touches] for little things to; listening to themselves read, we did that last week too. We recorded their April reading and then they listen to themselves and what can they do as a reader rather than just me taking them off or them going from what they just said. They can actually hear themselves read and then other children can give the feedback as well. We try to use technology but generally it's hard to do anything much different. (Mollie I1, p. 4)

In terms of a relationship between literacy and technology Mollie's responses indicated that she saw technology as a tool for the development of print literacy skills.

It's [technology] good and that's what helped support, rather than just reading and highlighting the words the technology was able to then help them, not have to play it on a CD player for everyone to listen to it, but they could just have it [I-Touch] and they had control over how they listened to it, they could pause if they want to at different areas, and all that sort of thing. They had the control over it [I-Touch] as well and this helped them they'd be listening to it and they'd be following along as well. So not everyone had to listen to it [I-Touch] and if a child had lost track of where it was they could pause and go back and so they had more control over their learning that way. So I am trying to do that as much as I can, but still trying, still developing obviously with our Podcasting and how we can do that better too. (Mollie I1, p. 5)

When Mollie was asked about the importance of technology for literacy learning her response was twofold. In the first part of her response Mollie alluded to an ethical obligation to ensure equitable opportunities for children in adult life:

...I think it's [technology] important not only to support their learning, but I think it's important for us to help them be confident, to be fair in the future, because they're going to be using it [technology] much more than we were when we were children, and by the time they grow up its sort of like you feel like you've got to make them confident and competent with using it [technology] as well. (Mollie I1, p. 9)

In the second part of her response Mollie reiterated a previously acknowledged belief that technology was an important tool for literacy learning:

It's [technology] the best, depending on what you use, the best tool to support their learning. It helps generally, helps make it interesting as well helps motivate them and yes, make it different from just having to write all the time or just having to read off a book or something all the time. A bit of variety too. (Mollie I1, p. 9)

As the interview progressed Mollie went on to describe what she believed was a successful teaching and learning moment with technology. In her recollection of the learning experience Mollie described the way in which she believed podcasting assisted the children to develop fluency and expression in their reading and her desire to take podcasting further in literacy:

...listening to their reading was good. I really enjoyed that because they could hear what competent readers should sound like too; because they'd practise the text and then they'd go to another text and be like, '*Oh yes, this is what I need to work on*'. They could hear each other and I was sort of a bit apprehensive of them listening to each other, but it worked really well because they were really good with their, '*Oh yes, you weren't quite doing this,*' and '*You didn't pause. What you could do is when you turn the page you could wait and read it*'. It was really good. And even just helping them [the children] when we went out to Blue Springs; listening to them [Instructions on the I-Touches] and... I've just been really happy with the way it has been going so far but I'd like to have a few more. Making the podcast was, 'Wow' I suppose; the very first one, and now it's like, '*yes, how can we improve this again? So we've done podcast, big deal, we've done a few of those how can we improve this [podcasting] and use this [podcasting] for not just reading*'. (Mollie I1, p. 7)

When asked how important she thought technology was in the early years classroom Mollie's response indicated that she believed technology had an important role to play in the development of functional literacy skills:

I think it's [technology] really good to be able to support their reading, particularly the listening; the speaking and listening. The recording, and so the listening of stories and following along, and songs and listening to themselves and competent readers and I think that's really good to help support their reading particularly in their speaking and listening. (Mollie I1, p.8)

Mollie further articulated that she would like to find ways to use technology with the children that fostered the development of writing skills:

I'm yet to find good ways to use it and I know that there is plenty out there, but yet to find good ways to use with writing rather than typing on the computer. I need to find something else. (Mollie I1, p. 8)

She identified the use of technology for writing as an area of further exploration for her own professional learning and for the children's learning:

That's an area I need to improve on...Some way to use technology to improve it [writing] because we can do it with the reading. We use it for the reading and we use it for the speaking and listening which are both areas you need to work on... (Mollie I1, p. 8)

In particular, Mollie was interested in exploring the integration of technology in ways that fostered writing development throughout the writing process rather than as an end product:

...but somehow rather than just using technologies just to type up whatever you've created; all of the text that you've created how do you use it? Well obviously they're the authors and they've done the podcasting and all that sort of stuff, so that's a good way of doing it for their writing, but I don't know if there's a [pause] I'd like to find some other ways rather than being a 'final'. At the moment it's sort of like the

technology is the reward for their hard work of the draft, and you know the pencil to paper, so that's like the reward for them. So if there's a way that you could use it throughout the process rather than just at the end. (Mollie I1, p. 9)

In the initial interview Mollie was asked about how she believed children should interact with technology in the classroom. Her response indicated that she believed technology should be part of the inquiry process and children should have time to explore and some control over what they do with technology in the classroom program:

There are some things that you need to have a certain amount of control over but it's good for the children to have control over it [technology] because you don't want, if it is a true inquiry, you don't have control over everything they're doing. You need to be able to know what they are doing and why they are doing it and if they can justify what they're doing, but if they decide to go on a different path or they've found something that they want to explore, well that's alright, that's fine. Yes, you shouldn't be telling them, 'This is what you should be learning'. I think you really need to let them develop it themselves and if they discover it themselves well they are going to learn it. Whereas if you show them what to do they forget what to do and they haven't really learnt it... (Mollie I1, p. 6)

When Mollie was asked to relate the way in which she envisaged technology use in her classroom to her current understanding of personalised learning her response indicated that she would expect the children to use technology in different ways according to their needs and that some children would be able to do more or less than others using technology, but still be guided in their learning:

...being able to show their learning through being able to use technology to show what they've done and being able to find out different things, different areas. Depends on the child too, some of them it could just be doing a simple podcast. It could be, '*You know, you can...*' it could be listening to them with their reading, like they will listen to themselves reading like we were talking about before. It sort of depends on the child and what they need as to what you would expect them to produce and expect them to get out of technology as well. Like some of the Preps you'd be happy if they can use an I-Touch, and they could drag photos and record, whereas some other Preps you would sort of try push them a little bit more too and if they were interested in it show them different other things or guide them, not really show them, guide them and let the other children do it as well. (Mollie I1, p. 7)

For Mollie, a personalised approach to learning with technology also meant that the children learned from each other and she noted in her response to the question about personalised learning and technology that, "they [the children] learn a lot from the senior children, a lot more than they learn from us, and they like to listen to the older children too" (Mollie I1, p. 7). Mollie made a similar observation in regard to her own learning with the Macintosh computers in which she noted that she had been "learning from the kids and that's been a good thing too" (Mollie I1, p. 6). Overall she believed the children had supported each other and other staff members in their learning with technology:

...the children are fantastic they been supporting each other and supporting us as well and Pam who doesn't know much of it [unfamiliar with Macintosh computers]. They've been really supporting her and a fourth year student that's come out and they've really shown her what to do. (Mollie I1, p. 6)

Another aspect of her teaching that Mollie was asked to reflect on during the interview related to technical glitches using technology. Mollie indicated that the unsuccessful moments that she had experiences with technology usually related to technical glitches such as the internet working:

Oh, plenty of lessons that you've got planned and you're trying to use technology and the internet doesn't work or the connection fails or it was working five minutes before and then it crashes or plenty of things like that. You forget how to do different things to upload things and the children are supposed to be doing it for the next lesson or for some reason things don't work. We were trying to use the video camera and it wouldn't work on Macs. Oh there's been plenty. There's one almost every day...
(Mollie I1, p. 8)

Mollie did not regard these issues as a reflection on her pedagogy: "it's not really the lesson, it's not anything that you've done, and it's not what the children have done. Yes it's generally technical" (Mollie I1, p. 8) however she expressed a keen interest in pursuing professional development (PD) that placed a personalised learning perspective on using technology in the classroom:

Lots of PD in this area, how to use it properly yes, I'm really open to it. Pete and I tried to go to a PD yesterday on how to personalise learning because we really want to do it in the IT [information technology] area but it was a bit of a flop. But we're really looking because there are not many people, we don't think, that are doing it well. So we are trying to find some guidance. I'd love to find some good PD. (Mollie I1, p. 7)

In response to the question, 'How would you describe you competence with technology?' Mollie noted that the challenges associated with learning to use Macintosh computers had slightly dented her competence:

I've had to learn a lot this year but I would have considered myself better last year but now I don't really know. Coming here I didn't really know as much as I thought I did. So there is a lot more to know than I thought I had known. So I'd put myself in the middle somewhere because there's so much to know and I would have thought I was pretty competent but then coming here there was so much that I didn't know and that I've learnt this year and I still don't know. (Mollie I1, p. 5)

For Mollie, learning how to use the Macintosh computers required her to re-learn many shortcuts and skills however she acknowledged that the experience had positive benefits:

And trying to apply the knowledge that you did know, all the little skills, all the little shortcuts, and that that you used, trying to apply them to Macs and then trying to show the children too, and learning from the children and that's been a good thing too. But yes probably middle of the range somewhere. (Mollie I1, p. 6)

Regardless of the technological challenges, associated with learning how to use Macintosh computers, that Mollie was experiencing at the time of the interview she believed that she was "good at computers" (Mollie I1, p. 6) and eager to go beyond the skills and shortcuts to explore the potential of the Macintosh technology in the classroom:

I thought I was competent with technology but it was just really that I knew shortcuts on the computer and I knew how to do things on the computer that was it. But there is so much more that you can do than just these on a computer and that was my really

was my idea of technology before I came here. So I guess ask me in 12 months but yes, I'm good at computers. Yes, but there is just so much more that you can do. (Mollie I1, p. 6)

Mollie indicated that moving forward using technology in her classroom and across the school would be closely related to the developing competence of those involved in the program; teachers and children, as they continue to learn from and with one another:

...the more we use it [technology] and the more we become competent and the children become competent I am sure that they'll suggest ways that we can be [using technology]. They love it, so I am sure that they'll suggest ways that we can be doing it [integrating technology]. When other people you know, when you look at what other people have done we'll get something. We will get there. (Mollie I1, p. 9)

5.4 The Cycles

Preparation for the First Action-reflection Cycle

After the initial interview Mollie and the researcher met to discuss planning for the first action-reflection cycle. This first action-reflection cycle was to commence at the beginning of term 3 and to last for the duration of the term. The second and final action-reflection cycle was to occur during the final term of the school year. During this planning meeting the action - reflection model (Chapter 3, Figure 3.2) was presented and Mollie was introduced to learning story journals (LSJ) as a data collection tool for the study. The meeting concluded with Mollie sharing her ideas for exploring how to further apply technology to the literacy context in her Preparatory classroom. At this meeting Mollie indicated that the whole school inquiry focus for the term was about becoming a sustainable school and that the learning experiences that children would be engaged in throughout the term would be integrated into her planning for the application of technology to the literacy context (Researcher Journal).

5.4.1 Cycle One: Becoming a Sustainable School

Learning Episode 1: Showing an Interest in the Community

According to notes taken in the researcher journal Mollie needed time to come up with the technology focus of her first cycle. Mollie and Pete were experiencing some issues with the technology they were using and this seemed to be a blocker in moving forward (Researcher Journal). They needed technical support and as there were very few schools in the region using Macintosh computers their current support was coming from interstate and was not readily accessible and available (Researcher Journal). Mollie noted in her initial interview that her observations of the way in which her earlier implementation of podcasting in the classroom had indicated benefits in children's language learning and Mollie expressed a desire to continue to explore the potential of podcasting to enhance literacy learning: "Mollie is convinced that oral language underpins all literacy learning and believes it would be a natural progression on what she has been doing in the classroom to extend on podcasting for the first cycle of the research" (Researcher Journal). Mollie was eager to discover if podcasting could be used in a way that encouraged writing development in the Preparatory classroom.

The researcher introduced Mollie to digital language experience as a possible source of inspiration for encouraging writing in the classroom and Mollie showed some interest in this strategy but did not commit to this direction (Researcher Journal). Instead, Mollie eventually decided to continue exploiting podcasting software in an effort to improve writing outcomes for the children in her class. Notes taken by the researcher indicated: “Mollie suggested that children might record their ideas, then use podcasting to assist with the writing process” (Researcher Journal). Mollie’s rationale for this direction was summarised in researcher notes taken at the time of the discussion:

Mollie felt that children were not taking off with writing as well as they have with reading and thought that using a recorded version of their ideas may assist them to compose.” (Researcher Journal)

In her LSJ Mollie described the way in which excursions to local destinations were incorporated into the program to foster the children’s interest in the inquiry focus: “To get the students to take an interest, they visited the Barrum Water Treatment Plant and Kings Reservoir, as well as Smith’s Hill, to observe their waste management procedures” (Mollie LSJ1, p.3). Mollie noted that at each excursion the children were put into groups with an adult leader and each group was provided with a digital camera. The children were encouraged to take their own photographs to help them remember the significant and important information about the excursion:

On each of these excursions, students were put into groups with a group leader that was responsible for a camera. In their groups, every student was able to take photos of things that tell the story of water. (Mollie LSJ1, p. 3)

...the children were put into groups and they took photos of everything that was happening. So instead of Pete and I taking the photos the children were in charge of the camera. (Mollie C4, p. 1)

Through some preparation activities back at school Mollie ensured that the children knew what sort of information they were seeking to guide their inquiry and photography. The preparation activities involved the children making some predictions that could be checked during the excursions:

The students knew that they were required to gain some understanding of the story of water, as well as what happens to our waste. They predicted what they thought happened to both waste and water to help us assess their understandings. (Mollie LS1, p. 3)

...so they were predicting what they thought happened to the water before we went there and then we looked at that again afterwards (Mollie C4, p. 1)

During the excursion Mollie was particularly pleased with the way that the children used the photographs they had taken to share their learning:

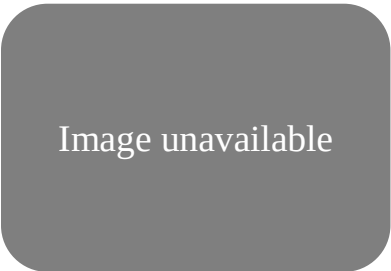
...being involved using the photos they’d taken they all came and spoke to me. I was there to start it and then they did it by themselves. I was just there for extra prompting for the information. They told me about what happens to the water so they went from some of them thinking that it just disappeared to actually knowing where it went so they told me what happened and to realise that it was a cycle. (Mollie C4, p. 1)

When they returned to school Mollie wanted the children to integrate the photographs they had taken on the excursions to create a podcast about their learning. Mollie’s expectations were that the children would then use their individual podcast recordings to help with writing about the water cycle. Figure 5.2 shows an excerpt from Mollie’s LSJ noting the way that the children used their podcasts on the I-Touches to assist them to write the ‘story of water’.

From the journal entry it is evident that Mollie wanted the children to “listen to it [podcast] and then try and write down what they had said” (Mollie C4, p. 1). However, Mollie’s reflections on this task show that this was not the case for all children. Mollie wanted all children to have a finished podcast with photos but the task was too difficult for some children. Mollie brainstormed some options to support all children with the researcher and she decided to modify the activity so that all children could achieve success:

The most successful students that were able to listen to, and write what they had said were the middle and high-achievers. To help the low-achievers have success, they dictated the sentence, and it was scribed for them. (Susie LSJ1, p. 8)

FIGURE 5.2
Excerpt from Mollie’s LSJ1, pp. 4-5

Commentary of Critical Incidents	Artefact
Using the photos that they had taken, the students told the story of water from their perspective. This was recorded into Garage Band. They then listened to this recording on the I-Touch to help them write down what they had said for me to type (4).	 (4) Ashley using the I-Touch to listen to what she has recorded about the story, of the water and getting it written down.

In an effort to ensure that all children completed the activity with some success Mollie opted to scribe the sentences for these children and by her own admittance, maintain a writing focus that was more manageable for the children than writing complete sentences: “I ended up getting them to dictate the sentence to me. At least then they still did the listing but I did a lot of the writing for them, just scribing” (Mollie C4, p. 2).

Although many of the children found this learning experience challenging Mollie was eager to further explore the application of technology to the literacy context. Mollie was particularly interested in using the software on the Macintosh notebook computers in a way that fostered children’s writing development and she continued to plan learning experiences with this goal in mind.

Learning Episode 2: E-books on the Water Cycle

The technology focus in the writing context was further encouraged after Mollie had an opportunity to become more competent with using the computer software herself. I-Movie was a program on the Macintosh computers that could be used to make e-books. After exploring the I-Movie program one afternoon, Mollie was extremely animated about the possibility of the children using the photographs they had taken to create their own e-books in this program:

After working on I-Movie one afternoon and producing a simple 'Story of Water', I was really excited about the possibilities of it for e-books. It allows you to put pictures, text and your voice together quite easily. I was so excited that it became my shared reading one morning with the Prep students. (Mollie LSJ1, p. 5)

Mollie hoped that the Preparatory children would be able to use I-Movie to create individual e-books which told the story of the water cycle in the children's own words. This involved the children using a new program to insert pictures then add text and voiceover to create an individual e-book. Unfortunately, this activity did not meet with the success that Mollie anticipated. However she reflected deeply on this experience for both herself and the children:

Trying to get the Preps to produce an e-Book in I-Movie was a nightmare by themselves because it was new. There was too much just to do at once. They were really familiar with Garage Band but because I-Movie was new there was just too many skills that needed teaching so they had to drag in photos and make text and record their voice and making sure it all lined up...all skills I'd taken for granted, and I realised after spending 45 minutes just doing one child that it was not their work... they were doing bits and pieces, it was just going to take me so much time and it wasn't their work. (Mollie C4, p. 2)

Being a program new to them, it was too much information to introduce at once. There were too many skills that needed teaching. They had to drag in photos, make text and record their voice, making sure it all lined up; all skills I had taken for granted... I realised this after one hectic morning, and then spending 45 minutes just to fix up Ned's! (Mollie LSJ2, p. 8)

During an observational visit from the researcher Mollie took the opportunity to reflect on the issues that had arisen from the children's participation in this activity and contemplate support strategies to enable children's success. From the emerging discussion Mollie recognised a need to modify the activity for some of the children or to add further scaffolding to the task to enable all children to be supported in the process (Researcher Journal). The scaffolding to this task was initially implemented in three layers:

Those that are capable write it [water cycle story] using podcast (oral) to guide them. Other children use speech bubbles and have text dictated for each speech bubble. Children then use text from speech bubble in the e-book. Other children have text scribed for them as per Language Experience. (Researcher Journal)

Even with modifications the task still proved to be too difficult for some children. For Mollie, the creation of books that depicted each child's understanding of the water cycle remained an important

learning outcome, so Mollie opted for the children to complete a printed version rather than digital version of the book:

The alternative to this was to print off a number of the photos they had taken to match how they saw the story of water. I [Mollie] typed up their text, and they had to match and sequence the picture with their text. (Mollie LSJ1, p. 8)

Although this learning episode did not proceed in the way that Mollie intended, her observations of, and reflections on the children's experiences provided insight which she used to guide planning for all future learning experiences using technology.

Mollie reflected on the insights gained from the first two learning experiences in a mid cycle interview with the researcher. In this interview Mollie's reflections on the way that the children responded to creating their own e-books indicated that she felt that there was value in the experience despite the difficulties that emerged:

...when we figured out how to use 'I-Movie'. That was one of the most exciting things and when we made that first book together, that was really exciting and then being able to try and develop that with the children. Their excitement when they watched it as well and think that they could do that. (Mollie C2, p. 1)

For Mollie, it was a matter of modifying the activity to ensure that all children could experience success: "It's just now trying to modify, so that they do get that experience properly" (Mollie C2, p. 1). Discussion with Mollie during researcher visits indicates that she noted the importance of scaffolding the experience for children: "Mollie noted that there was too much choice for e-books; too many photos to choose from and a need to scaffold the learning experience further and provide a more supportive framework for learning" (Researcher Journal). Mollie also reflected on her expectations of the children and realised that she was expecting too much of them:

...the expectations that I placed on the children. So I sort of assumed that they could do too much. I expected that they could drag the photos; there were too many skills that had to do. They had to sequence it; photos there were too many photos to choose from. There was just so much information the children had to try and narrow it down themselves, without enough support, so I ended up doing a lot of the work and so we had to modify the activity then to make it more manageable for the children. (Mollie C2, p. 1)

Mollie felt that the change from creating a *water cycle e-book* to a *water cycle book* was well received by the children. She described the children's enthusiasm for the activity in the LSJ and during an interview at the end of the cycle:

The students created their own book that told their understanding of the story of water. They used Photo Booth to take a photo of themselves and print it off for the front cover to put the title on (10). This made them really excited to be able to have a book that had created themselves, both the photos and the matching text. Most students wanted to take it home that night, and didn't want to have to wait until their learning journal came home. (Mollie LSJ1, p. 11)

...it made them really excited to be able to have a book that they had created by themselves... by doing it that way they had done it all themselves other than the typing of the text. They'd made up the text and they knew that what was typed was their words and I hadn't done any of that which is good. Some of them were so excited that they wanted to take it home. They didn't want to have to wait until their learning journal came home later on. (Mollie C4, p. 3)

By modifying the task so that the technological components of the activity were not as complex Mollie believed that the task was more manageable and provided more ownership of learning for the children:

...they had more ownership over it, more than me inserting the text into I-Movie. They actually just cut up the text and sequenced it. So I limited the amount of skills they had to use and the amount of options they had to go and be distracted by, to try to focus their learning. (Mollie C2, p. 1)

Mollie recorded in the LSJ her observations of the children's enthusiasm for this task in its modified form. The excerpt in Figure 5.3 shows Mollie's recorded observations of the children's participation in the learning process.

FIGURE 5.3

Excerpt from Mollies LSJ 1, p. 14

Commentary of Critical Incidents	Artefact
They loved being able to produce pieces of work on their own, e.g. using photos they have taken to tell a story (13).	(13) This is a photo of matched pictures and text. The students took their own photo, and all photos in their story were taken by the students.

In the mid cycle review interview Mollie indicated that the insights gained from the experience of creating e-books/Photo Books with the children challenged her to look more closely at her pedagogical approach to using technology in the classroom:

...it made me realise how I was going to do things differently. It wasn't the program. It wasn't anything. It was the way I was going about it. So, like I said, too many options, too many photos to choose from, too much stimulation for them and they just couldn't focus on it all and I can't blame them. They hadn't had any exposure to it before and then I was expecting too much from them. So next time to make it a simpler task and not so complex where they can, actually the children can still extend themselves if they want to, but they've got the support if their level is really low and they still need lots of constant support. (Mollie C2, p. 1)

For Mollie, it was important to provide learning experiences for the children that were authentic, personalised and provided enough scope for all children to achieve success:

Mollie articulated a desire to keep coming back to providing an authentic learning experience and personalised learning. She recognised a need for open ended tasks that are structured but open ended enough to provide extension for those needing further challenge. (Researcher Journal)

Mollie also noted in her reflections that she realised that children need time to learn technological skills associated with new software and that she needed to make ensure this occurred. In response to the question, *‘What was the key learning for you during this cycle?’* Mollie stated:

Probably how good I-Movie can be but to take it slower and not expect it all to happen straight away. To skill the children up to be able to do it and give them something that they can do that’s not way above their heads and too challenging. Looking for other ways to be able to use it [I-Movie] effectively. (Mollie C2, p. 3)

This growth in her understanding was described alongside her developing understanding of personalised learning. In relation to the further exploration of child developed e-books in the classroom Mollie noted that a personalised learning approach would ensure that “they’ve [children] got different options about where they can go” (Mollie C2, p. 2). For Mollie, this activity had challenged her to acknowledge the range of abilities of the children in the classroom and the importance of catering for these:

...we’ve got a few children that are independent enough to be able to work on their own like that too. So even just with what we were doing with them, listening to their voices and writing that, there were a handful of children that could manage that, but then there was some children who found it hard to remember the sentence and get it down because it was so challenging for them to be able to write and listen for the sounds and it was just too much. (Mollie C2, p. 2)

When asked to reflect on student engagement during this activity Mollie again referred to the diverse range of abilities in the classroom as influencing engagement and student engagement outcomes not being as effective as she would have liked:

Depends on what level they’re at and that’s what I’ve found the worst part was. The children that were low weren’t as much and they were the group that I was really trying to target but it was the one, the children that were good readers and good writers and good listeners that really were able to achieve and that was not what I was aiming to do. So, yes, I didn’t feel the lower children were really able to be as engaged as they could be. They were at the start but quickly grew tired of having to seek assistance to be able to get their work done, to be able to do it and they didn’t have the satisfaction from the computers that they should have been able to have. They were but it was just not as much as I would have liked. (Mollie C2, p. 3)

Mid Cycle Reflections

Mollie used the insights gained from her reflections on the first part of the cycle to guide her planning for the remainder of the term. When asked to consider where she hoped the children would go in their learning for the remainder of the semester Mollie described a focus that was driven by her current reflections:

A lot of peer interaction. I want them to learn from each other too. I think because so many things that I've done with them have been individual it doesn't give them much chance for interaction to learn from others. (Mollie C2, p. 2)

This move towards working in groups had a strong emphasis on the children gaining a stronger sense of achievement through working with others. Mollie described her aspirations for the children's learning in creating group narratives; an activity she had already introduced in the classroom, in terms of a sense of achievement for all:

So a sense of achievement to think they can do things, even just being able to work together problem solving. Lots of those sorts of things and listening to themselves and hopefully responding to feed back as well, depending on how we go with the stories. (Mollie C2, p. 2)

With the aim of increasing the children's group work and interactions using technology Mollie set about planning for the remainder of the first action-reflection cycle. In keeping with the whole school sustainability inquiry theme, Mollie set about planning for learning in a way that she hoped would extend children's knowledge of the inquiry topic and also foster writing development.

Learning Episode 3: Narrative Text Type School Based Podcasts and Prep Newsletters

Through extended discussions with the researcher, throughout the previous learning episode, one area of her practice with technology in the literacy context where Mollie felt change may lead to improved learning was in relation to the opportunities children had to use it with others (Researcher Journal). Mollie could see that there were possible benefits in the children working in groups with technology in the literacy context. She had observed when the children were working on e-books that "the students were starting to show an interest in story writing and using their imagination to compose a story" (Mollie LSJ1, p. 3) and she wanted to provide a collaborative technology and writing context.

In her LSJ Mollie described the planning process the groups of children went through to plan a narrative that incorporated key aspects of their learning through the inquiry. An excerpt from Mollie's LSJ in Figure 5.4 shows the significance Mollie placed on including key concepts from the inquiry stimulated by clip art pictures and the use of a planning template to support the group in developing a simple narrative with beginning, middle and end. This explanation was reiterated in her interview at the end of the cycle where Mollie provided an example to show the way in which the children used the planning template to plan their narratives:

...they were given some little pictures just to help give them some idea rather than having to think of a story form think of the story from scratch and some of the characters were to do with sustainability so there might be a picture of a person planting a tree or watering plants. I was just throwing that in there to have some sort of something in there, link it somehow. And so the children had the characters, they chose some characters and put them in the right sections and they had a whiteboard marker to write ideas or things that might be happening in each one. So that was their planning. (Mollie C4, p. 2)

FIGURE 5.4

Excerpt from Mollie's LSJ1 showing Entry for Group Narratives, pp.5-6

Commentary of Critical Incidents	Artefact
To support the interest in narratives, the students were given a board divided into 3 parts (5). The first section (green) was for the beginning, the middle section (orange) for the problem, and the last section (red) for the resolution/end. Each group was given some clipart characters to help spark some thoughts. Some of the characters were to do with sustainability. E.g. planting trees, watering plants and throwing out rubbish. The characters were placed on the appropriate section and ideas were recorded beside them to help shape their story. They really enjoyed having this control over where their story went, but needed the support of the pictures and 3-part planner.	(5) The planning sheets helped the students come up with some interesting narratives.

Once the groups had finished planning and together had written a group sustainability story the final narratives were to be published as a podcast. Observation notes taken by the researcher indicated that “the children are working in groups of three, and some groups of two, to create group narrative podcasts” (Researcher Journal).

The process of working in groups to create narrative school based podcasts presented some new issues in the classroom. Group work had previously not been a major learning focus in the Preparatory classroom and some children experienced difficulty working together in small groups. In her LSJ Mollie provided an example of the way in which the social skills of some children impeded the progress of their group narrative school based podcasts. The excerpt from Mollie's LSJ in Figure 5.5 describes the interaction between two children working on the written draft of a group narrative. Mollie noted in particular the way in which Jessie chose to resolve the conflict with a minimum of disruption to her learning. In the interview later in the next cycle Mollie reflected back on this episode again:

One of the problems that they faced with doing the narrative was working together because we hadn't placed a big emphasis on working together so some of them didn't cope too well with working together. And in some of the groups there was a big problem for a bit of a power struggle. And I've just said about Jessie who is normally fairly quiet and she was with two of the dominating boys and then that day with John when she was correcting what John was writing and he wouldn't change it, and so then she waited for her turn and thought, 'I know, I'm going to change this and fix that up.' (Mollie C4, p. 2)

FIGURE 5.5

Excerpt from Mollie's LSJ 1, pp. 7-8.

Commentary of Critical Incidents	Artefact
Working together. The students hadn't really been skilled at working together, and for some groups it became a bit of a problem and a power struggle. It was interesting to observe John and Jessie working together and learning to compromise. Jessie a normally quiet girl was in a group with two naturally dominating boys, one of which is quite intelligent and confident in his abilities. We watched her first of all verbally correct a sentence that didn't make sense as he was writing it. Then after he didn't listen to her, she proceeded to fix it up herself when it was her turn to write (8)	(8) Jessie - trying to fix up the mistakes John had made to their narrative without him catching her!

As the cycle progressed Mollie identified benefits associated with the children working in groups on the podcast narratives. In an interview at the end of the cycle Mollie stated:

When the students were publishing their narrative, rather than doing or producing a good copy, they just recorded it orally into Garage Band and when listening to their podcast it helped groups of students to realise that some sentences didn't make sense, and Meg and Laura when they were recording it one time they were recording it loudly "T H I S I S T H E S T O R Y O F..." together and then instead of just coming and interrupting them and getting them to fix it up they listened to themselves and thought, 'Oh this sounds bad so we better do it again, and do it one at a time, and do sections each to make it more exciting and we need more expression rather than just yelling'. (Mollie C4, p. 3)

This reflection is in reference to documentation in Mollie's LSJ that is captured in the excerpt in Figure 5.6. In the excerpt Mollie describes the way the two children learn about fluency and expression in reading through their experience of podcasting their narrative together. These observations are supported in notes taken by the researcher on an observational visit where it was noted "When children listened to each other's narratives they provided feedback on what they heard. Students gave valuable feedback to each other on what sounded 'bumpy' and what sounded 'smooth' in their voice recordings" (Researcher Journal). Photographs taken on the day of the observational visit are displayed in Figure 5.7. Photographs show the children working together in their groups to podcast their narratives, and sharing their recordings with the whole class to gain constructive feedback on the recording.

FIGURE 5.6

Excerpt from Mollie's LSJ describing Group Narrative School Based Podcasts, pp. 10-11.

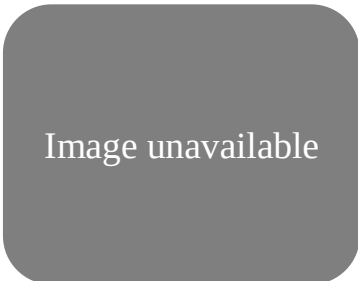
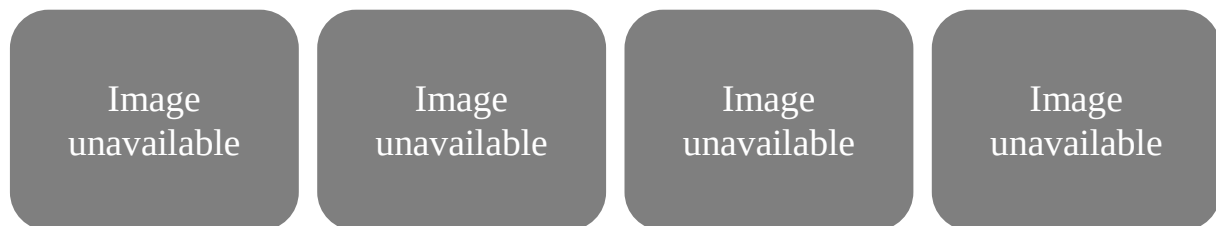
Commentary of Critical Incidents	Artefact
To publish their narrative, the students recorded it orally in Garage Band. When listening to their podcast, it helped a group of students realise that some sentences didn't make sense. When Lara and Meg initially recorded their narrative it was together, with really loud voices. Then when listening to it, they decided it would sound better if they just read a part each, one at a time because you don't normally read a story with two people really loud; it needs expression to sound interesting (11).	 (11) Lara and Meg on the computer, yelling their story when they were recording it. <i>A story always sounds really good when it is yelled.</i>

FIGURE 5.7

Children Recording Narrative School Based Podcasts



During a follow up visit to Mollie's classroom the researcher noted in a journal entry that Mollie was beginning to articulate benefits for literacy learning that stemmed from the infusion of technology into her literacy program: "Mollie noted that since doing e-books and podcast narratives the children are writing more and they are saying that they can write more now" (Researcher Journal). Mollie seemed to be building on this knowledge in her program. On the day of the researcher visit the children were using a template in the PAGES program to create a Prep newsletter to be sent to families through email (Researcher Journal). PAGES is a word processing program similar to PUBLISHER in Microsoft Office. Photographs in Figure 5.8 show children working on the newsletter using Macintosh notebooks on the day of the researcher visit. It can be noted that although each child created their own newsletter the children can be seen to be busy supporting each other in their learning. Mollie's documentation outlined in Figure 5.9 shows that the activity presented further challenges for children in relation to keyboarding skills and resulted in the activity becoming time consuming.

FIGURE 5.8

Children in Mollie’s Classroom working on Individual Sustainability Newsletters using PAGES Template

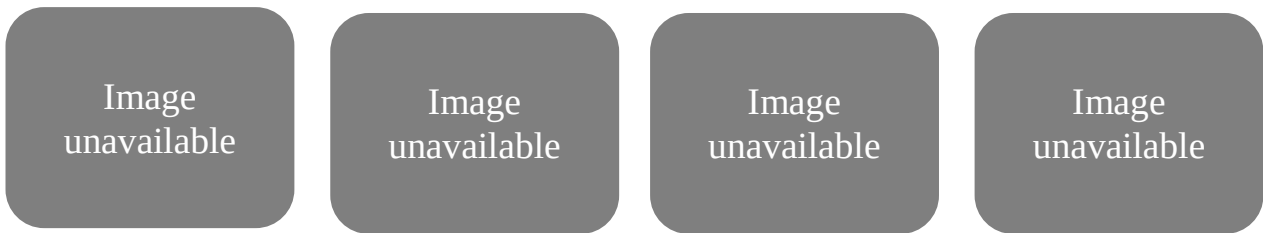


FIGURE 5.9

Excerpt from Mollie’s LSJ1 in Reference to Prep Newsletter, pp. 7-8.

Commentary of Critical Incidents	Artefact
One thing we found when publishing our newsletters on the computer (9) was that it was very time consuming because the students were very unfamiliar with the keyboard. To combat this, we had to use 3 adults to assist in the typing process, in conjunction with the students.	(9) This is a sample of one of the newsletters the students produced about being sustainable. It was hard to get all the ideas typed into the newsletter, even with this large-sized text.

Mollie found that she needed to modify the activity so that all children could finish it before the end of term. In an interview at the end of the cycle Mollie reflected:

...one thing that we found when the children were working on the newsletter, when they were typing it up onto a computer; it was just because they didn’t know where the letters were, they didn’t know what happens with the keys and that all sort of stuff. It was very time consuming. But to combat that I said that we had to use three adults to help to type. (Mollie C4, p. 3)

Mollie indicated that this support was given to those children who needed it while others were able to cope on their own: “We had to use three adults to assist in the typing process, in conjunction with the students” (Mollie LSJ1, p. 8).

In the remaining weeks of the term Mollie continued to plan learning experiences where technology was used to foster writing development. Using a process approach to learning with technology Mollie embraced the use of technology during the writing process rather than as the end

product. In keeping with the sustainability inquiry theme the final learning episode for the term involved children in using the waste they had collected to create sculptures that became known as '*Junk art*'.

Learning Episode 4: Junk Art

The '*Junk art*' activity involved the children in keeping an audit of rubbish used over the course of a week. The children then used the recyclable waste they had collected to create a junk art sculpture. With a view that the children might like to copy each other's creations Mollie set the children the challenge of writing a procedure for the creation of their '*junk art*' pieces. Mollie's LSJ entries outlining this procedure are recorded in the extract in Figure 5.10. From her conversations with the researcher about scaffolding children's literacy learning Mollie was considering ways to support children in their learning. She provided the children with a template for the writing of the procedure text. The children then used the digital camera to photograph their finished sculpture and glued the photograph to the completed procedure template as shown in the artefact column in Figure 5.10:

Children took their own photographs of their creations. They wrote instructions for others to follow for making the junk creation. The instructions were put together with the photos. Mollie provided a template for the children to write their instructions for making a junk creation. Children recorded these instructions and will type these up using pictures of art work to show finished product. (Researcher Journal)

5.4.2 Mollie's Reflections on the First Action-Reflection Cycle

In a mid-cycle interview, end of term interview and end of cycle interview (after the LSJ was completed), Mollie took the opportunity to reflect on her learning and the learning of the children throughout the term. In her LSJ Mollie described the way in which the children's competence and confidence with using technology had improved throughout the term:

Over the course of the term, the students became more confident with the I-Touches and use of computers... There were also low achieving students interested in computers that struggled to complete the writing process individually, but became leaders in podcasting and using cameras and I-Touches. (Mollie LSJ1, p. 14)

Of particular interest to Mollie was the way in which the children's developing competence with technology seemed to foster independence and, for some children an opportunity for leadership that they may have otherwise not experienced:

So over the course of the term I saw that they became more confident with the I-Touch and the use of computers. They loved being able to work independently and produce things on their own and even the low achieving students that were interested in computers they were able then to have some sort of leadership as well, because generally our low achievers are pretty switched on with the computers, so they were able to become a leader if there was some sort of technology involved. (Mollie C4, p. 3)

FIGURE 5.10

Excerpts from Mollie's LSJ1 describing the 'Junk Art' Activity

Commentary of Critical Incidents	Artefact
To assist the students in understanding about becoming sustainable and reusing their rubbish, the students collected and audited their waste over a week (6) and made some junk art from it, using only the waste (7). To help the students understand about waste, they recounted how they created their junk art, using the procedure genre, taking a photo and printing it out (8).	 (6) The recycling audit that the students put in a clipboard and took home, recording their waste for a week.
	 (7) An example of the junk art that the students took a photo of and wrote a procedure about.
	 (8) The students took and printed the photo to accompany their procedure text.

A similar observation was made by the researcher:

Mollie noted that the children are learning from each other when technology is used in this way and that there is a group of skilled student leaders developing that can assist others and they believe that there is now a real opportunity for deep learning to occur. (Researcher Journal)

Mollie articulated her belief that when used appropriately technology provides opportunities for children to show leadership. She believes that these children feel valued and enjoy sharing these skills with others. (Researcher Journal)

In her LSJ Mollie described the children's independence in terms of the being able to work for an extended period of time without consistently having to seek help from the teacher. Figure 5.11 shows an excerpt from Mollie's LSJ where she noted the children's ability to work independently for extended periods of time. When Mollie reflected on the children's ability to work in the literacy block for extended periods of time she believed it was linked to the children's competence with using the notebooks computers and the software:

They have moved away from me being the bearer of all knowledge and they're much more independent and so they can use the I-Touches to support their learning task and they can work on a single task like, their concentration is much better and they can work on a task for the entire two hour literacy block. And their skills that they are

using are much more than you would expect for a normal Preps anyway. Even just be able to save to folders and open things up by themselves and trying to just problem solve. We're still working on it but they're becoming better at moving their initial response from being to going to ask the teacher to actually having a go themselves and they know that if they haven't had a go themselves we're not going to come and help them as well. (Mollie C4, p. 3)

In Figure 5.11 Mollie documented 'Holly' seeking help from her peers when she needed assistance with the new program she was using. In her final reflections on the cycle Mollie commented on another episode where the children supported each other in their learning with technology and noted that this kind of interaction between children was commonplace in the classroom:

...you'll show them tricks and whatever else but they learn so much more from each other, and the thing is that John showed me that but Brian had showed him. So he hadn't learnt himself but it was something that he learnt from someone else but it wasn't me, which is good. (Mollie C4, p. 15)

In her final reflections on the interactions of the children supporting learning Mollie stated:

...they do support each other. They don't ask us [teachers] the technical questions unless it is something that they're really struggling with. They'll ask us '*How is this sounding?*' if they're editing, or '*What can I add to this, I'm really struggling with this part here?*' but it isn't '*How do I do this with my podcast?*' or '*How do I put my voice on*' or whatever else. (Mollie C4, p. 15)

Researcher journal notes supported this observation and noted that children's questions to Mollie moved from a *technical* to a *learning* focus:

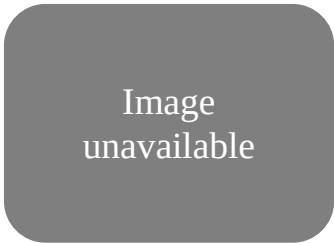
Questions asked by children have changed. Initially they were ICT skill based questions but as confidence increased and Mollie continued to hold strong in her philosophy of personalised learning these questions moved more towards the literacy and the learning. As children have become more independent in their learning (personalised learning philosophy) they support each other with the ICT allowing Mollie to focus on children's needs in relation to literacy and other KLA's. (Researcher Journal)

Mollie emphasised that the interactions between the children when they used technology seemed to be part of the learning that happened in the classroom. She acknowledged that at times the children's conversations did raise some conflict but she felt that they still needed to learn from these experiences:

...one of the '*aha*' moments from last term was how well they worked together in a group for doing something like that [podcasting] and how much quicker it was, because if one doesn't remember how to do something the other does. Although sometimes it can cause trouble; '*you should have done this*' or '*you didn't click on that*' or whatever else. It helps I guess to sound better and having different opinions; '*No you shouldn't be saying it like that*' or '*We need to do this*' or '*We need to do that*'; Different ideas rather than just you always doing things for yourself. We say to the children we don't always just do everything ourselves. We often go and ask other people for an opinion, so it's good to have somebody else there to be able to create the same piece of work and have the different opinions, even if you don't agree with them sometimes. (Mollie C4, p. 10)

FIGURE 5.11

Excerpt from Mollie's LSJ1 documenting Children's Independence when using Technology

Commentary of Critical Incidents	Artefact
They have moved away from the teacher being the bearer of all knowledge, as they become increasingly more independent (14). They choose to listen to the I-Touches for support on their learning task, and can work on a single task for the entire 2- hour literacy block.	 (14) Jim on the computer - wanting to work independently and continuously shooing teachers away!
They can choose their time to podcast their monthly readings, and save it to their folder. They can independently open and save their work, as well as clicking and dragging and resizing photos (15). We are continuing to push this independence and the initial response if they are having trouble to be to problem-solve, and not ask the teacher to fix the problem immediately.	 (15) Holly is learning to use the program "Pages" on the laptops, and shows independence regularly when she asks her friends for help (e.g. how to save/change the font size) instead of the teacher.

Mollie noted in her LSJ that over the course of the term the way in which she used podcasting with the children had changed: "In terms of podcasting, we have gone from producing school based podcasts in small groups (for support) to producing them individually and asking their peers for support" (Mollie LSJ1, p. 14). This observation was also raised in her interview at the end of the cycle:

In terms of podcasting they've gone from producing podcasting in small groups, like we do it as a *'focus group'* to actually doing it on their own in groups and pairs. So their reading we used to do; I used to have it one day a week as the *'teacher group'* for whatever the month was, but now they're doing that by themselves. (Mollie C4, p. 3)

For the children, Mollie believed that their involvement in podcasting throughout the term had promoted decision making skills and learning:

...the first reaction is to sit close to other people that will be podcasting, and they'll have four children sitting here, and then they start to realise, 'Oh, hang on. It's too much noise here now, so I can move my computer outside and do some recording outside, to do my podcasting. So I don't have your voice, your voice and your voice which is good'. So they're starting to make the decisions about even just what a good podcast sounds like and things like that as well, which is good. (Mollie C4, p. 9)

Mollie's reflections on the first cycle confirmed her mid cycle thoughts that the development of children's technology skills was an important consideration:

...you can't have them working on something if they don't know what they're doing and they are not supported, like the I-Movie; that was far too much to learn at once. So if I was going to do that again I'd slowly skill them up with I-Movie before I'd expect them to do anything like that. (Mollie C4, p. 8)

She also believed it was important for the children to learn to do things themselves with technology instead of her intervening in the process in an effort to get learning tasks completed:

...to be able to work independently and make sure it's their work and not my work. Because a lot of the time when we do work on technology, particularly with the Preps, if they're typing it would all just be you [Mollie] typing. So making sure that they're even taking the photos of the things they're doing and they're doing a lot of it as well, and you might type say a sentence but then they're making sure they know what they're doing as well, and get them to explain what they're doing. I suppose letting them run with it and having the trust that they are going to do the right thing as well, and letting them make the mistakes rather than taking over too much with the technology. (Mollie C4, p. 8)

For Mollie, her observations of the children and her experiences led her to realise that the children needed time to in some way to explore the technology; to make mistakes using the technology and learn from the mistakes. Skills were important but her learning journey so far, suggested to Mollie that the children were learning about technology through their own explorations: "they get you to show them a bit and they'll go and they'll learn how to do so many other things" (Mollie C5, p. 15). Mollie had realised that the children were going to make mistakes as part of the learning process and that this indeed was a way in which skills with technology were developed:

Sean has lost so many things on the computer because he hasn't saved it the right way. He hasn't saved it to the right place. He hasn't. He's somehow deleted it. Normally you try and back up so you've got it there. But oh well, too bad, you'll have to start again, because he's lost it and that's something that he's had to do, and you just think this is so much more time consuming. But now he's really careful with where he saves it and not blaming anyone else; 'I gave this to you and you put this here,' ... And letting them delete accidentally. You know they'll delete different bits and pieces in their podcast and my first reaction was always just to *undo* all the time, but now I'm like, 'No, too bad.' They've deleted it they got to try to record that again too if they don't know how to *undo* or whatever else. So letting them [children] learn from their mistakes. (Mollie C4, p. 8)

The skills that the children developed through this learning process had benefits later in the program because Mollie was no longer wasting time teaching technical skills repeatedly:

...you've got to skill them [the children] up to be able to do it [use the software] later on. So you're actually saving yourself later on, because if you do it they're not really learning how to do different things. It's like every time you go up and the children will ask you how to save or whatever else and they've forgotten and you'll say, 'No, have a go. What can you do?' It's much easier to just go File - Save yourself, but there's no talking them through it so that they remember it and then getting them to actually do it so that they can learn more from that, rather than them saying again next

time 'How do I save again?' Otherwise they are just going to keep going because they haven't done it themselves. (Mollie C4, p. 9)

Mollie identified that there was a reciprocal gain for her in this process because the children learned new things and when the children learned new things with technology it encouraged her to learn more also:

...I think as the children develop you sort of want to keep implementing it more as well, because as they keep getting really keen to do things you want to learn new things to show them as well. So you sort want to keep going. (Mollie, C4, p. 7)

In her final reflections on the cycle Mollie acknowledged a change in the way she used technology in the literacy session. The cycle had challenged her to consider implementation more carefully so that appropriate support for learning was embedded in the program. In her end of cycle interview Mollie described this support in terms of expectations and explanations:

...the big oops one in here is making sure that they have enough support structures. If they've got enough if I'm expecting them to do something we need to have a explained it clearly in the first place and have an idea of exactly what it is myself and to give them some support if they don't know how to do it. So you can't have them working on something if they don't know what they're doing and they are not supported, like the I-Movie; that was far too much to learn at once. (Mollie C4, p. 8)

In order to ensure these support measures are in place Mollie realised that working with technology not only needs to be manageable for the children but for the teacher. This became evident to Mollie when reflecting on the e-book activity where she felt that working in groups would have been "more manageable" (Mollie C4, p. 3). Through opportunity to interrogate this learning episode with the researcher Mollie identified a need to implement this change in practice:

After several discussions about group work and solitary work on the computers Mollie expressed the realisation that using technology with groups of children working together is potentially more effective than children carrying out solitary tasks. (Researcher Journal)

Mollie also related manageability of the task to the organisation of the technology and the children. She used the example of the way the children worked on the 'sustainability' newsletter to illustrate her point:

The newsletter even though its challenging its worth doing, and it's just you making sure that you give yourself enough time or you've got enough help in classroom when you're trying to do it. It's more manageable now doing it as 'learning *on the go*' because you don't have all the children doing it as once. (Mollie C4, p. 14)

In her reflections on the cycle Mollie believed that student control over learning had contributed to the successful learning experiences with technology throughout the term:

...the different things because they had so much control over it [learning] too and they can work independently. I guess that's how they've really achieved success, a lot of them, the higher ones too, because it has helped extend them to do a little bit more too, because they want their things to look better...(Mollie C4, p. 6)

Mollie expressed support for an approach to technology in the classroom that extended across the curriculum in her final reflections on cycle one:

I think even in my maths, there are so many things that I incorporate it [technology] into now. Like at the start of the year it was, *'We're doing this podcast,'* and that's where we focused all our energy. But now it's like, *'Well if you don't know how to do it go and podcast it and see what it sounds like'.* You know it's just part of what you do. But at the start it was, *'this is our piece of work'* and that was the way it has been, the way that I had it with the grade 5/6s and whatever else. It was something that you worked on in the computer room, not so much *'this is what we are doing on the computers'* its part of *'this is our learning'*. (Mollie C4, p. 7)

She supported this view with examples from her learning journey that acknowledged the spontaneity of learning in the classroom:

I know a lot of people, and I was guilty of this myself, but a lot of people will do a plan for what they're going to teach the children for technology for the year, but you just can't. If we had have at the start of the year planned that we would've been doing little podcasts for the learning on the go we wouldn't have thought we would've had learning on the go because they're so independent using the technology themselves. We wouldn't have thought that we would be using the I-Touches to be able to give them the instructions and things like that. There are just so many things that you just can't plan for because a lot of it is spontaneous learning just going with what's happening. If this child's done something really well on the podcast or whatever else, it's good to be able to share that with the other children then, rather than just say *'No, sorry no time for it. That's what you're doing'*. Yes, it's all just part of what you're doing. (Mollie, C4, pp. 5-6)

In the final cycle that Mollie had already commenced at the time of the final interview Mollie described her intention to continue to use podcasting across the program. As the construction of the new school building was now in full operation there was much interest among the children of how the site would develop, Mollie was eager to continue to incorporate podcasting into the inquiry focus on the construction of the new building:

...they've been technology with 'hands on' things, like at the moment we're creating, one of things that we're hoping to create is when they have finished their site plan, because they've got a site plan of the school and when they finish deciding where the veggie garden and whatever else is going to go there they then create a 3D model of it in their pairs. They have been working with multi aged buddies and then to create that in their pairs so they have to work together and slowly break it down. So we will have 16 of those and then they form a pair to decide well, *'Your veggie garden is here why is it there?'* and you know *'We think it should be here because it needs some extra sunlight,'* *'that's too close to the building you're going to get too much shade'*, or whatever else, and then they'll form a site plan not a 3D papier-mâché because we'll be there forever. Then the fours form eights and then they'll make a model here and then slowly we'll be forming down to be just the one. So we know exactly where things are going to go across the road too. (Mollie C4, p. 10)

Pete's Involvement in the Study Increases

As noted at the beginning of these stories, a chronological order has been maintained in the relating of the episodes and development of the stories. Towards the end of term three Pete began to

work more closely with Mollie in a team teaching capacity and this change involved both groups of children working together:

Mollie and Pete are doing some teaching together in a team teaching capacity. When this occurs the children are working together also. Prior to this change in teaching organisation Pete was extremely interested in what Mollie was doing as a participant in the study and he contributed to discussions about the study and the program, but was not involved in the teaching. He was using technology in different ways with his children in the classroom and sharing these experiences in discussion but was not actively involved in the study. The team teaching arrangement has generated further discussion and planning and involvement in the whole process as a team. (Researcher Journal)

Given his interest in the study, and his impact on the development of Mollie's story, Pete became a peripheral, but integral, part of the story in Mollie's learning environment.

5.4.3 An Interview with Pete

Pete thus was interviewed, as a part of the data collection, as he began to work more closely with Mollie. In his initial interview Pete identified that second to his role in the establishment of a new school, his current area of interest was in the development of a personalised learning program which effectively caters for the diverse needs of all children regardless of age:

I suppose establishing a new school the key interest for me is the establishment of a personalised learning program for children and how we can more effectively do that. That's to me my really key motivation and I've said this thousands times but I really believe it. I can't think of too many places in the world where we so clearly define what people can and can't do according to age except in schools. I think this is a paradigm that is completely antiquated and it needs to be addressed and addressed properly (Pete I1, p. 1)

Pete believed that his beliefs about catering for diversity across the curriculum had implications for professional development through the need to ensure that any form of professional development supported these beliefs. Pete identified that mode in which support for professional learning may be best provided as being through a mentor or critical friend model:

Look I suppose, no honestly most of my energy and reading of late has gone in the area whether it be through school, visitation and with a mentor in Melbourne or whether it be just looking through the lens with the likes of D.A. or J.D. Just trying to get people of a similar ilk who are just prepared to say we will work with you and act as a critical friends and mentors. (PeteI1, p. 1)

This view extended to professional learning relating to technology where Pete acknowledged that the Macintosh platform they were using had presented them with some challenges in relation to gaining support for innovative practice rather than a package of skills or 'tricks' for working with technology:

...the capacity to have someone, until you came along, probably and a guy from Bendigo, GF, who can actually act as a critical friend and say, 'Have you thought about trying this?' 'How about we try this as a next step?' So to just give us one step at a time instead of having some people just walk with a box full of books and stuff and throw it at you and say, 'Oh I've got all these fantastic resources'. You don't want

a barrel full of stuff you just want someone to say have a look at this next idea, 'Would you like to try it?' and we'll give it a go for the a month and see how it goes. (Pete I1, p. 6)

When asked about how he believed children best learn Pete indicated that he believed student engagement was the biggest factor influencing student learning:

By being engaged. Disengagement of students is clearly the biggest contributor, in my mind, to them not learning and then what we do as teachers, and we consistently say, "What's wrong with that child? Why won't that child learn?" and I actually heard a principal colleague make that statement recently at a meeting and I actually found myself publicly challenging, and I had to be very tactful about it, but publicly challenging that because it was a meeting in front of all other teachers and the like, and I just said that perhaps we need to rephrase or reframe the question to ask 'What is it that we are not doing?' as opposed to, 'What's wrong with the child?'. (Pete I1, p. 2)

Pete's belief that teachers are the biggest influence on student learning was reiterated throughout the interview. He noted that returning to the classroom after years of administration he was experiencing first-hand the challenges associated with engaging children in learning:

Well, point number one is that what's become really evident to me for is the first time teaching full time in 14 years is how hard it [engaging all children] is. It's really hard work. (Pete I1, p. 2)

Pete was quick to acknowledge that these challenges did not waiver his conviction to a focus on pedagogy as the best way to improve children's learning:

But I keep coming back to it instead of asking, "What's wrong with that child Pete?" As much as it's the first thing we often do as teachers, ask yourself the question, "What's wrong with me? What's wrong with my teaching? How can I change to accommodate that child's needs?" (Pete I1, p. 2)

Without doubt the problem is the teacher not the learner. There is no question in my mind about that. I have talked ad nauseam about having a student based personalised learning program and what I was presenting, some of these children in particularly the new ones to the school, was miles of the mark for what was real for them. (Pete I1, p. 3)

Throughout the interview Pete expressed a commitment to ensuring that all learning experiences in which children are involved are meaningful and provide scope for children to develop independence and exhibit control over the learning process:

... I am most excited about is this the *Learning on the Go* type activity work that we've got going with the kids where literally we have, well with the group of children I'm working with, there are five podcasts that the children can have access to and thus there are five meaningful tasks and they're fully aware of their inquiry based tasks that they can engage in and move in and out of. (Pete, I1, p. 2)

...children are engaged in an inquiry that they're interested in, that they're having some degree of ownership in. (Pete I1, p. 3)

He noted that when children are genuinely engaged in learning they want to work and develop independence:

But in terms of seeing genuine engagement I've been wrapped with that and really it's been fantastic and I can see the children want to please, want to work toward saying I'm becoming more independent. It's become really evident to me just to put them up and have them there as a visual display just as a small group of words but then actually to have a detailed explanation on the I-Touch that the children can go back to. They don't need me they just go and pick up and an I-Touch have a listen, "Oh now I know what I have to do again, I'm right," and away they go. (Pete I1, p. 3)

Pete expressed a concern that for many teachers catering for diversity was something that was done outside of the literacy and numeracy block. Pete articulated a belief that child resilience and catering for different learning styles should be part of the whole program in which literacy and numeracy are interwoven throughout:

...we also need to be able to get serious about accepting that there are different learning styles that there are different whatever, whether there are 8 or 9 different learning styles, let's acknowledge them. That there are kids who are highly verbal; there are children who are environmental. Let's be real about that; let's acknowledge learning styles and genuinely deal with them, not give lip service to them. My honest belief is that very often the issue of learning styles kicks in after lunch; you know we've had the literacy block, we've had the numeracy block, we have a bit of RE [religious education] and then we think about the inquiry after lunch, so we become innovators and thinkers about learning and teaching practices after lunch. (Pete I1, p. 4)

When asked to describe his view of what it means to be literate Pete's response resonated with his views on integrating learning experiences. He described being literate as more than attaining a set of reading, writing, listening and speaking skills:

My interpretation of being literate is the capacity to engage in learning and is much broader than reading and writing and speaking and listening. You're literate if you can articulate a piece of the artwork your understandings of the whys and wherefores of a piece of artwork you've created. You're literate if you talk about the natural beauty of the natural world. You're literate if you can engage in a science experience that is really open ended and yet you're able to move into it, engage in it, reflect on it, learn from it. There's a whole raft of meanings that we don't really pay any heed to at all. So yes, my interpretation of literate is the capacity to engage in learning. (Pete I1, p. 4)

In fact Pete's view of being literate and his view of technology were closely linked to engagement as the source of learning:

I think the best answer to that question... comes from the old understandings of, that technology process of investigating, designing, producing and evaluating and if it means you do it through junk art that's technology. If it means that you're actually using an I-Touch to access literacy activity that's technology. It's using an implement to support and enhance learning. (Pete I1, p. 4)

Pete described his vision for technology as being the platform for the development of a student centred program (Pete I1). He also articulated an interest in exploring technology alongside the developmental curriculum as an enabler for learning:

I'd like to use the vehicle of technology to enhance what we do on developmental curriculum. So those two things in a parallel formation. (Pete I1, p. 5)

Deeply entwined in his view that technology is a key enabler of learning Pete expressed enthusiasm for the flexibility provided through the wireless technology as a vehicle for learning:

...it [wireless environment] is greatly supportive of that [learning]. Rather than having the learning happening where the technology is, the technology is where the learning is happening and that's been really good I've enjoyed that greatly and I feel that this had a big impact on the learning and teaching environment. I think we're using it creatively in the establishment of podcasts but we're just scratching the surface particularly on a new platform. (Pete I1, p. 5)

Pete believed that the wireless environment had in essence, opened doors to learning that he was eager to explore further.

Using technology as a platform for learning has implications for the role of the teacher. In his interview Pete was very clear about the parameters of this role:

I'm a learner and I'm learning alongside the children, not pretending that I'm necessarily a step ahead of them because I don't know that I'd ever do that, but happily acknowledging myself as a learner and happily learning. (Pete I1, p. 4)

He believed his enthusiasm for learning with technology was a key strength and as such wanted to pursue this further: "I want to get better at using technology to help learning in the classrooms" (Pete I1, p. 5).

Pete described an example of integrating technology and literacy as hugely successful:

I suppose the most significant was that we had invited parents to send photos in. The very first podcasting at least was an invitation to parents to send photos in of their children telling their stories to the point of time that we were at. It was the richest language experience thing I reckon I've done; where kids were actually articulating, 'This was me at the beach with Mum and Dad when we went on holidays to Queensland' and they were orally expressing that. We were sharing laughs, we were sharing stories, we were reminiscing about these terrific times, often times they were making them up. They've got hilarious stories about some of these things when the child was a baby and hearing some of their funny little comments. Yes, so to hear the children just telling these wonderful stories about their lives and then recording them and in doing so making comment about 'how my voice sounded' and 'I spoke to quickly'. Yes, so all those observations about their oral skills, it was fantastic. (Pete I1, p. 4)

The subsequent sharing of this experience with the school community and the overwhelming response Pete identified as contributing to his current focus and direction as he works to establish a learning culture in the new school:

I think that the initial podcasts early on in the year were a really exciting innovation too just to say by the end of the first month of the school year in a brand new school that these children had created their own podcast was making a pretty powerful statement that whilst it wasn't perfect we were going to work this through and we have continue to persevere with it. (Pete I1, p. 1)

In response to the final question in the interview about his understanding of the relationship between literacy and technology the literacy and technology connections driving his leadership focus were reiterated:

Intimately woven [literacy and technology]. It can't be, if you following the line of thinking of my definition of literacy, you can't by sheer convenience, because of a lack of teacher expertise or willingness or desire or capacity just say, 'I'm going to ignore one whole dimension of our lives,' and technology, like it or not, is a huge dimension to our life. So we have to make sure, I think we have an absolute obligation to make sure, that technology is right there as a part of the learning environment on a daily basis. If it's not were missing the point. (Pete I1, p. 7)

As term 3 finished and term 4 commenced Pete continued to work closely with Mollie in the planning and delivery of the whole school program. The extent of Pete's influence on Mollie's application of technology to the literacy context became evident early in term four when the researcher brought a group of pre-service teachers to the school to learn about the school program. This visit is described in the following section.

5.4.4 Cycle Two: Podcasting for Learning

Learning Episode 5: Articulating Shared Understandings

Early in the final term the researcher brought a group of pre-service teachers from the university to the school, to learn more about the way that technology is embedded in the literacy program at St Stephens. This gave Mollie and Pete an opportunity to speak together about their understanding of a relationship between literacy and technology and their subsequent application of technology to the literacy context. Researcher notes taken during this presentation highlighted the way in which Mollie and Pete have embraced technology and noted the positive response by the pre-service teachers to the presentation:

Pete and Mollie then shared their experiences with podcasting and technology with the pre-service teachers...Pete and Mollie articulated with clarity their understanding of what could be described as the symbiotic relationship between technology and literacy in their presentation to the group of pre-service teachers. They have moved from surface understanding to deep understanding of this relationship. They communicated their understanding and convincingly justified their program to the pre-service teachers. The evidence of this was in feedback from the pre-service teachers. Mollie and Pete showed pre-service teachers what they had been doing with technology and why they were doing it. The pre-service teachers were given the opportunity to ask questions about the program and many took this opportunity and from the pre-service teacher comments and enthusiasm after the session many of the pre-service teachers are beginning to make some connections too! (Researcher Journal)

Of particular interest to the researcher was the way in which Mollie and Pete communicated to the visiting pre-service teachers their belief that it is the responsibility of teachers to integrate technology into the classroom because it is a part of the children's lives:

Mollie and Pete emphasised that technology was part of the children's lives and it requires commitment to an aligning philosophical perspective to bring technology and

literacy to life in the classroom. They emphasised to the pre-service teachers that young children can use and interact with the technology (Macintosh and PCs) in very complex ways and they used the example of Nintendo and Xbox to illustrate this. They highlighted the way in which children can move between the two readily and as teachers they have a responsibility to do this too. (Researcher Journal)

A further opportunity for Mollie to communicate her developing understandings about literacy and technology occurred when the researcher organised a meeting between Susie and Mollie. This meeting came about because Mollie and Pete had expressed an interest in learning about play curriculum. Mollie was interested in visiting Centenary Kindergarten to learn about the play program and to see how Susie was integrating technology into the kindergarten program. Susie in turn, was very interested in finding out more about how Mollie had been integrating technology and literacy in her Preparatory classroom (Researcher Journal). When Mollie and Susie met for the first time researcher notes indicate that they established an instant rapport: “both Mollie and Susie were very comfortable with each other and seemed to have a mutual respect for, and interest in, what the other was doing with technology and their program” (Researcher Journal).

Another change to the program during term four was the placement at the school of a student teacher in her final year of university study: “There is a final year pre-service teachers (PST) at St Stephen’s. Mollie and Pete now have a mentoring role as they need to bring this student along with them on their journey for the next seven weeks” (Researcher Journal). The pre-service teacher was placed in Mollie’s classroom and this placed Mollie in the role of mentor. The researcher noted that the mentoring responsibilities associated with this placement encouraged Mollie to share her learning throughout the study and to provide a rationale for her beliefs and understandings with another educator:

I have noted that Mollie is sharing her beliefs and ideas about literacy and technology with the pre-service teacher and this seems to be assisting her to consolidate her understandings. Mollie has been challenged to provide a rationale for her program and through supporting another to understand the journey she has been on she seems to be strengthening her own learning and beliefs. (Researcher Journal)

As Pete and Mollie worked together planning and teaching the whole school program some organisational changes began to emerge. One of the most obvious was the introduction of ‘*learning on the go*’ (LOG) across the school.

Learning on the go (LOG)

At the beginning of the second cycle the learning opportunities the children were involved in began to expand alongside the introduction of ‘*learning on the go*’ (LOG) in the literacy block and throughout the day. LOG was an organisational approach implemented by Pete to provide children with some control and responsibility for their learning. Mollie introduced LOG to the Preparatory children in at the beginning of the cycle. In Mollie’s classroom LOG enabled children to choose when they completed a set requirement of learning activities and the sequence in which these activities were completed in. The children recorded their names on a table to show their progress toward achieving a

series of activities that were expected to be completed by the end of the week. Figure 5.12 shows an excerpt from the LSJ that describes the way the children used LOG to organise themselves for learning. In her final interview Mollie articulated that she believed LOG assisted the children to work responsibly in the classroom over several days on the many different activities they were involved in throughout the term:

...it’s just talking about the ‘Learning on the Go’ and how we had a checklist and the children worked through which one they wanted to do – ‘Okay, I feel like doing my school story today so I am going to do that .’ ‘I want to do my fifteen minutes of reading,’ or whatever else, and the kids were responsible and got much better at ticking off what they were supposed to be doing. This week I didn’t have fifteen minutes of reading still up because I was wanting to try to finish these stories and put them together, and a couple of children decided that they wanted to have time out and do some reading. (Mollie C5, p. 6)

FIGURE 5.12
Excerpt from Mollie’s LSJ2 describing ‘Learning on the Go’

Dated Commentary of Critical Incidents	Artefact
In the lead up to this term the students had been given more and more responsibility for their own learning. At the beginning of the term we introduced a checklist for a term called ‘Learning on the Go.’ The students responded really well to marking off their list.	Image unavailable Cameron doing his 15 minutes of reading required so he can mark it off the checklist.

In Figure 5.13 photographs 1 and 2 show a child in the senior group using the overhead projector and notebook to record the activities he was working on during the session. Researcher notes taken on a visit noted: “senior children [year one to year five] are responsible for recording LOG choices on the table displayed on computer and projected onto the whiteboard. The purpose of this is so that all children can see what they should be doing at any one time and equipment and notebook computers remain accessible to all (Researcher Journal). The Preparatory children used a similar organisational structure throughout term 4 to assist with their organisation and task completion as shown in Photograph 3 in Figure 5.13. Researcher notes taken on an observational visit after LOG was implemented noted the high level independence in learning that was demonstrated by the children: “Pete and Mollie are working together more closely and ‘Learning on the go’ routines encourage fluid movement between the classrooms. Children are amazingly independent” (Researcher Journal). On another visit it was noted that “‘Learning on the go’ has an integrated technology focus with a mixture of tasks requiring use of ICT. An example of the type of comments children are making since the

FIGURE 5.14

Excerpt from Mollie's LSJ2 describing Children's Interest in the Inquiry

Commentary of Critical Incidents	Artefact
The inquiry topic for this year is “We are the Authors of our own Future,” which has been the drive for the majority of the junior Literacy this term. The students had been dreaming about what is possible on our new school site for over a term, and had been taking photos and looking at the site plan. We had encouraged them to study the plans, then go over to the site. They wanted to explore what they could find, so we encouraged them to become “big ears,” “big eyes,” “shakers” and “rollers,” in which they used their senses to take a closer look for any sign of life, be it wildlife or trees and plants.	The image shows a piece of paper with several lines of handwritten text in blue ink. At the top right, there is a small, colorful drawing of a plant with green leaves and a red flower. The text on the paper includes questions like 'What does it need to grow?', 'Is it sustainable?', and 'What do we need to sustain?'. The handwriting is somewhat cursive and appears to be from a child. Planning for the future: This is an example of brainstorming sheets of what the students dreamt was possible.

The photographs taken by the children were used back in the classroom in a number of projects primarily developed from the children's interests that emerged during the school site visit. Mollie noted in her LSJ that the children's interest in the inquiry was further stimulated by an excursion to the Cranberry Land Care Centre. Figure 5.15 shows the documentation Mollie recorded in the LSJ for the excursion. The documentation highlights the way in which the children gathered information through the collection of artefacts and photographs to support the inquiry. Mollie summarised her documentation for this journal entry in her final interview and highlighted the purpose as being to gather information for, and sustain interest in the inquiry:

...to continue to help the students develop their idea of sustainability they visited Cranberry Land Care site and we had JM and he took us on a bush walk so they were still looking at all the environmental stuff and some groups were scooping for insects in the creek, some children were being the shakers and trying to look for it on the land, and from this children were taking a lot of the photos and this helped provide stimulation and an increased vocab. [vocabulary] for their narrative writing that they did later on. (Mollie C5, p. 2)

The information gathered at the school site visit in October and the Land Care visit in early November was used by the children in the cross curriculum projects that are described in the remainder of this chapter.

FIGURE 5.15

Excerpt from Mollie's LSJ2 detailing Cranberry Land Care Excursion, p.6

Commentary of Critical Incidents	Artefact
To continue to involve the students and develop their idea of sustainability, they visited the Cranberry Land Care site, after a site inspection of the new site. JM from Land Care took us on a bush walk around the site, and allowed us to participate in activities to look for signs of life. One group scooped for insect life in the creek (a possibility at the new site) and the other group looked to bug life in the trees and on the group. The students gained a lot of information to help them on the new site, including the importance of correct tree-planting and an increased vocabulary. A large number of photos were taken by the students to document this excursion, and provide stimulation for future conversation, and direction about where to gather more information in the form of letter writing and interviews.	Excursion to Land Care To learn more about sustainability and to help tune in and provide direction for the new school site the students visited the Cranberry Land Care site.

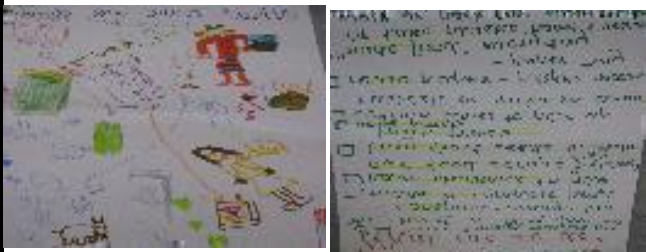
Mollie recorded in her journal that the visit to the school site prompted talk among the children about managing waste at the new school: “The students had also decided that we needed to do something about our waste, and began to discuss ideas” (Mollie LSJ2, p. 3). Back in the classroom Mollie involved the children in another brainstorming activity where their discoveries at the site and new ideas were explored further:

...the students also decided what they needed to do. They needed to do something about our waste. They'd had all this brainstorming and said we needed to do something about our waste. If we are going to be sustainable then we need to have more things like a worm farm and all that sort of stuff. So they had seen what we had been wasting and all that sort of stuff and know that we can do better than this, and things that we do at home and whatever. So in October they continued to brain storm all of their stuff and they had their own site plan and they wrote everything down. (Mollie F5, p. 1)

In Figure 5.16 an excerpt from Mollie's LSJ shows the documentation Mollie recorded to describe the brainstorming that occurred after the school site visit.

FIGURE 5.16

Excerpt from Mollie's LSJ, p. 5

Commentary of Critical Incidents	Artefact
To become involved, the students brainstormed all their ideas for the new site, drawing on where they think the building will be and any other ideas they may have.	 What we have done and can do The students brainstormed what we have already done, as well as what they wanted to do to make the school more sustainable.

In an interview early in the final cycle Mollie described one of the ways in which she hoped to further develop the children's interest in the inquiry using a 1-2-4-8 strategy:

...one of things that we're hoping to create is, when they have finished their site plan, because they've got a site plan of the school and when they finish deciding where the veggie garden and whatever else is going to go there they then create a 3D model of it in their pairs. They have been working with multi aged buddies and then to create that in their pairs so they have to work together and slowly break it down. So we will have 16 of those and then they form a pair to decide well, *'Your veggie garden is here why is it there?'* and ... *'We think it should be here because it needs some extra sunlight,'* *'that's too close to the building you're going to get too much shade,'* ... and then they'll form a site plan not a 3D papier-mâché because we'll be there forever. Then the fours form eights and then they'll make a model here and then slowly we'll be forming down to be just the one. So we know exactly where things are going to go across the road too. (Mollie C4, p. 10)

The idea of podcasting the key ideas and arguments for the school site emerged through discussion that occurred in this interview. The researcher suggested ways in which podcasting could be used by the children to assist them to put together arguments for what stayed in the final plan as the groups combined and the ideas were condensed. Mollie embraced the strategy as she recognised it as similar to what they had been doing in maths:

We probably used it [podcasting of key arguments and ideas] more for maths in groups because they've been coming up with activities or whatever else in a group with problem pictures and those sorts of things but we haven't used it a whole lot in literacy so it would be something that we'd be wanting to have a look at. (Mollie C4, p. 11)

Researcher notes taken on an observational visit also note Mollie's intentions to develop the learning cycle in this way:

Children have a plan of the school and using 1/2/4/8 strategy they are planning the environment of the new school. Children develop suggestions and debate what stays and what goes. At this stage Mollie is not sure how technology will develop although she is considering podcasting for and against to help children make informed decisions. In line with her authentic learning philosophy she said that the use of technology will evolve and find its way into this process. (Researcher Journal)

Mollie's LSJ recording highlighted that the learning experiences continued to build towards a final papier-mâché model:

The students formed pairs to merge their site plan, then merged with another pair to make a group of 4. Using papier-mâché as the base with other materials, the group made a model of this new site plan. This was a great way of engaging many of our students, and reinforcing the concepts about working together. (Mollie LSJ, p. 12)

In her final interview Mollie described the dialogue in groups as leading to decisions being made as the children worked in teams and negotiated ideas to get the model completed:

In October/November the students merged their site plans and they did that again; what their hopes and dreams were. They were put together and then they'd get with another pair so you've got a group of four and then that group of four created the papier-mâché models outside. So they had to do a lot of team work to decide, 'Well I want my veggie garden here,' 'But I want it over here.' 'So where do you think the best place would be to have it?' and that sort of thing. So for a lot of the children that was a good way of engaging them, to actually get them to visualise what was happening. (Mollie F5, p. 5)

The affordances of using technology in a collaborative way were becoming particularly obvious to Mollie in the second cycle. Mollie began to plan for learning experiences where the children would collaborate together using technology. She continued with an integrated approach to applying technology to the literacy context through generating the children's interest in the creation of slowmations.

Learning Episode 7: Slowmations

There were a variety of different learning experiences connected to the overarching inquiry occurring concurrently throughout the literacy block and throughout the day in Mollie's classroom. This cross-curriculum approach was evident in the next learning episode Mollie recorded in the LSJ. As previously noted through their involvement in taking an interest in the building of the new school the children discovered different forms of life at the site. Additionally, in the religious education unit the topic for the term was '*grief and loss*' and Mollie decided to integrate this topic into the broader curriculum focus by using a popular children's book to introduce the children to lifecycles:

Our first unit of RE was 'Grief and Loss.' Every child had lost something; a parent, pet or grandparent. To begin the unit the students discussed what they knew, particularly about the human lifecycle. Then we read 'The Very Hungry Caterpillar', discussing the changes to the caterpillar. (Mollie LSJ2, p. 3)

Mollie provided a planning template for each child and the children chose their own living thing to research the lifecycle and record using drawings and picture. This information was used to create a

‘slowmation’; a simple animation usually created using play dough figures placed flat on a surface similar to the pages in a book:

The students chose a lifecycle to research, and using the planning sheet, investigated how that living thing changes over time. (Mollie LSJ2, p.11)

We’ve already started [‘slowmations’] and a lot of them are up to the play dough. We had a planning template similar to yours, but they’d already started one. It didn’t have the narration column, it was just sort of the combined version and I thought that it was okay anyway. So they’ve got a plan. (Mollie C4, p. 12)

Examples of the lifecycle templates are provided in Figure 5.17. Mollie was particularly pleased with the planning template the children used because the finished plan was joined at the ends in the shape of a circle to model the lifecycle:

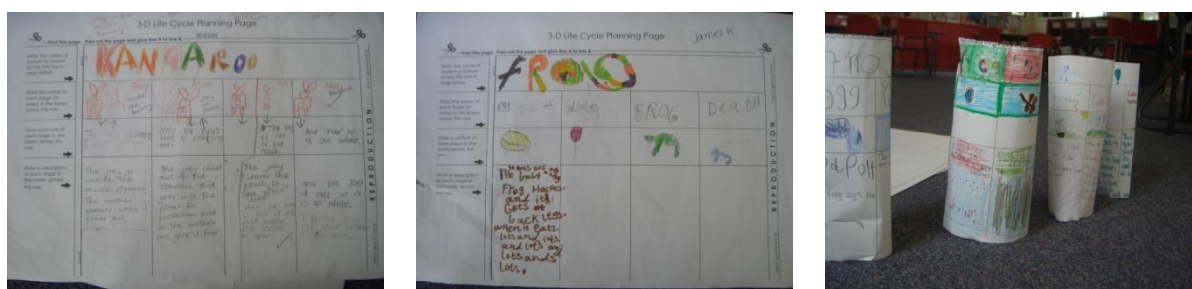
...it was a sheet of paper that you end up sticking together so it becomes a circle like that and so that you can see it’s a life cycle because it keeps going round (Mollie C4, p. 12).

After considering some suggestions put forward by the researcher Mollie decided to apply this concept to the animation and show the children how to use the *loop* button in *Garage Band* to play the lifecycle over and over as another way of reinforcing the life cycle concept:

Yes. Good, *loop*. And that’s why we’ve been, particularly with the seniors, showing them that it’s a life cycle; ‘Okay, so you’ve got the penguin. When does the penguin lay its eggs?’ ‘Oh when it’s an adult! – so then it lays its eggs and then the eggs hatch out,’ and it’s just so they can see the whole thing. (Mollie C4, p. 12)

FIGURE 5.17

Photographs of the Planning Sheets used for Life Cycle Animations.



Following on from this experience Mollie showed the children another child’s simple animation which had been given to her by the researcher as an example of what could be done with young children using animation: “To follow on with ‘The Very Hungry Caterpillar’, we viewed Kate’s [researcher] *slowmation* of the story. In groups, the students then took different aspects of the lifecycle to create using play dough. They photographed each stage to make a group *slowmation*” (Mollie LSJ2, p. 5). For this task Mollie gave each group a stage of the life cycle of the butterfly to create and

the children in groups created their given stage using play dough. After each group created their stage of the lifecycle they photographed it.

Mollie worked with the children to put each stage together in GarageBand and they made a whole class lifecycle animation:

We broke it [life cycle of a butterfly] into the four parts or stages of the life cycle and there were three or four of them [children] in a group, and each group would do one of the photos... They were so good with the photos and it was just like the caterpillar was moving along. We've got a cocoon this big [large] to be a cocoon this big [small] and it's just hilarious. They used the same colour [play dough] which was good. But it was just so funny and they all wanted to do it, like they'd have the photo and it had to be on the screen longer because they would say, 'The caterpillar is coming out of the cocoon. It's almost out of the cocoon. Now it is a beautiful butterfly' and that was just the last stage, and I'm thinking, 'Ah no'. (Mollie C4, p. 11)

The problem described by Mollie in this example was to do with the timing of the photographs and each group's voice over for the animation. To help the children realise that they needed less dialogue and more photographs to match the voice over, the children viewed the sample animation again and were then able to critically reflect on their learning:

...I showed all of the children the one that you had done just for the story and they're saying, 'That's much better because she's got more photos and there's not so much talking'. 'The caterpillar's here and then it's here'. 'There are lots of slow transitions for it', and that was really good yesterday. (Mollie C4, p. 11)

Following on from this the children worked on creating individual 'slowmations': "The children are doing their own now. All of them are doing 'slowmations' for RE [Religious Education] and they're doing a life cycle so we'll just have to wait to see how that goes, which is exciting" (Mollie C4, p. 12).

Mollie's enthusiasm for the 'slowmation' learning experience was evident from the beginning and this was noted in researcher observational visits:

Mollie shared children's animations for life lifecycles ... What was interesting to note was her open enthusiasm for what was happening in her classroom as the children worked on planning and creating 'slowmations' depicting a lifecycle of a living thing. (Researcher Journal)

Mollie was extremely keen to share lifecycle planning sheets and 'slowmations' with me [researcher]. She was very proud of the work the children had done. The children individually planned life cycles and were paired with old/younger partner who had chosen the same animal life cycle to complete the animations. (Researcher Journal)

However, as the children continued to work on creating 'slowmations' it became evident to Mollie that the setting up of each scene for a photograph was very challenging for the Preparatory children. This problem was overcome by pairing each Preparatory child up with a senior child who was researching the same living thing. This process worked better although some children still had difficulty with the number of photographs required. Figure 5.18 shows an excerpt from Mollie's LSJ describing the challenges associated with creating the slowmations and how they were resolved by pairing the

children with buddies. Mollie noted in a mid cycle interview that the learning process from start to finish strongly emphasised the children’s work. In particular, Mollie believed that the podcast recording for the ‘slowmations’ needed to be all the children’s work because the children she believed, were more capable of working through the whole process independently now than earlier in the year:

That’s what they [the children] are so excited about. Everything that we have written down has been exactly their wording. So we’ll write down the sentences it hasn’t been changed or anything, or unless it’s the right tense or something like that. We have done that. It’s not really a pure language experience that we were doing at the start of the year but I thought, ‘No, for the podcast it’s important that they do have that right so it’s the same.’ They can read more now, rather than just at the start of the year how they were saying ‘were’ instead of ‘was’ or something, and they don’t think it’s a different word which is good.(Mollie C4, p. 12)

FIGURE 5.18

Excerpt from Mollie’s LSJ Slowmations pp. 7-9

Dated Commentary of Critical Incidents	Artefact
When creating the ‘slowmation’ the students weren’t too bad with the planning of it, but found it challenging to actually make the animal of their choice. Instead of doing it themselves, they were paired with a senior student. Even then many students struggled with the concept of making the animal “move”, only taking 4 or so photos, instead of 40 or more. I spent the whole of one lesson just looking on the cameras to sort out whose photos were where on which camera. We spent several lessons using the play dough to create their ‘slowmation’ in ‘Garage Band’. The students recorded their voices in the background, then discussed what they learnt. The photos seemed to take a long time to create, and most groups found it challenging to grasp the concept.	Lifecycle plan Some students found it difficult to complete their plan even though they had researched and knew what to write. Lifecycle of a tree Some students found it hard to make the ‘slowmation’ look like it was ‘moving’. These two photos show how a tree quickly gets leaves, rather than adding them on slowly over several photos.

In reflections documented in the LSJ Mollie expressed satisfaction with the way the children demonstrated they could take responsibility for the completion of ‘slowmation’ even if it meant spending some of their own time on it:

The students knew what their lifecycle was, and were all able to know what needed to be done to complete it. They knew that if it wasn't completed, it just wouldn't go on their USB sticks to go home. A couple of pairs even worked several lunchtimes to get their 'slowmation' completed! (Mollie LSJ2, p. 13)

The extract from Mollie's LSJ (*Figure 5.18*) shows that Mollie documented that the children "discussed what they had learnt" (Mollie LSJ2, p. 11). On a researcher visit to the school the researcher viewed the finished animations. The children were eager to share their work and it was particularly interesting to note that the children reflected about their learning in terms of the inquiry rather than the use of the technology or technology skills:

The children had each added a photograph of themselves at the end of the 'slowmation' and attached a podcast recording to this describing what they had learned throughout the process. I talked to some of the children about their animations and they were keen to tell me about their learning about lifecycles- *not* about the technology they used or the technology skills they developed. (Researcher Journal)

Figure 5.19 shows screen captures of a finished 'slowmation' from Meg; Grade Prep and Sam; Grade Two. From this example it can be noted that the children's reflections focussed on the inquiry learning:

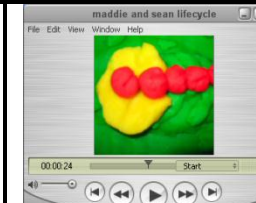
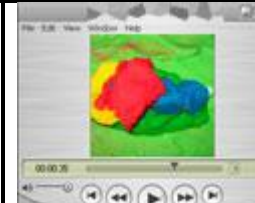
"I learnt that the butterfly has to split the cocoon." (Sam, Grade Two)

"I learnt that another name for a cocoon is a chrysalis." (Meg, Preparatory)

The realisation that the application of technology to the literacy context in a process orientated way appeared to foster learning beyond the novelty further prompted Mollie to continue integrating technology in this way. Mollie was eager to use the podcasting software again in the writing process and creating a timeline of events towards the construction of the new school became the springboard for the next learning episode.

FIGURE 5.19

Screen Captures and Transcript from Meg and Sam's 'slowmation'

			
The Life cycle of a butterfly. (Meg)	The butterfly lays the eggs... (Sam)	...so the caterpillar can be born (Sam)	Then it hatches little bit... (Meg)
			
...by little bit. (Meg)	Then it eats to grow and it sheds its skin. (Sam)	Then it goes in a cocoon. (Meg)	It builds a cocoon around itself very lazily. (Sam)
			
But before it does that it needs to attach itself to a branch. (Sam)	The caterpillar eats its way out... (Meg)	...and then it wiggles itself out. (Meg)	Then it turns into a butterfly with all sorts of colours... (Sam)
	Image unavailable	Image unavailable	
...blue, red, yellow and green, purple and orange. (Sam)	I learnt that the butterfly has to split the cocoon.(Sam)	I learnt that another name for a cocoon is a chrysalis. (Meg)	

Learning Episode 8: The Story of St Stephen's – A School Based Podcast of the Timeline of Events

After a visit to the construction site of the new school, with the children one afternoon, the idea for a school based podcast of the timeline of events leading to the construction of the new school was generated. The children had taken many photographs at the site and since the beginning of the school year and the creation of a timeline podcast recording to share with the school community was one way to reflect on the journey they had all been through. Mollie created a timeline template for the children to use to assist with sequencing the events in their individual timelines and incorporate the photographs that had been taken throughout the year. Figure 5.20 shows an excerpt from the LSJ outlining the process children went through to create their own timelines.

FIGURE 5.20

Excerpt from Mollie's LSJ showing Documentation for St Stephen's podcast.

Commentary of Critical Incidents	Artefact
The students viewed the photos they had taken, as well as others taken along the way to record milestone events of the school. They decided which events were the most important, and created a podcast to tell the story of St Stephen's thus far. The photos were dragged in to match their descriptions of the events.	 Milestone events The students chose the events they thought told the story of St Stephen's so far. The events were highlighted and they used this to tell the story onto a podcast.

As noted in the researcher journal, at the same time that Mollie's Preparatory children were completing the timeline planning templates, Pete together with the children in year one to year five, had created a large timeline of events that covered the portable whiteboard in a shared working area (Figure 5.21). The Preparatory children soon found this resource and used it to assist them with their timelines:

The children in years one to five are working on developing a podcast showing the timeline of the development of the new school. They have created a large timeline using photographs taken throughout the year and at the new school site during the visit. The children are using this to assist them in preparing their individual podcast scripts. The children are encouraged to use the timeline to assist them to verbalise their thoughts using a podcast if necessary, write a draft, and make a final recording integrating photographs. Pete said that he introduced the timelines to assist the children in their organisation. The Prep children have discovered the large timeline and they are also using it to help them complete their planning templates. (Researcher Journal)

In a mid cycle interview Mollie described the way in which the Preparatory children used the large timeline as a group sequencing activity where the sequence of events was organised into the correct order and how they then used this information to create individual time lines:

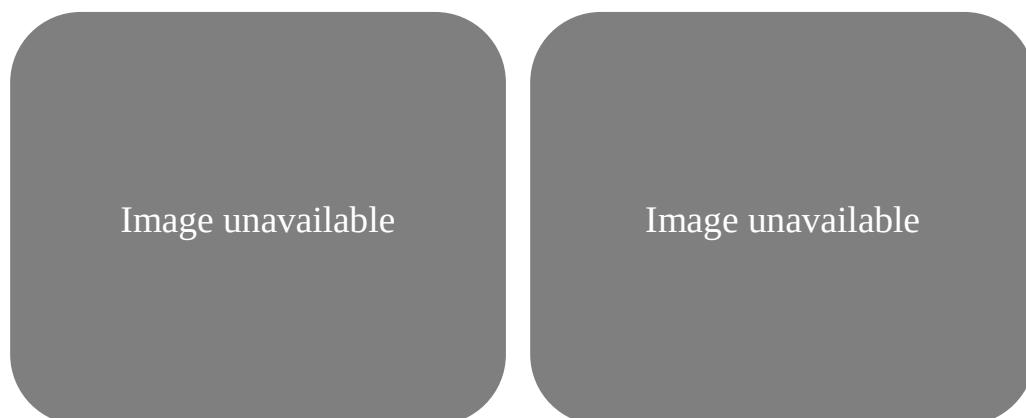
Then using the photos that they'd taken and that Pete had taken and that I had taken along the way of the milestone events we did the time line and they highlighted the ones they wanted to use. They first of all sequenced the events they all had. Well, with the junior children they all had an event and they had to sequence them. So we had the time line and they highlighted the events that they thought were most important, and then they told the story of St Stephen's so far, just using the photos and then dragging the pictures to match. They created a podcast there. (Mollie F5, p. 1)

Some children worked on these school based podcasts in LOG during the integrated literacy session and others worked on different tasks. The photograph in Figure 5.21 shows Ned working on his podcast while others around him have chosen to work on other literacy tasks from the LOG checklist.

Mollie found that the timeline activity supported children in their preparation for the podcast but when it came to recording the podcast further challenges arose as detailed below.

FIGURE 5.21

Large ‘Story of St Stephen’s’ Timeline and Ned recording his Timeline Podcast.



In her LSJ Mollie identified three emerging issues as the school story school based podcasts progressed; saving files correctly in the correct place, choosing appropriate photographs to include in the school based podcasts and supporting children who had not been at the school since the beginning of the journey. The first issue was saving files:

One of the difficulties of the students independently creating the podcast of the school stories is ensuring the students are using the correct saving process. Several students couldn't find podcasts that were completed and saved, but saved either on a desktop or in someone else's folder. Several students also completed the podcast, but didn't choose the save option. This meant they had to do it again. This was also true when the students were creating the 'slowmation' of their lifecycle. (Mollie LSJ2, p. 8)

...when the students were creating the school stories we had to be really careful with the saving process because some children, particularly when we've been going to save things to their USB to send home, we've looked at some children have had maybe 5 or 6 school stories that were saved as them, and you had to go and find which was the right one, and they couldn't find it themselves so they would then go and start another one and keep starting new ones. So it was another explicit teaching moment on how to save properly and just finding it as well, and, 'Okay maybe I've looked in someone else's folder and I haven't bothered saving it to my own folder. I've just left it on whoever's folder was there using it before I got it,' so maybe looking to see and remembering if they saved it to the desktop or what they've done. (Mollie C5, p. 2)

Mollie reiterated her conviction that the work must be the children's and after modelling the correct process for saving again to the children, conceded that some "had to do it again" (Mollie LSJ2, p.8). The second issue had first arisen in the cycle one when the children created e-books, so Mollie resolved the issue of too many photographs easily by creating a folder of suitable photographs for the children to choose from:

Another challenge with the school story was the amount of photos available for the students to choose from. This was narrowed, making the choosing of photos much easier. (Mollie LSJ2, p. 8)

In her final reflections Mollie described the way she narrowed down the selections from approximately one hundred photographs to twenty by creating a new folder:

Another challenge that we had was when they were doing the school story there was something ridiculous, like 100 photos, for the children to choose from. Of just the one event there would be 20 photos, so the children were forever looking at which photo they wanted to have. So we had to narrow that down and the seniors had a folder with the photos in it and then we had a Prep's school story photos which only had about two photos, so they could choose from two photos for each event. The folder had about 20 photos in it for them. (Mollie F5, p. 3)

The final issue in relation to this learning episode that was identified by Mollie required further consideration, as some of the children came to St Stephen's from other schools during the year and were not involved in the story from the beginning. Mollie resolved this issue by encouraging these children to interview other children in the classroom in order to gather the information that was required:

Some students found it hard to relate to activities that had happened before they arrived at school. We helped fix this challenge by encouraging them to interview or get background information about the event so they knew how people were feeling at the time. (Mollie LSJ2, p. 8)

Mollie provided further insight into this dilemma in her final interview:

Some of the students found it hard to relate to some of the activities that happened before they were here so the putting up of the building they weren't here they didn't see it so it was hard for them to see. They all know a lot about the new portable because they were here and they saw it happen. So we had to try and get them to ask questions of people that were here, '*How did you feel?*', '*What was happening?*', '*How many trucks did you have?*' all that sort of stuff; trying to get them to put it in the perspective of the people that were there. (Mollie F5, p. 3)

The final school based podcasts were shared with the school community and sent home to families on USB sticks as part of each child's learning journal. An example of one of the school based podcasts is represented in screen captures and transcript of the recording in the Figure 5.22.

FIGURE 5.22

Screen Captures and Transcript of ‘The story of St Stephen’s’ from a Preparatory Child.

Image unavailable	Image unavailable	Image unavailable
Pete got the job of principal in October.	Some people chose the name of St Stephen’s in July.	In September Mollie was the first teacher.
	Image unavailable	Image unavailable
In October the six truck were there and they were putting the building together.	In November it was the first orientation day for the St Stephen’s children.	In December Dot was hired.
Image unavailable	Image unavailable	Image unavailable
In January it was our first school day.	In February the sandpit was built by a couple of dads.	In October we took a photo at our new site with Anthony the builder.

In her final reflections on ‘The Story of St Stephen’s’ school based podcasting experience Mollie believed that the use of technology had been integrated throughout and taken for granted as being a part of what happens in the classroom:

...even just simple things like the time line in here we’ve printed off... And the sheets and things like that, and even printing off the photos that Pete and the children had taken, and putting them in an order and writing, and so many different things like that. You just print off the photos and they’re done and then you’ve just got to photocopy. You just use technology for everything and you don’t even think twice and you get frustrated when it doesn’t work. (Mollie C4, p. 13)

Mollie also believed that the building of the new school provided an authentic context for learning which engaged the children in the learning experience. In particular, Mollie believed the children’s engagement in the sequencing of the timeline and creation of the recount was partly due to the authentic context provided through the construction of the new school:

...we're so lucky that we've got this experience that you're not making up stuff that's not there. You know, how when you sequence stuff quite often it'll be a story or something else. This is a real life story that they actually understand and "Ah, so we can't have a driveway before we have a building, we can't have the ramp before we have the building, but Pete was hired before" you know... (Mollie C5, p. 13)

Mollie further provided examples of the children's motivation to learn and complete the podcast to the best of their ability. She described an example where two young boys worked together to correct an error in sentence structure that became evident when they listened to their recording and an example of a young child who had some difficulty with sentence structure and use of language but given support persisted with the task:

It's [podcasting] the best oral language thing for them. I'm just pumped with the way the two boys would listen to themselves and say, '*It doesn't sound right so delete it and go again.*'... I was so excited when I saw that yesterday and even little Ben, he's struggling with his speech and he was working really hard to do that yesterday too. He could read what I had written on the page and I was saying to him, '*Yes, but does that make sense? First principal hire Pete Timms?*' I said, '*Let's have a look at the word Timms, do you see a 'o' sound at the end?*' '*Oh no, just an 'i', 'it's Pete Timms'*... but then I said '*Does that make sense? First principal hire Pete Tom? That's not a sentence is it?*' and really working to develop it and that was good for him. It's so much oral language for him it's just wonderful. (Mollie C3, p. 3)

Mollie believed that the way that the children used the notebook computers and *Garage Band* software to create school based podcasts fostered independence in learning because the children were given responsibility for completing the work themselves. In reference to the children being able to use the program, replay their recordings to gain instant feedback and make changes if necessary Mollie believed this gave the children control over their learning:

Being so easy and for them know that they're in control of it [podcast] too. They love the power of that you know, and they all do this if you just go over 'Go away, get your hands off. This is my computer'. Which is really good too because they've got that ownership then of knowing that they've done it themselves. (Mollie C3, p. 3)

The independence demonstrated by the children when using technology in the classroom provided impetus for Mollie to continue to use the technology in innovative ways that she had not used before in an early years classroom. One experience that Mollie was eager to explore again now that the children were working more independently was the creation of a newsletter. This time around the learning experience was to be a newspaper and the implementation was quite different to the previously described learning episode.

Learning Episode 9: Creating a Newspaper Article

In her LSJ Mollie noted that the children's interest in sharing their hopes and dreams for the new school and the creation of the timeline school based podcasts provided impetus to take the inquiry further through the creation of a newspaper article:

Using the important events, along with their dreams and hopes from the site plan we created a newspaper article. The students were given the job of being a newspaper

reporter writing about ‘the new school’. This was drafted and then published in the word processing program, ‘Pages’, which gave the students templates to help them look legitimate. They looked awesome! (Mollie LSJ2, p. 11)

...one of the ways that they did present their dreams and their hopes for the site plans was to create the newspaper article that we were talking about before in the role of the newspaper reporter. (Mollie F5, p. 5)

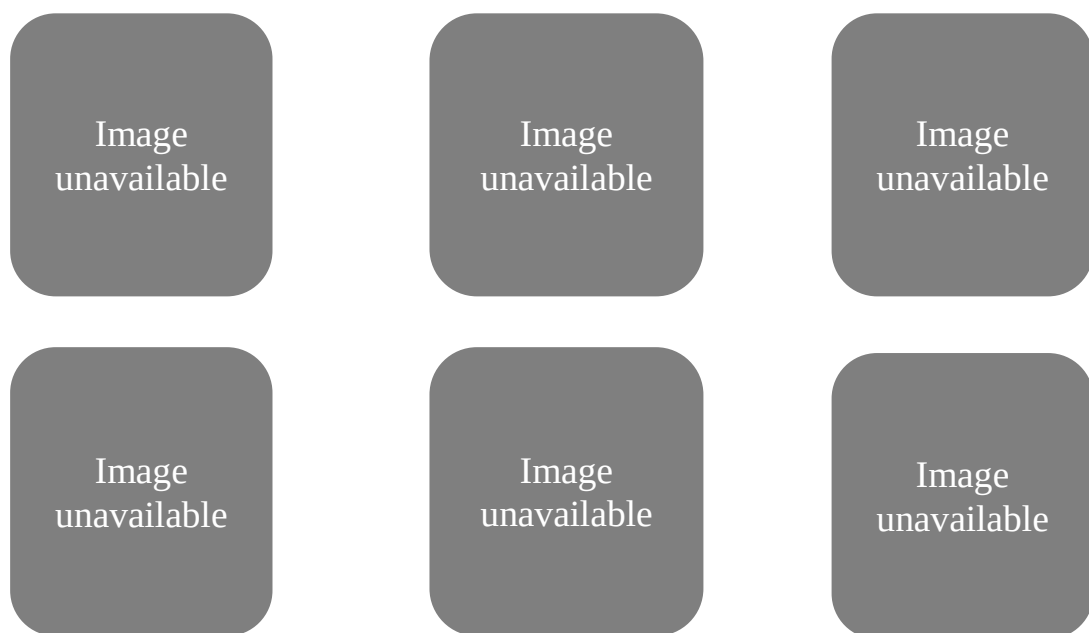
Mollie saw the creation of the newspaper article as a way to bring together the threads of the learning that had been developed through the inquiry:

From all their photos and from all the things that they focused on they created the newspaper article pretending to be the newspaper reporter for what was happening as well. (Mollie F5, p. 2)

Mollie described the children’s final newspaper as the result of “lots of drafting and sentence starters” (Mollie LSJ2, p. 10). Some examples of the children’s draft and finished newspaper articles are displayed in Figure 5.23.

FIGURE 5.23

Children’s Draft Books and Published Newspaper Articles.



Note: John is working on the publication of his newspaper article.

Mollie described that one of the challenges that arose during this learning episode when the children began to type up their newsletters was due to their unfamiliarity with using the keyboard on the notebook computer for typing: “The students had worked with ‘PAGES’ before but they are still really unfamiliar with the keyboard, making the typing process very slow. Hence, the need for adult assistance to speed up the process” (Mollie LSJ2, p. 8). In her final interview Mollie reflected on this learning experience and noted that for some children she had to assist with the typing in order to get the newsletters completed:

Some of the students, when they were doing their newspaper article, they'd worked with PAGES before but they still, really as you'd expect 5 & 6 years old to be, were unfamiliar with the keyboard, so it took a long time and we had to type up bits and pieces and fill in the gaps. They would do a word – you'd do 10, that sort of stuff. They were good though with the dragging in of the photos and they knew a lot of them. (Mollie F5, p. 3)

Although some challenges with using the technology remained during this task Mollie believed they were not unexpected given the age of the children. The final learning episode described by Mollie provided a snapshot of both Mollie and the children's learning with technology applied to the literacy context throughout the cycles. The learning episode re-visited the narrative text type structure introduced in cycle one however this time the use of technology was interwoven throughout the learning process.

Learning Episode 10: School Narratives

The final learning experience documented by Mollie in the LSJ ran parallel in the literacy session to the other learning experiences described. Again, the visit to the school site and the excursion to the Cranberry Land Care Centre had provided stimulus for the creation of narratives:

The excursion [Cranberry Land Care Centre] allowed the junior students to be exposed to different forms of wildlife and ideas for the planning of their narrative. The students had to pretend they were an animal on the new site [school site] and complete a plan in the form of a week, gaining feedback from their peers about how their story was shaping up. (Mollie LSJ2, p. 7)

In the documentation the plan that Mollie was referring to was a template with each day of the week represented in a table with cells for the children to draw and write their ideas. Mollie expected the children to plan a story with a beginning, middle and end spread out over the week, using the school site as a setting and living things from the site as characters. Mollie explained "they planned for it over the 7 days. The problem had to be somewhere in the middle on the Wednesday and Thursday" (Mollie C5, p. 2). Mollie supported the children in the planning process by including narratives in the program and deconstructing the text with the children:

...we had a lot of narratives that we were reading, and the children were reading in their own reading. Together we were, as a shared reading, looking at the narratives and some of the problems that we can have. So the children knew that a narrative had to have a beginning, middle and an end. It had to have a problem in the middle. So we said, 'Right, when is the middle of the week, the problem has to be somewhere in the middle there and you have to be able to resolve it'. So they planned that and then they wrote something that was happening on each day so Monday, Tuesday, and Wednesday, whatever, and then after they'd written each day they'd be able to paint the picture. That was their art, their illustrations for it. (Mollie F5, p. 2)

In order to support the children in the process of writing their narrative Mollie recorded some instructions for drafting the narrative and put these instructions onto the I-Touches. The transcript in Figure 5.24 shows the instructions that Mollie recorded to assist the children in organising themselves for this task. Mollie encouraged the children to listen to the instructions on the I-Touch whenever they

needed help with the writing process. Researcher notes taken on an observational visit noted that the children referred to the I-Touch instructions when they needed to check organisational details ensuring that any support sought from Mollie related to the literacy learning:

Mollie has podcasted the instructions for the school narrative and put the recording onto the I-Touches. The children are using the I-Touches when they need to check the steps involved in writing their narrative. Those children who seek further help from Mollie have either checked the instructions on the I-Touch first and require further assistance, or they have questions about what they are writing such as, 'I need help to make my story more interesting'. (Researcher Journal)

Although the structures described in this learning episode were implemented to support children in their writing, Mollie noted that some children had difficulty creating a resolution for their narratives: "although the narrative was set out in the form of a week to assist with the structure of where to place the events, some students were challenged by the idea of having to solve their problem" (Mollie LSJ2, p. 9). This observation was also reiterated by Mollie in her final interview:

Although the narrative was set out in the form of a week so they knew that the problem had to be there somewhere in the middle and they could actually see it, some of them found it hard. They had great problems but some of them found it really hard to actually solve their problems. We brainstormed a lot of the problems they could have and which animal they would have but some of them are like '*Oh yes, and then he could get eaten by this*', '*Yes but how are you going to finish the story?*', '*Don't know,*' – not wanting to solve it. (Mollie F5, p. 3)

John was one student who found it particularly difficult to decide on a resolution and finish his narrative. According to Mollie, John had "too many problems and no resolutions" (Mollie LSJ2, p.9). Mollie noted that John required extra support to complete his story:

And the likes of John... his original plan had about 20 problems none of which were solved. They were all just like '*and then the builder went and died in the hospital*' and there was no way of finishing the story. So we had to really fine tune this with him and as he just tended to waffle. So, it was really saying, '*What is my biggest problem and how do I make it be like a real story?*', so that was one of other ones. (Mollie F5, p. 3)

Mollie believed that John and others like him needed further scaffolding to ensure they experienced success.

FIGURE 5.24

Transcript of Mollie's Podcast of School Narrative Instructions

I-Touch instructions for creating a 'school narrative'.

When we write a story it is called a narrative.

One of your 'Learning on the go' tasks at the minute is to create your own narrative.

You have done your planning and decided your characters and your problem and how you're going to fix your problem, and you've planned what is happening on each day.

Now your job is to actually write an interesting story.

To get started look at what you've got for Monday. What pictures have you got? What characters have you got? How are you going to introduce your characters?

Then when you've got it in your head what you want to write look for an interesting sentence starter. There are lots of these up the front of the classroom.

After you have written about Monday you can start on Tuesday.

What do you want to say on Tuesday? What else do you want to tell us about your character? What else is going to start to happen in your story? You can use the sentence starters again to make it sound interesting.

When you finish Tuesday you're up to Wednesday. Wednesday and Thursday is where your problem should start to be happening.

What is your problem? What is an interesting way that you can tell the people who are going to read your story what's happening? Make sure you use lots of different sentence starters and you're not just saying, 'And then...'

When you've told us about your problem on Wednesday and Thursday start to write up Friday.

How are you going to fix the problem? What solutions have you got for your problem?

Look at what you've got on your planning sheet to help you.

The look at what you've got for Saturday and Sunday.

How do you finish off the story? What interesting things are happening?

Write about Saturday and then finish the story off by writing about what happens to your character on Sunday.

When you have finished read over your work.

Look for any capital letters that need to be there. Make sure you have full stops at the end of your sentences.

Check to see if it makes sense. Are there any more interesting words I can put in? So instead of just putting in 'the tree' you might say 'the beautiful tree' or 'the green tree'. These are called adjectives or describing words.

When you've finished editing or reading over your work read through it with a partner so that they can see if it makes sense as well. They might have some more thoughts on how to make it better, or tell you about a part that doesn't make sense.

When you have finished this you are up to the 'teacher conference' and you're close to having your book published.

After your 'teacher conference' your writing will be typed up so that you can make a book.

During a researcher observational visit the researcher shared some information about the validity of using 'share circles' with young children and this seemed to stimulate Mollie's interest in using this reflection and feedback strategy with the children:

We discussed the possibility of using 'share circles' to encourage further depth of learning through critical reflection on each other's narratives. This idea came from the Australian Literacy Educators (ALEA) Conference at Australian Centre for Moving Image (ACMI) in Melbourne. Mollie suggested that she could get the children to share examples on a draft storyboard and use the feedback in editing process before publication...Mollie seemed keen to try 'share circles' with the narratives she is

currently working on with the Prep children. These narratives are being written from different perspectives of animals in the environment of the construction of the new school (i.e. point of view of an ant, butterfly, bird etc.). After our discussion Mollie decided to try using ‘share circles’ as a means of the children providing and using feedback from their peers to improve the narratives. (Researcher Journal)

When it came to implementing ‘share circles’ in the classroom, Mollie placed a notebook computer in the middle of the ‘share circle’ and each child sharing their draft and the feedback provided from their peers was recorded for the children to use, as needed, to refine their narratives. Researcher notes recorded: “the children shared their narratives and gave feedback to each other. Digital voice recordings of each oral presentation of their drafts and the student feedback were recorded. The children were then encouraged to use their individual recordings of draft feedback to assist them to improve on their writing and publication of the narrative” (Researcher Journal). Photographs taken during this session of the children sharing and recording their drafts and feedback are displayed in Figure 5.25. Mollie documented in her LSJ that this activity helped children to listen to their own stories and those of others and provide appropriate feedback about the storyline:

The discussions with their peers helped with this [solving the complication], enabling them to receive feedback [verbal and recorded for later use] about how clear their storyline was. Initially in this feedback process the students were critiquing the voices used to share the plan, but they eventually realised to listen to what was actually happening in the story. (Mollie LSJ2, p. 9)

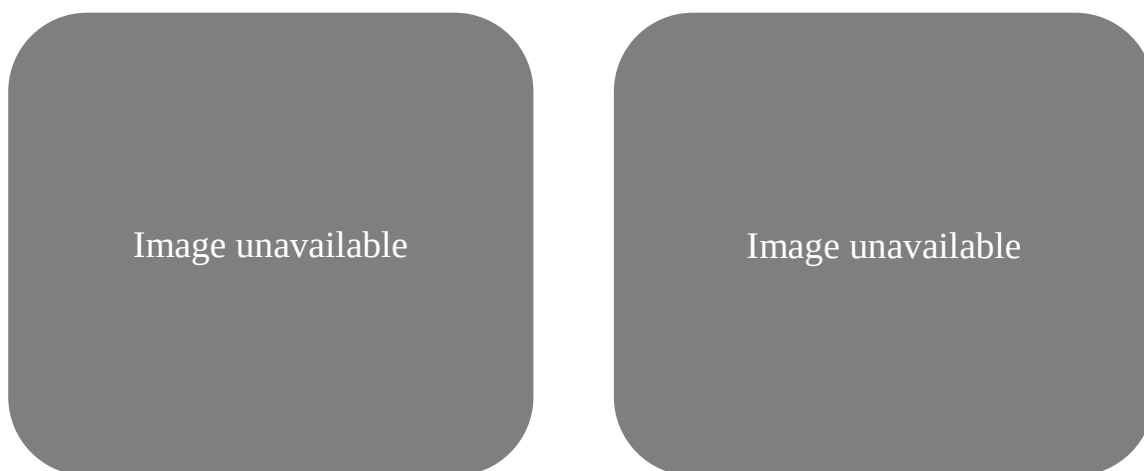
Two examples of the feedback that was given to a child on their narrative are:

“It doesn’t really make a sentence because a ladybird wouldn’t get married” (Samuel, Preparatory)

“She could say Mani is the ladybug because people might think, ‘Who’s that?’” (Ashley, Preparatory)

FIGURE 5.25

Photographs of a ‘Share Circle’ using Podcasting Software to Record Children’s Feedback



Note: Children are recording the sharing of their drafts and the feedback given by their peers as a podcast for children to use to assist them to improve their final publications

Mollie expressed in her reflection on the feedback process that she believed the audio recorded 'share circle' to be a very worthwhile experience for the children:

The discussion with their peers helped it though, as well with the sharing time... After they'd created their plan they were sharing it with their peers, it took them a while though, some of the children gave feedback like, *'Oh, you need to slow down with your voice,'* and I'd say, *'No, you're not listening to the voice, you're thinking about the story, how could you make it more interesting, how could you solve the problem?'*. So some of the children gave good feedback there which helped make sure it was a great result. (Mollie F5, p. 3)

Of particular interest to Mollie was the way in which the feedback the children gave to each other improved after she drew their attention to providing feedback on the story structure and ideas rather than expression and fluency of the reading of the draft version:

They listened, they explained what was happening in their draft and then they tried to get the feedback from their peers. So some of the likes of Nellie, it was very, very basic in what she was doing because she didn't want to make a mistake. She wanted to keep it simple. And Samuel has all these great big ideas so he was saying to her about, *'Oh you could do this', 'You could make it more interesting by doing this'* and *'You could add a better problem like this'* and so there was creativity and it helped make the story more interesting too, which was good. Something we could definitely work at, but it was good because a lot of them said things like, *'You need to slow down because your voice is too rushed'* and I'd say, *'Stop focusing on the voice'*. So if you listen to those [podcasts] you'll hear all that. (Mollie C5, p. 4)

After the 'share circle' was finished Mollie encouraged the children to listen to the recording to help remember the feedback they were given and to use this feedback in their writing: "once we finished speaking about it they could listen to it themselves and use it to help with their drafts" (Mollie C5, p. 4). In this way the children used the recordings to assist them to further refine their writing.

Another concern that Mollie had about the children's narrative drafts was the difficulty some children experienced in expanding on the simple sentences they had used in their plan to improve their story writing:

Another problem we had with the narrative was that some students found it hard to expand on what was written on their plan. They used almost exactly the same sentences (but with the interesting sentence starters at the beginning). (Mollie LSJ2, p. 9)

According to Molly some of the children had a good plan but needed to expand on their ideas for the final draft:

Some of them actually had a really good plan there, and we'd assisted with writing what was happening on the page because they'd drawn the pictures to match it, but some of them found it hard to expand then on that sentence. They'd rather just copy [from their plan], *'And then Nardia went to the new tree'*. So we had to try and get them to say, *'Okay that might be what's happening but we need more information on Nardia going to the tree. What's the tree like? What would she have said? How would she have felt?'* So the way we tried to get them to expand was to look at the feelings and what would they have said and to add to it. Even if they wanted to started off with that and then expand on it below. That's what we ended up doing with a lot of them;

'Nardia then went to the tree. She was feeling...' whatever, so that there was more information. So yes, also looking at adjectives too; to make it not just 'The tree' well, 'What was the tree like?' (Mollie C5, p. 5)

Mollie resolved this issue by bringing into the literacy session an explicit teaching focus on adjectives: “a big focus on adjectives and talking helped the students expand on their sentences” (Mollie LSJ2, p. 9).

After the ‘share circle’ Mollie noted that the children continued to provide each other with support to improve their narratives:

It was good after they’d written it [draft] too; the students became editors, not only of their own work but also each other’s. So we just did a basic editing so they would look for spelling mistakes of words that they knew, and whether or not it looked right, and punctuation, and whether or not it was interesting and it made sense. So just a simple editing, ‘That doesn’t make sense, you need to add this word here,’... (Mollie C5, p. 5)

The students became editors of not only their own work, but also each other’s. (Mollie LSJ2, p. 12)

The children in Mollie’s class worked on the school narratives during ‘Learning on the Go’. The children had some choice over the working space they used and used both indoor and outdoor spaces:

Some children were involved in lots of careful planning of school narrative drafts and plans across the school from Prep to Year Five. Other children were preparing for lifecycle ‘slowmations’ or typing school newspaper articles on the MAC notebook computers. All children were very engaged in what they were doing and all tasks were part of ‘Learning on the Go’. Children from all year levels in the school were sharing the workspace in a fluid arrangement where children moved between the two classrooms and shared spaces inside and outside. (Researcher Journal)

When the children completed their writing drafts they were able to work on their publication. This involved painting a picture for each page of their story and writing, or in some cases, typing the final text. Mollie described this process in her LSJ:

After the students completed their plan about an animal on the new site, they began to write their good copy, using their plan as a guide. After each day was written, the students were able to paint a picture about what had happened on that day to accompany the writing. (Mollie LSJ2, p. 12)

Although the children were very busy during LOG Mollie observed, “It was the same students that we seemed to be chasing to get their writing completed to come out to paint” (Mollie LSJ2, p.12). Mollie intervened in the publication process and typed some of the pages for some children who were running out of time to complete the whole process by themselves:

After that [editing] was finished the children started to type it [school narrative]. We just finished typing it... (Mollie C5, p. 6).

Following this each child’s text was printed page by page and the children sequenced the text and matched the text to their art work:

“...they were given the days just in a lump and they had to sequence them and stick them on to their pages [paintings]. (Mollie F5, p. 6)

A further conversation between Mollie and the researcher involved the researcher sharing some student books made by scanning student art work used to illustrate the story. Mollie liked this suggestion and to provide a professional finish to the children’s publications each page was photographed or scanned into the computer and printed out in colour as a small B5 book. The covers were then laminated and the pages put together in a final publication. The children also created an e-book; “either a photo was taken or they were scanned and then they were dragged in. They recorded their voice of the story...” (Mollie C5, p. 5). Mollie documented the publication process in her LSJ and the excerpt in Figure 5.26 shows her description of the children’s involvement in this learning experience.

FIGURE 5.26

Excerpt from Mollie’s LSJ2 describing Publishing the School Narratives.

Dated Commentary of Critical Incidents	Artefact
This corrected narrative was typed and jumbled. The students had to sequence the text and stick it onto the pictures. Many students only looked at the initial sound when sequencing, confusing Tuesday/Thursday and Saturday/Sunday. The stories were recorded into ‘Garage Band’ to make an e-book, with scans of the paintings being dragged in to accompany their voice.	 Narrative An example of the narrative artwork and matching text that the students took home. Each of the books were scanned and ‘printed’ so they can be at school to share with other people forever!

In the excerpt in Figure 5.26 Mollie recorded the observation that many of the Preparatory children used initial letter information to help them sequence their text. Mollie also noted that the published books became a popular addition to the classroom: “they were really interested in the stories that other people created. It was good. For Preps they were pretty good” (Mollie F5, p. 8). Mollie was pleased when the interest in the school narratives extended beyond the Preparatory classroom:

This afternoon a lot of the seniors got them [school narratives] out to have a look at and a few of the children kept going over saying, ‘*Oh, Ellie loved this about my book*’. And they laughed at Johns’ *something* and all this sort of stuff. So it was really nice. They were really proud of their books and the seniors [grade one to grade five children] thought they were wonderful too. (Mollie F5, p. 8)

Mollie believed that the popularity of the books provided, for one child in particular, the opportunity to share his unique interests and through his engagement in the learning experience highlighted his development of a responsible learning attitude:

He [Sam] loved the narratives; he loved using his imagination, he loved being able to record his voice and being able to help other people out. Yes, that's right he's really come on. Taking responsibility that's him, this term particularly – he's really matured, that's good... There have been lots of little instances where he's been wanting to get things written and the words that he's been writing as well. A lot of the children struggled to read some of the words that he had in his book today because they were things to do with the bulldozer, and when the snakes were coming there were a couple of words in there where I thought, '*Oh Samuel that's fantastic.*' Some of the things that he was using; he's a clever little boy so it was nice for him to have that [praise] and he was so proud, which was good. (Mollie F5, p. 9).

An example of one of the school narratives final publications is provided in Figure 5.27. The narrative was created by a Preparatory child in Mollie's classroom.

In her final reflections Mollie acknowledged that creating the school narratives highlighted that working with technology in a way that involves children heavily in the process is manageable:

...the thing is though, we helped the children with their school stories, [Story of St Stephen's timeline podcast], but those narratives, every single thing other than the printing out was done by the children. Everything. So it's a manageable thing. (Mollie F5, p. 16)

FIGURE 5.27

Student Work Sample: School Narrative



Nellie, Preparatory

Learning Episode 11: Maths Interviews

In her LSJ Mollie referred to one final learning episode that was significant. Mollie described the way in which the children had been using the technique of interviewing to show their understanding of mathematical concepts. This was an activity that Mollie and Pete worked on together with the children across the school. In this learning episode the Preparatory children worked in pairs to interview each other about the maths they had been doing with potatoes: “Well the last thing that we’ve both [Pete and Mollie] just done there was an interview. To record their understandings there was the interview with the partner about the maths that they’d been doing” (Mollie F5, p. 12).

In Figure 5.28 a transcript of one of the Preparatory children’s interviews is recorded. The interview transcript reveals the questions students prepared for the interview and the interviewee response to the questions. In her reflection on this learning activity Mollie noted that the interview provided a way, other than the completion of a written report or worksheet, for children to demonstrate understanding and problem solving relating to mathematical concepts and processes:

The children were reflecting on, they chose one of the problems and were reflecting on their learning in the problems, and some of the challenges and some of the discoveries. They recorded that with a partner as an interview rather than writing it or doing a worksheet or something too. (Mollie F5, p. 12)

FIGURE 5.28

Transcript of ‘Spud Maths’ Interview

Interview Transcript for Spud Maths Interview – Nellie and Laura	
Laura	Welcome to this interview Nellie
Nellie	It’s a pleasure to be here Laura.
Laura	What did you name your potato Nellie?
Nellie	I named my potato Lucy.
Laura	How did you decorate it Nellie?
Nellie	I used wool for the hair and pom-poms for the eyes, nose and mouth and toothpicks for the arms and legs and a patty pan for the skirt.
Laura	Where about did your potato come in the line Nellie?
Nellie	Third in the line.
Laura	What different ways did you use to measure your potato Nellie?
Nellie	We use measuring tapes and the weighing scales.
Laura	What happened when you placed your potato In the water?
Nellie	It got higher and dirty Laura?
Laura	Who had the largest potato and who had the smallest?
Nellie	Megan had the biggest and Charles had the smallest?
Laura	How long around your potato’s tummy?
Nellie	Fifteen
Laura	How long from top to bottom is your potato?
Nellie	Nine
Laura	What happened when you weighed your potato?
Nellie	The scales moved a little bit.
Laura	Thank you for the interview Nellie
Nellie	Thank you very much Laura.

Note: Laura and Nellie, Preparatory

Researcher notes taken leading up to the maths interviews show that initial explorations using podcasting for maths involved children recording explanations for mathematical concepts as a precursor to the maths interview. In these maths voice recordings podcasting was used at point of need for the child throughout the process and the focus on literacy was implicit, rather than explicitly noted:

The children have been exploring their mathematical understandings using podcasting software. The process has interwoven literacy and maths. The children are using ICT to demonstrate understanding of maths topic. The podcasting procedure involves the children in articulating their mathematical understanding using visual and aural presentations. These podcasts are more than reflection and more than recording the answer. They seem to be a way of showing understanding of the mathematical concept entwined with literacy. For one child this means podcasting an aural explanation first. For another child the explanation needed to be written first then recorded. For another child the visual representation was needed in order to prepare the written and aural explanation. (Researcher Journal)

Mollie outlined one final critical incident in her LSJ before closing her story for the year. This incident involved a parent helper who did not feel confident in using the Macintosh notebook computers. The children in Mollie's class came to her aid and helped her to learn how to use the computer and the program they were using:

One day when using the assistance of a parent helper, the students were recording a December reading of their favourite book. I kept looking at the students she was working with...because this mum was a little hesitant with the use of computers, and having never used our laptops before, correctly saved all the recordings. Every time I listened, they were explaining to her what to call the podcast and where to put it. This was individual students on their own with her, and each one of them had taught her something new on the computers. It also made her a little less hesitant to come back and be of assistance next time! (Mollie LSJ2, p. 13)

In her final interview Mollie provided a more detailed recount of the incident:

...yesterday I was trying to get a few things finished and we had a parent helper [Jessie] come in and she was just walking around because we were just doing a reflection on a book response - our favourite book for the term. Then we were recording our voices and they [the children] were recording what the story was; the title, the author, what the story was about and their favourite part, and then just a bit of reading their favourite part. They had to complete the planning sheet before they could record it. Anyway, her son Cameron had a small tantrum and he wasn't going to be doing it so we said, *'Do you mind just going over and working with him?'* She's a bit nervous getting onto the computers but anyway she said, *'Okay, I'll just take over from what you're doing here.'* Jessie just kept on going working with the group of children, but she kept going because the children around her were showing her, and every single one was saved in the right place, in the right folder, every single one because the children were saying, *'So you know you've got to type in December reading and what it's called and then you've got to save it into the server and students and in our folder,'* and she had never used it [MAC computer] before, but the children, I kept looking across and the children kept saying, *'You've got to do this Jessie and you've got to do that'.* (Mollie F5, p. 6)

For Mollie, it was the children assisting the parent helper to improve her confidence in using technology that was significant and she noted: "She [Jessie] was quite happy then because she thought if Preps are doing this and they're showing me how to do it then I can do this again next time, which is

good” (Mollie F5, p. 7). In her final interview Mollie noted that the children helped each other learn, not only in this incident, but on a regular basis and ‘technical experts’ among the children began to emerge:

‘Okay, if I don’t know where to save to who can I ask?’ ‘If Mollie is busy with someone else and there’s people around me who can I ask that knows how to do it?’ Often that would be something, if children would come up to me and there were problems like that, and they tried to figure it out and they didn’t know, I’d assign children rather than me coming over to do it. So ‘Who can help Benjamin with saving?’ or something like that, using the children as the experts rather than just me having to go to everything too, which is good. (Mollie F5, p. 10)

5.5 Mollie’s Final Reflections

In her final interview Mollie reflected on some of the key aspects of her experience and the learning experiences of the children throughout the term. Mollie believed that the variety of projects that children had been involved in through ‘Learning on the go’ had fostered independence among the children:

Particularly the extended projects that they’ve been really working towards rather than lots of little things, and the *Learning on the Go* has really helped the children's independence because they really enjoy being able to do, knowing what things need to be done, but they can really work at it... unless you get right to the end and you’re under the pump to get things done. They can work at it when they want to do their hand writing when they want to, they knows that needs to be done. They can go and do some reading if they want to. (Mollie F5, p. 9)

Of significance to Mollie was the independence fostered through providing the children with choice of activity as this process seemed to encourage the children to learn from their mistakes:

That’s been really important to give them the independence and not always be me and the same particularly with the computers as well, to give them the freedom to be able to just go and do what they want to do and have the confidence in them to be able to save it correctly and learn from their mistakes. (Mollie F5, p. 10)

In her LSJ Mollie highlighted the independent way in which the children now use the notebook computers. She noted that whilst at times it was frustrating during the initial stages when children lost their saved work and took longer than expected to complete tasks it was a necessary part of the learning process that contributed to their independence: “It was amazing to see the continued independence on the computers. The students could use programs on their own, and ensure it was saved (although sometimes where too I’m not sure!)” (Mollie LSJ2, p. 12). For Mollie any mistakes were part of the learning and decreased over time just as children learned to support each other with the technical aspects of using the notebook computers:

...it was good to see their continued independence on the computers and how they could just use a lot of the things on their own and look to the people beside them for help. That was even improved from last term. And to make sure it was saved the title was usually right, often the place just could be anywhere. (Mollie F5, p. 6)

Mollie provided two examples to illustrate student independence using technology. In the first example Mollie referred to the way in which the children created regular reading school based podcasts in order to gain feedback and to keep a record of their oral reading over time. Mollie believed the process of podcasting readings enhanced the children's reading development rather than becoming the emphasis of the learning, and could be done without the assistance of a teacher:

It really is using it [technology] to enhance what they are doing which is good. That was the same even with just their reading and all that sort of stuff. They don't orally read ['round robin' reading] now it's just, '*Can you go and get a computer and podcast your reading?*' '*No worries,*' and they podcast their reading. (Mollie F5, p. 18)

In the second example Mollie referred to a young child in the classroom who had moved from avoiding using the notebook computer at the beginning of the year to becoming a leader in the classroom when others required assistance with technology:

I've been, particularly this term, impressed with Jessie's independence because she, at the start of the year, was absolutely petrified; cried the first time she used the computer and now shows the other children what to do and corrects them when they're not doing the right thing... (Mollie F5, p. 8)

When asked to contemplate what strengths of her program she valued and would like to implement take the following year Mollie described her desire to continue to foster independence in learning with technology. She believed that in the following year, with the new Preparatory children, she would have the advantage of having some children who are already familiar with the way that technology is used in the classroom and who could be models for the new Preparatory children:

...the independence, and it mightn't take that long next year because I've got good modelling, well hopefully have good modelling from the grade ones next door and the grade twos; so working towards that again, that independence. (Mollie F5, p. 11)

It seemed almost as if a mutually beneficial relationship between literacy and technology, or the continued infusion of technology in the literacy context was taken for granted.

In her reflections on the second cycle Mollie noted that the children seemed to demonstrate a strong interest in writing:

...it's funny though because some of them, I don't know, in a normal, I suppose in a normal Prep classroom there's a lot of, or I'm familiar with a lot of '*On the weekend I...*' and that sort of stuff but these children this term, I've really noticed the last couple of weeks compared to the first couple of weeks that we had of the term, how much their writing has started to take off and how independent they are at having a go. (Mollie C4, p. 5)

This interest in writing had even extended to practicing spelling strategies as Mollie described the disappointment of one child who wanted to employ a spell checking strategy she had learned but was unable to:

Ashley was wanting to double check how to spell 'have' and because we've been doing so many different things where they've got to access the words and whatever else, she loves to use the Magic Words, and Pete said, *'Oh, we're not going to worry about the spelling, we're just doing this in a hurry you know, it's just a five minute activity,'* and she's like, *'Oh,'* because it was like he had just taken away her strategy that she was using, and a lot of them are just producing so many things and being able to hear so many sounds but I've taken away the constant activities that require them to think that. It's just because they're doing that all the time... (Mollie C4, p. 5)

Mollie believed the children's interest in writing had been encouraged through the highly motivating activities the children had been involved in throughout the term. She noted that the learning activity centres that were common in the two hour literacy blocks at other schools were no longer occurring in her classroom and yet the children wanted to learn and to write:

...you often have learning centres where you're doing alphabet things here; you're doing something else on the alphabet here, and whatever else. The only alphabet stuff that they learn is if they *need* it, they haven't done that for ages, it's the listening to the sound waves on the I-Touch's, and following along what the sounds are if they are starting to struggle and focusing on different ones. But I haven't done that this term, but they've really decided to, I don't know why. I think it's because they actually want to write about what they're doing because it's got some sort of purpose, I guess, rather than doing the same thing over and over. I don't know, I have just noticed that they're really started to take off a bit more this term than they had, which is good. (MollieC4, p. 5)

Whilst some of Mollie's observations may be attributed to behaviours that would be expected to be observed in Preparatory children during the final term of the school year it is the high level of motivation and purposeful learning amongst the children that Mollie believes can be attributed to the learning experiences they have been involved in with technology in the literacy context.

Mollie could not see a purpose in using literacy activity centres in a two hour literacy block anymore because she believed the children would not maintain interest in learning because the activities in the literacy block usually lacked authentic purpose:

...and I think the children would struggle [with rotations in two hour literacy block]. The children would get bored with the centres and because they can concentrate, well some of them you know will start to struggle around 10.30 – 10.45 but they, they would find it hard. A lot of them I know would be hating to just sitting there doing a game for 15 minutes and then something else because they couldn't see a purpose in it. Some of them they probably couldn't see why they were doing things. I know a lot of the things that you can do in a literacy block, particularly the reading activities ...are, *'You know, I'm trying to find activities for this group what can I do?'* (Mollie C4, p. 14)

Through the implementation of an integrated literacy block Mollie believed she was able to incorporate a range of activities that promote learning and could run across several days whilst maintaining child interest throughout the process:

...I think the painting of the pictures helped too because that helped break it [process] up. So they'd write a day or two days and then they'd be able to go out and paint and do something different ... It also helped with so many things, like we made sure when I was setting up the paints that they were the portrait ones so that they were up high,

so they were having to have that control and only using the small brushes and all that sort of stuff. That was good to be able to use [pause] and they just thought that they were just having a bit of fun out there but they were learning too. (Mollie F5, p. 14)

Mollie believed that the program she was offering the children was rigorous but it gave the children some choice in the pathway taken to reach the learning outcome:

...in this one [classroom] they know what they're doing and why they're doing it, and they have the choice over what they're doing. So being told what to do rather than just being told you're in a workshop is different. (Mollie C4, p. 14)

Mollie's reflection was in reference to Learning on the Go (LOG) where children are given some choice over when they complete set tasks during the course of the week and how long they spend on these tasks. Mollie noted that the children were aware of her expectations for task completion and associated time frames but the program still maintained autonomy.

Mollie described the way in which she views the integration of technology into the program from a pedagogical perspective: "...it's not so much, '*What can we do with technology?*' It's just, '*What are we doing and how can it help us?*'" (Mollie C4, p. 13). For Mollie integrating technology and literacy was about 'process' rather than 'product'; "just the publishing, the typing up of the story" (Mollie F5, p. 12):

I think the little book that they have finished with has been through a lot of stages to get it to that point, and that's what's been really nice about it, because even with the technology it's been used for so many different purposes hasn't it? For the same thing but in so many different ways. (Mollie F5, p. 7)

In the initial stages of the study Mollie admitted that her use of technology "was very forced" (Mollie F5, p. 11) but Mollie articulated at the end of the second action-reflection cycle that she had experienced a change in her thinking and practice:

...now that I think about it [Mollie's thinking] and reflect on it; thinking about the things that we did in term one and term two it has been a change... When you were initially here it was Pam and I. We were like, '*What can we do for Kate? What should we be doing?*' But now [pause] I didn't even think about what I was doing [pause] I just report on what we have done. (Mollie F5, p. 12)

I don't even think of it [technology] too much now. It's just become a part of what we do. I don't even think, '*Am I using technology or not?*' because it is just something that we do and I don't think the children think of it. (Mollie F5, p. 12)

In her final reflections Mollie described a seamless integration of technology and literacy in her classroom in the following reflection:

I don't even think of it [technology] and the only reason that I'd noticed it [technology] was I looked at all the literacy things that we'd done this term and I thought, '*Goodness, I've got a lot of podcasts and a lot of things that have used the computers,*' but didn't really realise. And I thought, '*and there's more things that I could put on [USB sticks],*' but didn't because there's just so much. The projects that we did, there were just so much and we've used them, we used technology several times throughout the process. After they planned they were sharing and that was

recorded, and then they listened to themselves and thought, '*Right, I can make this story better?*' and then we used it even for the scanned pictures to make a better quality; to publish their narratives. Just lots of use, you don't even realise you're doing it. (Mollie F5, p. 11)

These reflections ways showed Mollie's effort to apply technology to the literacy context in ways referred to by Johnson et al (2009) as flexible and customisable to suit the learning needs of the children.

For Mollie, her pedagogy for the use of technology was not necessarily planned. Mollie noted that the application of technology to the literacy context was more closely related to what the children were doing and how they were immersed in it:

And sometimes it's quite often; it's not as planned thing. Like I knew that I wanted them to record their voice always, and want to have that and the

e-book, but the rest of it I didn't really think too much about how I was going to do it. It sort of depended on where the children were at and what was going on. The recording of their voices for the sharing was just a pure spur of the moment thing. It was a just, '*Okay let's use it, we know we can,*' also, we haven't done it as much in the last few weeks because there's been a lot of finishing off, but the recording of the tasks of what they should be doing as well, like it's just all taking away me and allowing the children to be immersed in it as well. (Mollie F5, p. 12)

An example provided by Mollie highlighted the way in which she believed young children can learn using technology:

I was watching little Tracey who's just new and she knew her way around the laptop and was quite comfortable. They don't have a laptop at home but she was quite comfortable working by herself dragging the photos and that. It's not something you even had to teach her, the programs that we use, you weren't teaching her and even if she did know the programs; I know that she said that she hadn't used a Mac before, she said, '*The red thing's always on the other side,*' and I thought, '*Well obviously she's got a PC, she's found it,*' and I thought that was really interesting. So it doesn't matter what computers they use the children pick it up really quickly. (Mollie C3, p. 3)

Mollie believed the integration of technology into the literacy program had helped to motivate some children, particularly a group of boys, to engage in learning:

...it's been good for them to be able to listen back [to their recordings]. It's been so funny. The boys particularly, as soon as they're finished recording, '*Can I listen to it, can I listen to it?*' You're like, '*Oh, alright just take it to another computer to listen to it; I'm busy now trying to use this one*'. (Mollie F5, p. 7)

Given that there were not enough Macintosh notebooks, I-Touches or other peripherals for all children to use at the same time the way in which Mollie provided access to the available technology was important. When asked about how she mediated student access to technology in her classroom Mollie acknowledged that shared communal access was important:

That's the best thing about having the laptops because you can still be here [in your classroom] and you can have groups of children working together, or you can be

having a conversation with the person next door while you're on the computer. Whereas on a computer, if you've got a big monitor there too and you're all in a lab, it's just something to hide behind. (Mollie F5, p. 18)

Mollie believed that when the children used the technology, particularly the Macintosh Notebook computers, they cooperated with each other and shared the technology with a minimum of fuss:

...they [Preparatory children] are so good with it because quite often it'll be the seniors [years 1 to 6 children] that'll get them [notebooks computers] first because we'll have shared reading. They'll get their computers first and I'll just go in there and say, *'Whoever's finished, when you're finished can you just bring it in?'* And they'll say, *'I'm nearly finished, I'll bring it in. I can do this later,'* or whatever else, and they're so good. Same as the Preps; they'll do the same thing if they realise that someone else needs a computer. They'll just think, *'Alright I can do this later.'* (Mollie F5, p. 63)

Mollie attributed some of the cooperative behaviour that the children displayed to the organisation structure of the literacy session:

I suppose that comes from the 'learning on the go'; 'I've got other things I can do.' It's not, 'This is my time; I need to do this now.' 'It's alright. These are everybody's computers. We've all got things we need to get done'. (Mollie F5, p. 18)

Connected to the communal access to the technology that Mollie described above, was the way the children and Mollie worked together to learn with the technology:

...I couldn't care less if the children are telling me I'm doing the wrong thing. I don't care. We're all learning how to use the computers together so if the children can show me something that they've learned and I didn't know I'll soon tell them. I don't care, and a lot of people are afraid that the children are going to know more than they do, but good on the children if they can develop their skills. If we're providing them an interest for them to try and develop their skills, well good on them for being able to do that. (Mollie F5, p. 19)

The experience of learning together extended beyond the classroom and across the school.

Mollie noted: "Pete and I have sort of been on the journey together so we're sort of at the same stage" (Mollie F5, p. 13). When the pre-service teacher entered the context at the beginning of the second cycle Mollie realised the extent of the learning that had occurred in the collaborative environment: "to have somebody [pre-service teacher] that was back a step you didn't even realise that you'd come that far too" (Mollie, F5, p. 20). Mollie observed that the pre-service teacher learned about the technology from the children: "she [pre-service teacher] would have learned a lot from the children because they explained a fair bit, just like with Jesse [parent helper] the other day. They showed her how to do a lot of stuff" (Mollie F5, p. 21) and researcher notes taken on an observational visit supported Mollie's observations and noted that the pre-service teacher was embracing technology in the classroom:

The pre-service teacher appears to be very comfortable with the classroom program and seems to be working well in this learning environment. The pre-service teacher is using technology with the children in a similar way to Mollie and she is encouraging collaboration with technology in the learning community. Children seem to be working independently with the technology and are seeking help from each other when they need it. The pre-service teacher sought help from the children with

managing Garage Band as they were podcasting the school stories. The children showed her how to pause and delete sections of the recording. (Researcher Journal)

Mollie shared a reflection from the pre-service teacher in the final interview that showed the extent of the pre-service teacher's enthusiasm for what she had been involved in at the school:

She [pre-service teacher] commented to us, because we asked her what she'd learnt from it [her experience at the school] and what she would take away. She did say, just realising how much...literacy can be implemented into things you're doing every day. So, she said, *'First thing I'm going to check out, when I get a job is how many computers they've got, what the capabilities are, whether or not we can put on Photo Story or something like that,'* and I said, *'Oh that's good'.* (Mollie F5, p. 14)

In her final reflections Mollie identified key elements of the learning journey as they related to her experiences. In particular, Mollie noted the way in which her own learning had developed alongside the children's and the subsequent benefits for all participants:

It's [the study] just part of what we're doing now and it's been really good for our growth and understanding, and to help bring the children with us too - because the children have all been part of it and have been helping to drive a lot of the things that we're doing as well. So a lot of their questions and all that sort of thing have been driving where we've been going. It's been good and it's been bringing the children together too, like we've sort of been on the same journey. It's been good. (Mollie F5, p. 14)

As identified above, Mollie noted that her participation in the study had deepened her understanding of how to integrate literacy and technology. Mollie acknowledged: "at the start it [participation in research study] sort of encouraged me to do a lot more with the use of technology and now I don't even think about it. It's just so, it's really helped with my growth as a literacy/technology teacher" (Mollie F5, p. 14). In her reflections Mollie also identified an improvement in her technological competence using Macintosh computers:

Technology, I'm sort of starting to get my head around a fair bit now, it's just a matter of I guess, because I'd never used a Mac before. It's funny how my shift has changed now too, because I'd never even thought about Mac's because I'd never had them around. I'd never had the opportunity, I'd never seen anybody that had one, never seen anyone that did anything on Mac's and then when I got one here I thought, *'Oh great, good opportunity,'* and now I don't use my PC at home. I don't use it - I've got a laptop and Ben's the only one who uses it. (Mollie F5, p. 10)

For Mollie, learning how to use the Macintosh computers was about having opportunity and willingness to explore using the technology. Her reflection indicated that the support of the researcher and through opportunity to explore the technology with the children, she was stimulated to try different things with technology and to extend the integration of technology beyond the literacy program and across the curriculum:

It's just a matter of playing, and the more that we've done with the podcasting and that, the more we can see what a lot of other opportunities there are with what we've got. Other than 'I-Movie', we've sort of got a handle on podcasting, got a handle on how to use 'PAGES' and stuff like that. I guess it's just what other things, what other opportunities there are for us to use the technology. So we've been talking about what

opportunities there are for maths and just other things with the literacy as well. So I liked when you were showing us about the movies so that sort of stuff as well. Which is like a *developed podcast*, and the children have been, well I know the senior children have been, putting in the music in the background. So I know there is still a lot more in Garage Band that we can do. (Mollie F5, p. 16)

In terms of further professional development extending from this study Mollie articulated a need to continue to build upon her existing learning: “it would be trying to continue to extend, now that I am comfortable - well get me outside that comfort zone again to learn something new” (Mollie F5, p. 16). The extension of learning mentioned by Mollie was not in reference to moving from one piece of technology to another, or from one program to another but rather about pushing the boundaries of what both she and the children are familiar with:

...it is probably not a good thing to be in the comfort zone because if you're not learning anything well the children aren't going to be learning too much either. They're not going to be developing their skills if you've got nothing more that you can help them with on the computers. Well I just guess it's just that I want to keep seeing what opportunities are out there and what are the things you can do because we've been doing a lot of podcasting, the children are becoming very comfortable with it so you want to see what other things you can do with it now. (Mollie F5, p. 16)

She noted her participation in the professional learning intervention and the process she had been through in creating a LSJ had been beneficial to learning. She particularly found the process of reflection useful and described using the experience of action-reflection cycle one to inform action-reflection cycle two:

...the ideas of where to go and understanding what's happening in it too...The one [LSJ] last term helped with this term. There was too much happening so I thought, ‘*Okay, we need to take a step back*’. So a big focus for the term was...the big narrative [School narrative] and the narrative was based on across the road [new school construction] so it was good. (Mollie F5, p. 14)

Mollie's aspirations for her program in the following year included the incorporation of *digital language experience* into her program at the beginning of the year and to implement a ‘buddy’ system to accelerate the Preparatory children's learning and ‘Learning on the go’ in a moderated format:

...continue to use a lot of the language experience at the start of the year and use the computers as a tool for this. Continue to enforce regularly how to save properly so that is really good skill that they've got. Using I'd really like to try and use the grade ones next year as buddies too for a lot of things. So we were thinking at the start of the year to try and get them [new Preparatory children] to do their life story again, like the Preps did at the start of this year. So using the ‘Ones’ [grade one children] as the ‘experts’ as well; to be doing a lot of the buddying up. What else? ‘Learning on the go’, but it would have to be a modified one in terms of the children choosing what they're going to be doing. I wouldn't like to go back to the task centres. (Mollie F5, p. 10)

This reflection indicates that Mollie had come to the realisation that when technology was applied to the literacy context in ways that fostered rich social interactions literacy learning occurred. She indicated that she intended to continue to apply elements of her current approach in the following year

to continue this process. Pete expressed similar feelings of enthusiasm for the journey that both he and Mollie had been on, and his final reflections are described in the following section.

5.6 Pete's Final Reflections

In the final interview Pete reflected on the infusion of technology into literacy across the school from both a teacher and a principal's perspective. He began the interview by sharing a story which highlighted how far he had come on this journey:

I was driving home from Melbourne on Sunday and I was thinking about Kevin, because Kevin's Dad has just graduated from the Police Force, so on Friday we knew that was happening. So I asked him would like to borrow one of our digital cameras, take it with you, get a whole lot of photos and you can use them and create a musical slide show for dad and we could use it for a Christmas present, or something like that, just of his graduation day. And he was stoked. So off he goes and he took it and we did that. (Pete F2a, p. 1)

For Pete, technology provided affordances to take learning beyond the classroom walls. Authentic context and meaningful experiences remained key drivers but Pete was now describing a learning community extending beyond the classroom. This was something that he was eager to explore further:

That discussion we had earlier with about little Kevin and the photos of his Dad's graduation in the Police Force, you know that just highlighted for me the importance of having children use them. These digital cameras will sit in the cupboard all weekend. Why aren't we booking them out? ... I believe it's in the conversations and having some sort of negotiated and collective vision for a newspaper and sharing of discoveries and journaling all that. Just saying to children, 'We've got 4 -6 really good cameras and Karen [researcher]you're really interested in learning about bird life take the camera home and you can have it for the weekend.' (Pete F2b, p. 4)

...so you're interested in multi-culturalism and you go down and you take photos of Boonerang, down the street, or you happen to go to Melbourne on the weekend and you go through the Footscray Market or whatever it might be. It's quite overwhelming in many ways, what's possible when you genuinely negotiate, but bringing it back to say we're doing this because we're authors of the future of this school and we're going to do this so that we can deliberately structure ourselves and have a really common and a great shared vision together so that this school in twenty years' time will be right out there. I think it's a really exciting prospect. (Pete F2b, p. 4)

Within the classroom context Pete was also beginning to see the benefits of working together collaboratively in a learning community could mean more than supporting each other with technology and working towards collaboration in all aspects of the learning process:

...I was driving home thinking in terms of the newspapers and what we're doing and one of our key aspirations is to build this culture of 'we' rather than 'me' and particularly in the context of a new school and with all these children coming from all these different schools, 'Why are we doing individual newspapers?' 'Why wouldn't you have a newspaper with kids feeding articles in?' (Pete F2a, p. 1)

Pete's vision for the seamless integration of literacy and technology involved a high level of student control over the learning process and his vision for the continued exploration extended into the following school year:

...what we're going to do now is start negotiating with children and say, '*Find an area of interest*'. '*You can publish and article on an area of interest*'. So for Tim it will always be dinosaurs - okay that's fine. But then also this is our core focus, this is what we want to look at in terms of our collective vision... at the start of next year we will be looking at the Indigenous history and culture of our land onto which we are building; and truly, you know, really trying to get some understandings there. And so there will be an expectation to that you actually create and present information that's aligned with what we're doing collectively... The Podcasting then has more of a shared vision because it's feeding into something that we all own. So we will create not just Kate's newspaper and Pete's newspaper podcast but or 'news report' we called it. It will be, '*We are all reporters on the same network*' if you like. (Pete F2a, p. 1)

Pete described this shift in his understanding of the relationship between literacy and technology as moving from seeing the purpose of technology as a vehicle for curriculum learning to seeing technology as a vehicle for change:

I've looked at the Podkids website extensively but it didn't click in my mind at the time. I could see the potential for podcasting not the potential for using podcasting as a mechanism and this technological platform as a mechanism to actually help enhance the culture of the place. Now that's a bigger step. (Pete F2a, p. 2)

In the example, provided by Pete, he noted that initially he perceived technology as a vehicle for individual learning but now better understood the potential that technology generated within a learning community. He also articulated a desire to continue to go deep in the learning for staff and children using one form of technology rather than moving from one technology entity or program to another. In particular, he wanted to take their inquiry with podcasting further, as he believed that there was more to learn:

...we were feeling pressured to do something different rather than refine the podcast process even further. I think we're still barely scratching the surface on podcasting and use of Garage Band. (Pete F2b, p. 4)

In terms of literacy learning Pete believed that the opportunity to explore podcasting with the children had provided significant gains in oral language learning:

One of the other interesting things has been the overall improvement in the children's' oral language. The podcasts now are a quantum move from where they were at the start of the year. I suppose it's been a bit hard to gauge; for the children who started, the 21 who started, that's an easy one to measure, for those that have come in mid-year and the latter part of the year, that's more complicated. But what it continually highlights for us is the need for us to be really focusing, on particularly a fairly strong cohort of little boys whose oral language is poor consequently their read language – you know their interpretation of text on a page is poor and their written language is poor. So we've got to continue to work on this oral language. We've got to scaffold them through oral language and convince them and it's the same group of boys that we have been talking about. At least I think we're getting the structures close to right. (Pete F2a, p. 3)

Given time to reflect on the many learning experiences with podcasting the children had engaged in Pete believed that the affordances of podcasting for literacy learning were linked to oral language:

So much of what we've done with literacy has always started around reading and writing. The Macs give us an opportunity to really start with oral language and make it really exciting to use that oral language and to use it to facilitate reading and writing that's meaningful to children. (Pete F2b, p. 7)

In addition, Pete believed that podcasting as an oral language platform presented possibilities across other areas of the curriculum. In particular, Pete saw potential benefits in using podcasting as an oral language platform for children to demonstrate mathematical learning and he articulated this point of view through his recount of a discussion with a visiting mathematics curriculum advisor:

It's interesting we had Cara from the Office out here not long ago and we were talking about how to use the Macs and the like and she kept saying we need to have this problem solving approach and I said, 'Yes Cara, that's true but if I present a problem to Tim and it's a problem that's 5 or 6 lines long in terms of its explanation, I've lost him. Yet at the same time, I know he is very switched on mathematically.' So we're not assessing his mathematical competence were assessing his comprehension. If I could present that problem to him orally then I've got a legitimate assessment that's taking place. (Pete F2b, p. 9)

Extending on this statement Pete noted a concern for continuing problem solving worksheet assessment tasks in mathematics where a child's ability to show mathematical understanding may be impeded by their ability to read the problem:

Collect fifty schools' learning portfolios today or in the next few days that have come home at the end of the year, and have a look at the maths assessments. I will guarantee you that ninety five per cent of them will be worksheets. And very often so they're sum based or they're going to be literacy based with a long winded sort of problem. (Pete F2b, p. 9)

Problem based worksheets, Pete believed, did not provide an authentic context for all children to demonstrate learning.

In the final interview Pete expressed the point of view that technology, in many instances, provides an authentic context and platform for learning. One story of the way in which podcasting had been used in an authentic context as the platform to improve literacy was provided in the interview:

To even hear Riley, as much as we were joking this afternoon at assembly, publicly he is barely audible. You should hear his podcast of when he was a news reporter. It's fantastic, fantastic! He did a really, really good job. Well he sat with his head phones on away from everyone and he did a really good job. I said to him that, 'You've got to be Peter Hinchener or whoever it might be'. 'You've got to be that news reader and you've got to present this' and he did a really, really good job. That oral language kick off point will be enormously helpful to him. (Pete F2b, p. 5)

For Pete, what was evident from using podcasting for literacy learning was that the children needed time to explore the technology first and then deep learning followed. In the example described above Riley became competent with the program before the learning episode occurred:

You know the first week or two they were sort of hung up on, 'Am I pushing the button correctly?' but then very quickly it just became second nature and they've become incredibly proficient and confident. (Pete F2b, p. 6)

Pete also noted that through observing children record school based podcasts and listening to their school based podcasts he was able to learn more about their literacy practices. He provided an example of a young girl who tended to waffle in her school based podcasts and get ‘tongue tied’ during the composing process of writing:

Erin as much as her end product has come up really well, what we’ve noted of late is she’s really verbose. She gets tongue tied and what’s she not doing is clearly formulating her ideas in her head in that thinking phase of being an author, before she’s either articulating or writing, and even actually her last newspaper in an attempt to be funny and perhaps even have the longest paper it really waffles. So it’s there, just interesting little characteristics that you can within children’s work; reading, writing, spoken language that you can really hone in on and I think we are far more attuned to it. (Pete F2b, p. 5)

Of particular interest to Pete, in the example he provided, was the affordances of podcasting to be used for children to self-check or conference their own work:

Listening to Emily; it’s interesting often times what she is saying is not what’s on paper because she knows that ‘I can’t say that because it doesn’t make sense’ and yet I’ve written it in nonsensically. (Pete F2b, p. 7)

Shane in one of his reflections which he recorded, this was it’d be last term I think, he actually made the comment about *‘what I’d written and what I recorded were two different things’* and he used almost what I’ve just said to you verbatim ‘that I couldn’t record what I’d written cause it didn’t make sense’ and he used that as a learning. The other thing that strikes me is I don’t think that within the process of writing when we do a buddied conference I don’t think I’ve ever seen children really doing that well. But Garage Band lends itself to a conference perfectly, because if you were asked to literally, and word for word, literally, read what you have written and then listen to it back, then I think that’s the most effective conference you’ll ever have. I rarely have ever seen children, since the writing process been around, conferencing with children done really effectively. Like when you’ve got two children engaged on that one piece of text really looking at it, really discussing it, really pulling it apart. It doesn’t happen and if it does it happens whimsically. It’s not consistent. (Pete F2b, p. 8)

Pete was eager to further explore the affordances of technology to provide authentic learning experiences. He referred to inspiration provided from a podcasting website he had been using:

...reflecting back on PodKids that’s a great website. To see little groups of children interviewing the Premier of their State and to have gone through the extensive and exhaustive process of researching who their Premier is, what are the issues, what do we want to ask him and all those sorts of things. (Pete F2b, p. 10)

Pete aimed to use this inspiration as a springboard for further investigations across the school community:

We [all staff] want to start next year having a focus on the Indigenous story of the land. So let’s interview some of the local elders or whoever it might be. The builder, A.T. is building our school. Let’s interview our builder, find out you know what’s going on, how’s it going? When does he anticipate it will be finished? How long has he been a builder? Where do you start? How do you know how much is going to cost to build a school? and all those sorts of questions. (Pete F2b, p. 10)

In the following year he hoped that the school community would continue to improve teaching and learning using technology in authentic and meaningful contexts.

Pete noted that future directions with technology in the school would involve continuing to build on the current philosophical base. In particular this view centred on technology being a tool to personalise learning (Pete F2b). Pete commented that the school population had increased throughout the year but the number of notebook computers had remained the same and although there were not enough computers for every child access to the technology when required had not been an issue. Pete expressed that the issue of collaboration using technology was something that he wanted to explore further:

I'm trying to think of this short term and long term. It's not desirable in fact it is probably is counter cultural to what we are trying to do to have 100 computers or some ridiculous number of laptops, or a laptop per pupil. (Pete F2b, p. 1)

I suppose the philosophy is more centred on using the technology as a tool to personalise learning. Now you can have builders on site, not all of them need a hammer at the same time but they will need access to them regularly. And so I suppose everyone keeps saying, 'How many interactive white boards are you going to have?' and I keep my answer to that is that 'I would probably prefer to have three laptops or 3 and a bit laptops for the one interactive white board that I could be using'. ...it is not desirable to have too many we know it is not desirable not to have not enough. (Pete F2b, p. 1)

Pete was eager to ensure that as the staff and student population at the school continues to grow the way in which technology is used remains integrated and collaborative:

One of the things that we're finding, is we've tended to find, and on reflection in what we've done with our learning portfolios, that we've tended to say we can't necessarily put the work in the learning portfolios because we've always clustered it RE, English, Maths, Inquiry English Inquiry, Phys Ed [physical education] and we've clustered it in learning areas. What we're actually thinking, and Mollie and I were talking about this last night, and what we're thinking we'll do now is do it in chronology, so no matter what the learning area we'll put it in at the time that it is occurring so that the parents actually see, 'Oh that's the start of the term, that's the end of the term'. So it could go from Maths to RE [religious education] to English Inquiry back to RE but that's the way that it has gone in. I reckon in doing that we could take the heat off the need, the necessity to have all those computers on the go as frenetically as what we were. (Pete F2b, p. 2)

He noted that as the school population grows there may be a need to take the time to learn together and to ensure that staff members who are newly appointed share a similar vision:

Thus the importance of appointing people who come in with open minds, similarly it's equally as important that we don't rush you know that we just keep saying 'okay' and 'it's going to be hard'; probably hardest for Mollie because there's going to be times when she's ready to run and we've just got to put a rein on it a bit to say, 'Hang on, where are we at collectively in our vision and our understanding of this?' because if we got one teacher way out there with her children and one way back here all we end up effectively doing is creating comparisons. (Pete F2b, p. 2)

Time to learn and explore with the technology together was something that Pete valued and he felt cautioned against being pressured into trying to learn too many things too quickly:

GT would come in and he was pretty strong on I-Movie and Mollie and I just couldn't quite get our heads around I-Movie and still haven't because we haven't really gone into it properly. TS from Sydney, from Apple, was big on making sure we had created a dot mac account so that we could be having the children uploading their digital portfolio onto a website that parents can access. All that stuff is aspirational and it's possible, but it was too big for where we are now. (Pete F2b, p. 5)

In fact for Pete the learning process he had been through highlighted the need for professional learning opportunities with a pedagogical focus:

...there are plenty of Mac gurus there but there's not many people who've got a really strong primary learning and teaching background with Mac and that's a real deficiency with their organisation (Pete F2b, p. 5)

As the interview drew to a close Pete reiterated his belief that children learn through engagement and that this will continue to be the focus of teaching and learning pedagogy in the school:

...just the continued engagement of those little boys and again just watching the dynamics change next year when new children come in because they change with the wind. (Pete F2b, p. 12)

In the following section two child vignettes are described. The learning behaviours of these children have been described because their learning throughout the study was of particular interest to Mollie as they were children who were at times, for quite different reasons, difficult to engage in literacy learning. Mollie's mediation of technology and the way these children responded to that mediation may further inform understanding of a symbiotic relationship between literacy and technology in the early years classroom.

5.7 Vignette: Don, the Reluctant Writer

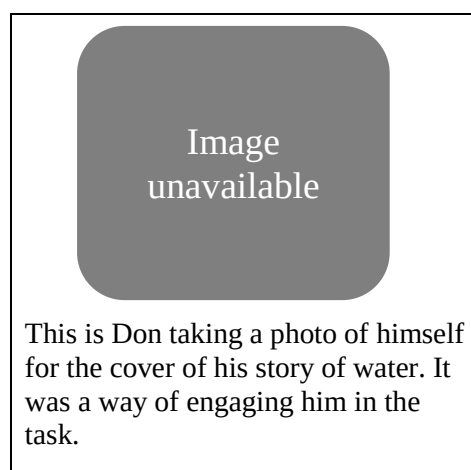
Don was a Preparatory child who was a reluctant writer (Mollie F5) but Mollie realised early in the study that he loved "anything to do with the computer" (Mollie C4, p. 3). Mollie hoped to engage Don in literacy learning through the use of the computer to create an e-book:

...it [making an e-book] was a good way of engaging him [Don] with the task as well is to get them to take a photo of themselves and print it off to have it as a front cover and then for that one they had to match the title, so it was 'The Story of Water' and it would be by Don... (Mollie C4, p. 3)

When Mollie modified the activity to enable all students to complete the task successfully, Don particularly enjoyed the opportunity to use 'Photo Booth' to take a photograph of himself and use it for the front cover of his book. Figure 5.29 shows an excerpt from Mollie's LSJ where Don's engagement is described.

FIGURE 5.29

Excerpt from Mollie's LSJ1



As the cycle progressed Mollie observed that Don became an 'expert' at using the programs on the computer and assisted other children with the technology: "Anytime anyone has got a computer he [Don] is like, '*Do you want me to help with this?*' whereas normally he's the one who sits back and other people write for him or whatever else" (Mollie C4, p. 3). Usually when it comes to sequencing text; an important early literacy skill, Mollie observed that Don found the task difficult. Some of the learning activities that the children had been involved in with technology were sequencing activities and Mollie found that the incorporation of technology helped to engage Don in a task that he would have otherwise avoided:

Well it gives them, particularly the lower ones, it's given them some sort of way of having some sort of success as well, you know, like with the taking the photos and with engaging them. So, Don that normally would have in a sequencing activity responded with '*Oh gosh, no way can I concentrate,*' but you slip in a little bit of technology and it gets him that little bit further. He can all of the sudden see a purpose for it, '*Oh, okay now I've got my photo on the front, now I can go and match what these pictures are. I've taken those photos so I can use those and I will put some words to it*'. (Mollie C4, p. 6)

5.8 Vignette: John, Understanding the Child

At the time of the study John's mother was soon to have a baby. John had been an only child and was very excited about that he was soon to have a new brother or sister (Researcher Journal). Prior to the commencement of the study researcher notes taken on an observational visit note that John was slow to settle to his work during the literacy session:

John is working on writing activity for a project. John and Nellie are working but not really on task in reading and writing activity. John rocking in chair and Nellie and a friend rocking also. (Researcher Journal)

John wandered off to sharpen his pencil and organise his belongings. He was slow to get started on the next task. (Researcher Journal)

However, he seemed to show an interest in using the Macintosh notebook computers:

John had a go at setting up his podcast while Mollie worked with other children. John was very interested in the technology. He seemed to be playing with it as he worked.

Mollie took John through the steps required to create a podcast and then he worked on his own to create a podcast for his book reading. (Researcher Journal)

During the study the children created sustainability narrative text types school based podcasts (Section 5.4.1, Learning Episode 3). Mollie noted in her LSJ that John found it challenging to work with others on this activity and his partner chose the option of trying to fix some of his written mistakes without him noticing. This episode has been previously described in Figure 5.5. However, throughout the course of the study John's cooperation with others and independence with using the technology improved:

Mollie noted that some children and John is a good example, have demonstrated greater independence with the technology throughout the term and John has been working cooperatively with others using the technology. (Researcher Journal)

Mollie described John as initially being hesitant with using the computers but had demonstrated growth in independence:

They [the children] think, '*But hang on a minute if they can do it?*' So I've been doing a bit of making sure that everybody is up to date with everything as well. And seeing other people doing it and how easy it is they sort of think, '*Oh*'. Like John, and he was first fairly hesitant with a lot of the computer stuff, but today as much as he gets distracted all the time, he came and was doing his podcast of what's happening over the road by himself, and he'll have to analyze it tomorrow and listen and [pause] '*there's a photo of...*' and I could hear him over there and I'm thinking '*Ah we'll have to have a play.*' But anyway that's something that he will have to learn as well [matching the visual to the aural]. But he did that all himself and his first reaction is still, and quite often you just have to keep encouraging him, is still '*I don't know how to get there,*' because he doesn't listen, but then he did. (Mollie C4, p. 6)

John's developing confidence was evident when he showed Mollie how to find the battery on the notebook as this was something that Mollie did not know about and he was excited to show her something new:

...but it's not because they [the children] know how to do everything and the thing is they are so excited with it. They try to learn things themselves. John was showing me the other day, I was fascinated, on the back of the laptops if you press a button it shows you where your battery is, I didn't know that. (Mollie C4, p. 15)

For Mollie, the growth in independence she had seen in John was linked to his increasing competence with the technology and perceived purpose for the task:

...I asked him to come here by himself today and he opened it [podcast file] up and he was doing the recording and saving and everything else by himself because he needed to. Although if you're there he's more likely to go to you but if you move him away from you he can do more by himself, things that he didn't realise that he can do because he is so used to just going and asking an adult. He thinks, '*I'll never ask a*

child, no way, because I'm smarter than all the other children,' so for the independence ... (Mollie C4, p. 6)

Although Mollie perceived John as capable she believed that the same result would not have been achieved if it was a pen and paper activity:

...if you had of just given him a book to just write with he wouldn't have done that. As much as he is a really good writer he wouldn't have just sat there and written about what he was going to say before he said it. If you just give him the computer and have a go he's more likely to do that and produce better sentences because he's actually, I think he sometimes finds it hard to write the sentences down as much as he's got great spelling and he writes all these letters and they're simple short sentences, and so his vocabulary is much better and I think he realises what he can say and what he can do when he podcasts as well. (Mollie C4, p. 6)

For Mollie the challenge presented to her by this observation was to continue to use podcasting to assist John to improve his writing: "So we've just got to then relate that I suppose to his writing later on to get him, to try to and write some of the sentences that he comes up with," (Mollie C4, p. 7).

5.9 Summary

The research questions have been addressed in threads throughout Mollie's story. These threads will be discussed in detail in Chapter 6. This chapter has described what happened with Mollie's practice when the researcher watched, walked and worked with her to enhance her technology and literacy practices using a systematic intervention for professional learning.

In the first phase of the study Mollie began by describing literacy as communication and technology as a tool for paper based literacy learning. Her descriptions of classroom practices reflected a functional or prescriptive approach to literacy and technology. As the researcher walked with Mollie and worked with her to enhance her practices, holistic literacy and technology practices began to emerge.

As was the case with Susie, throughout the action-reflection process Mollie described learning episodes where aspects relating to children's learning were significant to her. Mollie reflected on the children's learning experiences using the Macintosh notebook computers and in particular the podcasting software, and through the intervention of the systematic process of professional learning changed her practice. Mollie noted in particular the affordances of the social features of technology for literacy learning and fostered learning with technology in collaborative communities whether or not the task was individual, paired or group. She also identified the importance of children having ownership over the *process* when technology is applied to the literacy context and this was closely associated with having clear expectations of children completing the *process* and the *product* themselves and thus contributing to providing an authentic learning experience. Mollie's reflections further indicated that over time the children developed independence not only using technology but in their learning behaviours.

Mollie's preoccupation with the teaching of paper based literacy skills dissipated when she began to recognise through the intervention that paper based literacies were embedded in the *process*. As the researcher worked with Mollie, she recognised over time, the affordances of the application of holistic technology and literacy approaches highlighting a mutually beneficial relationship between technology and literacy. Like Susie, Mollie found that deep literacy learning was observed when children were given time to engage with the one technology entity for an extended period of time. It seemed that children need an extended period of time to move beyond the novelty factor and then critical literacy and transforming literacy practices were observed.

In his leadership role Pete provides some further insight into influences on Mollie's practice. Like Mollie, he wanted to further explore the affordances of podcasting for oral language to be a springboard to learning other literacy practices and across the curriculum. He placed an emphasis on providing authentic learning experiences that connect learning in and out of school through technology and he worked closely with Mollie in the program so his influence on her practice could be described as significant.

The vignettes of Don and John highlight the engagement of two children in Mollie's learning environment. Don is significant because he was a reluctant writer. Mollie found that through the application of technology to the literacy context Don became an 'expert' at helping with computers in the classroom and this enjoyment he experienced when using technology seemed to have some transference to other literacy tasks where the use of the computer could be interwoven in the process. The second vignette, John, was significant to Mollie because John often found it difficult to settle at a task and work with other children. It seemed that the ways in which technology was applied to the literacy context seemed to support John to develop independence and this was something that she now identified as a challenge to extend into other areas of his learning.

Chapters 4 and 5 have shown Susie and Mollie's experiences of technology and literacy in their individual learning environments. In looking at the big picture the discussion in Chapter 6 summarises Susie and Mollie's experiences and discusses these in relation to the research questions.

CHAPTER 6:

DISCUSSION OF THE EDUCATORS' STORIES

Using narrative to understand the lived experience

All great truths are simple in final analysis, and easily understood; if they are not, they are not great truths.

Napoleon Hill, American Author

6.1: Introduction

Chapter 6 presents the discussion of the educators' stories. It brings together the elements of the narratives presented in Chapters 4 and 5 and situates them in the theoretical paradigm which underpinned the research. The story presented in this chapter endeavours to inform our understanding of each educator's experiences with the relationship between technology and literacy in the early years learning environment.

In order to seek understanding of the research question, *What are early years educators' experiences of technology and literacy in early years learning environments?* two questions were posed. These questions are *What are the beliefs, understandings and assumptions about technology and literacy practices that early years educators bring to the early years learning environment?* and *How do early years educators interweave and mediate technology and literacy use by children in the early years of education?* This chapter provides insights into these questions through discussion that focuses on key themes that emerged through the narratives. This is done in four sections. The first section discusses early years educators' beliefs, understandings and assumptions about technology and literacy practices that emerged during the study and considers how these may have influenced the educators' application of technology in the literacy context. The second section considers how the broader contexts of the educators' experiences may have impeded or helped them embrace innovation through a growing understanding of the relationship between technology and new literacies and the subsequent implications for practice. The third section uses Cambourne's (1995) conditions of learning (see Chapter 2, Section 2.2.3) as a framework for discussing each early years educator's application of technology to the literacy context. Particular attention is given in this section to the ways in which early years educators mediated children's experiences with technology. Further it explores how educators perceived children's engagement with technology in the literacy context. The final section of the chapter re-conceptualises Cambourne's (1995) conditions of learning. The re-contextualised model makes the potential of a mutually beneficial relationship between technology and literacy explicit and embraces contemporary views of literacy.

6.2 Early Years Educator Beliefs, Understandings and Assumptions about Technology and Literacy Practices

The narratives presented in Chapters 4 and 5 provided insights into beliefs, understandings and assumptions about technology and literacy practices that may have influenced Susie and Mollie's application of technology to the literacy context. To understand *why* educators' apply technology to the literacy context in the ways that they do the study needed to identify the beliefs, understandings and assumptions about technology and literacy which underpin the educator's practice. These beliefs, assumptions and understandings were explored in two different learning environments - the pre-school and the first year of school through educator interviews and educator learning story journals, with further data about observations and interactions between the research and the educator, the educator and the children and the educator and other staff members being recorded in the researcher journal.

The chapter begins by discussing the beliefs, understandings and approaches of Susie, then Mollie, at the beginning of the study. This is followed by a discussion about the similarities and differences between these beliefs, understandings and approaches. The last part of this section discusses these understandings.

Key Aspects from the Initial Interview

The initial interviews indicated that there were some similarities between the two educators in terms of their interest in, and competency levels with, technology. There were considerable differences between their pedagogical beliefs and understandings, and their learning environments. Although both educators shared a socio-cultural view of learning, Susie maintained an holistic approach to literacy, extending into a play-based approach to learning whilst Mollie articulated a functional view of literacy and described highly structured classroom teaching practices. Susie was able to identify a relationship between literacy and technology in terms of literacy as communication and technology as communication tools, and although she had observed this relationship in children's play she had not fully embraced it in her practice. Mollie, on the other hand, found the nexus between functional literacy and prescriptive technology most appealing in that within this perspective technology was nested as a 'tool' for teaching literacy skills. This shows that both Susie and Mollie thought of technology as a 'tool' and although not aligning with contemporary understandings (Chapter 2, Section 2.3) these understandings were significant. In this study the initial interviews were part of the professional learning intervention that began by identifying the existing beliefs and understandings of each educator. Edwards (2009) contends that effective professional learning begins with teachers' existing theoretical and practical understandings and should be used to ensure that all activities that are "professional learning is appropriately informed" (p. 92). These theoretical and practical understandings are now considered in detail.

6.2.1: Susie's Beliefs, Understandings and Assumptions about Technology and Literacy Practices at the Beginning of the Study

Literacy and Learning

The findings presented in Chapter 4 suggest that Susie's beliefs about literacy and learning at the beginning of the study aligned with a socio-cultural literacy perspective and view of learning. This seemed to be particularly evident in Susie's descriptions of the children engaging in literacy practices in play. In her example of children's play in the home corner where children incorporated a television remote, phone books, and note pads to make 'bills' (Susie I1B, p. 2) Susie described a perspective where social contexts are important for literacy learning. Further, she made reference to a cultural connection in her understanding of technology in her description of when children stopped using the cash register in their imaginary play and began to use imaginary electronic scanners. Her reflections on this change in children's play as being "reflective of what they know and what's in their life" (Susie IB, p. 7) are indicative of a socio-cultural perspective, of learning that resonates with contemporary play perspectives suggesting that changing culture is mirrored in play through children's active constructs (Elliott, 2010).

The data in Susie's narrative indicated that she embraced progressive approaches to literacy which resonated particularly with whole language (Chapter 2, Section 2.2.3). She demonstrated a belief that early literacy instruction begins with whole texts and meaningful units. This holistic approach is further implied through Susie's references to literacy as being about the "meaning behind the symbols" (Susie 1B, p. 4) and through her rich description in the initial interview of the children's literacy play in which signs were created by the children to carry a message for parents about what was happening in the preschool (Section 4.3). Susie described an holistic approach to literacy when she described the way she set up her classroom program so that "literacy is everywhere". Although she did not articulate any knowledge of Cambourne's (1995) conditions of learning at any stage of the interview, she described a view of literacy where learners were immersed in a paper based, print rich environment; "in all areas of the room," the children receiving purposeful demonstrations of how texts are used, thus aligning with the conditions of 'immersion' and 'demonstration' from the conditions of learning model.

In the initial interview Susie described an holistic approach to literacy in her descriptions of children's literacy play in the home corner. Table 6.1 shows that Susie's descriptions of literacy enriched play in the play learning environment reflected the qualities of play in literacy learning experiences described by Beecher and Arthur (2001) and highlighted Susie's holistic emphasis on literacy learning processes and integrated, meaningful and socially constructed literacy knowledge. An holistic approach was further acknowledged when Susie identified a key goal for her children as being to "use language appropriately". This response implied use of meaningful language units in appropriate contexts. Susie's holistic approaches to literacy in the play based learning environment had some extension to her conceptualisations of technology in the kindergarten.

Technology, Literacy and Learning

Susie's description of technology was brief: "anything that requires batteries, computers, cameras, and has an on and off button" (Susie I1B, p. 5) and was defined by Susie as a "communication tool" (Susie I1B, p. 5). It was this communicative aspect of technology that was evident in Susie's descriptions of the learning through play in the home corner. In the literacy play experience in the home corner (*Table 6.1*) Susie described children engaging in literacy practices with technology through play that they observed, or participated in, as part of their daily lives. These practices included watching their favourite programs on television, the television not working, phoning the electrician for assistance and paying the bill, as they experimented with associated literacy purposes and meanings. From Susie's example it can be seen that not only did the technology mentioned in Susie's previous description (*Table 6.1*) include an on/off button it also aligned with expanded views of literacy as social practice (Chapter 2, Section 2.3).

Although Susie described herself as a 'Gadget Girl' with a solid level of technological competence (Susie I1B, p. 5) and there were strong correlations in her initial interview between an holistic view of technology (Franklin, 1992) and socio-cultural literacy views, these connections were strongest in the examples Susie provided where technology and literacy were integrated into the children's play. In these examples Susie emphasised the importance of having access to resources such as phone books, mobile phones, and pens and paper in the home corner to be used in the play (Susie I1B, p2, 4). When Susie was asked about the children's use of a notebook computer in the classroom, its use aligned more closely with prescriptive technology (Franklin, 1992) as the notebook functioned as a learning centre containing age-specific software with games designed to teach specific skills (Susie I1B, p.5). In this way Susie's mediation of the children's use of the notebook computer at the beginning of the study was similar to the majority of practitioners in the study by Marsh et al. (2005) which found that the most common use of the computer in early childhood was with "age-specific software which aimed to introduce 'key skills', such as phoneme/grapheme relationships, numbers and shapes" (p. 54), or in Susie's example "shapes, letters and sounds" (Susie I1B, p. 5). This use of the computer parallels with Susie's view that a key benefit of technology for literacy learning is to assist the development of writing skills through word processing and the use of photographs to tell stories. Whilst it may not yet have been in her practice, Susie was able to articulate a vision for holistic technology integration through reference to technology being like literacy – "part of the whole program" (Susie I1B, p. 7) and she acknowledged that the purchase of a new printer could provide a window to bring this to fruition by providing access to the children to print their own work.

TABLE 6.1

Alignment between Susie's Description of a Literacy Enriched Play Experience and the Literacy Learning Processes

Susie's description of a literacy enriched play experience	Literacy learning processes (Beecher & Arthur, 2001)
1. I put in a remote control in first term and I just had it in one of the drawers, and the children found it. Of course they knew it was a remote control but they didn't have a TV, so some were pretending they were pressing it to the wall. Then another group decided that we actually need a TV so they went to the pasting table and actually made themselves a TV, so they were talking about where the numbers go and what buttons they've got.	1. Literacy learning use and focus is influenced by children, and by the meanings they carry, as they interact with others and with resources.
2. And then they came back and they set it all up, and they watched a few programs and then it all of a sudden it didn't work. So then they had to find the phone to ring the electrician.	2. Literacy learning is episodic. It flows with children's changing purposes.
3. They also had to find the phone book.	3. Children choose to use literacy understandings and processes for personal reasons.
4. We always have a phone book in there, so they were looking up the numbers and then when the electricians came they fixed it all up. But then they had their note pads and their paper and they wrote out the bills for them as well.	4. Literacy is symbolic. Children experiment with the process, conventions, purposes and meanings associated with literacy
5. So it was all this literacy that was happening just from what was available...It was just amazing. There was no words written on the paper but they knew exactly what it meant and how much they were going to charge, and of course it broke down again so they had to ring them again.	5. Literacy learning has its own momentum and focus, although children are likely to draw on 'truths' they have learnt from their own experiences.
6. That was a whole session but then it continued for a couple of weeks. They kept bringing it back to the pasting table and adding more to it and fixing things up and adding a power cord and all these amazing things. (Susie11B, 04.45)	6. Literacy learning is pleasurable for the learners.

For Susie, literacy and technology were inherently linked through meaning making. Literacy was about meaning making; "the meaning behind the symbols, behind the words" and technology a vehicle for communication: "the meaning behind why you use it [technology], what's the use for it". Communication seemingly linking both literacy and technology together for Susie would align this view with contemporary views of literacy as social practice (Cope & Kalantzis, 2000; Gee, 2003; Kress, 2000; Lankshear & Knobel, 2006; Turbill & Murray, 2006; Zammit & Downes, 2002) and in

many ways summarised Susie's conceptualisation of literacy and technology at the beginning of the study. However, Susie believed there were particular areas relating to her pedagogical understanding of technology that would benefit from further learning and these are described in the next paragraph.

Similar to the findings of the study by Marsh et al. (2005), Susie expressed a concern for a lack of professional development opportunities (Susie I1B, p. 1) in the area of technology. She self-identified as having an interest in, and competence with, using technology (Susie I1B, p. 1) but was unable to find professional learning with a strong pedagogical focus for those working in early years learning environments (Susie I1B, p. 5). Susie believed that most of the professional learning opportunities available were skills based at a very basic level: "basically for those that have no understanding of technology" (Susie I1B, p. 1) and whilst she believed all early childhood professionals should be competent with technology, she acknowledged that when it came to what happened in the classroom it often came down to going with "what is comfortable" (Susie I1B, p. 6). What is interesting to note here is that Susie identified a need to deepen her understanding about how to use technology rather than to improve her skills. This perceived need for professional learning aligns closely with models of reflective practice described in Chapter 2, Section 2.7.

The research model used in this study involved Susie in researching her own practice with the support of the researcher. Susie's reflections on the model and her learning are discussed in the second section of this chapter.

6.2.2 Mollie's Beliefs, Understandings and Assumptions about Technology and Literacy Practices at the Beginning of the Study

Literacy and Learning

In line with arguments suggesting that functional literacy is the predominant paradigm in early years classrooms in schools (Turbill & Murray, 2006; Turner & Turbill, 2007), data from the initial interview suggested that Mollie commenced the study with a functional literacy perspective. This was evident when Mollie stated "you can't read before you know a lot of your letters... and the sounds" (Mollie I1, p. 3). This functional influence further transpired in Mollie's discussions about approaches to literacy learning in the classroom.

In her initial interview Mollie referred to being literate as being able to communicate effectively. Her explanation of literacy as communication focused on reading, writing, listening, and speaking and aligned closely with traditional approaches as described, for example, by The New London Group (1996) as having emphasis placed on cognitive development and control over print based texts within the context of a national language. This view was further implied in the literacy learning goals Mollie described for her children with emphasis placed on developing children's confidence in reading, writing and speaking (Section 5.3). Furthermore, in her initial interview Mollie placed importance on what might be called entrenched teaching methods where "making sure it is pitched right" (Mollie I1, p.3) inferred a model such as Vygotsky's (1978) zone of proximal

development in which the level of teaching is ‘pitched’ at a particular level. Mollie’s further reference to instructional methods of guided reading, modelled reading and focussed group work (Mollie I1, p. 4) support arguments by Turbill and Murray (2006) that paper based views of literacy are strongly entrenched in school literacy programs in the early years.

Mollie described language experience as an approach used in her classroom program and provided examples of learning episodes using language experience (Mollie I1, p. 3; p. 4). However her descriptions of language experience in the classroom do not align with the progressive, holistic approaches from which language experience emerged (Chapter 2, Section 2.2.3). Mollie’s first example of ‘my dog’ was more akin to a brainstorm activity (Mollie I1, p. 4). The second example appeared to be one of shared writing where teacher and children worked together on composing the text and the teacher acted as the scribe: “the children would tell me about it and then *we’d* write something about it,” (Mollie I1, p. 4) rather than being an example of language experience (Chapter 2, Section 2.2.3) where a child’s personal experience is dictated and used as reading material in the classroom. It would appear that Mollie’s approach to literacy was similar to that of an early years teacher in a study by Turbill (2001) who “believed that learning to read involved a strong focus on learning to break-the-code of print” (p. 274). One reason for the difference in focus in literacy goals for the children by each educator may be related to the different contexts in which they were working. Literacy enriched play occurs more commonly in the pre-school period of emergent literacy whilst early literacy learning in schools often involves more formal literacy instruction (Chapter 2, Section 2.2). This could explain Susie’s emphasis on a range of literacy practices and Mollie’s emphasis on paper based skills to be mastered. Another explanation might be that their initial teacher education preparation as a primary teacher or as a kindergarten teacher, provided them with different philosophical and epistemological underpinnings.

It would appear that Mollie’s beliefs and understandings about technology were also influenced by functional and traditional perspectives and approaches. These are discussed in the following paragraphs.

Technology, Literacy and Learning

Mollie’s initial interview showed that she self-identified as having an interest in technology and felt competent in using technology in the classroom. However, Mollie acknowledged that using Macintosh computers and being in a Preparatory (first year of school) classroom for the first time had presented her with some new challenges. These challenges were in relation to developing a personalised approach to using technology in literacy learning with young children. When asked to describe her understanding of technology Mollie articulated a broad view of technology which extended from digital technology to Lego and play dough (Mollie I1, p.5). However, her descriptions of technology use in the classroom were similar to those of many early years teachers (Chapter 2, Section 2.6) where the key focus of technology use was as a ‘tool’ for the development of print based

literacy skills (Mollie I1, p.4). As this belief did not align with contemporary understandings of technology (Chapter 2, Section 2.3), it was important for the researcher to ensure that Mollie's professional learning experiences were informed by these existing beliefs (Edwards, 2009). Mollie described her use of I-Touches to foster learning of high frequency words (Mollie I1, p.4) and the use of podcasting software as a record keeping device, to record reading at intervals over time. (Mollie I1, p.5). Mollie noted that children were also beginning to listen to the reading recordings and to suggest ideas for improving their reading skills. These findings support arguments in favour of educators developing competency and educational understanding of new technologies for transformation in learning to occur (Labbo, 2006; Plowman et al., 2008; Turbill, 2003; Wohlend, 2009) as Mollie, although using the technology, was not exploiting its potential in the literacy context to the extent that she believed was possible.

Mollie articulated a desire to use technology more broadly in her classroom as her experiences had confirmed technology was an enabler for paper based literacy practices (Mollie I1, p. 9). To this end Mollie's vision for technology in her classroom had some elements of innovation in that she recognised a need for children to be competent and confident users of technology (Mollie I1, p. 9) and saw potential in using elements such as podcasting software to assist children to improve their reading, speaking and listening and hoped to find ways to use the computer to improve writing (Mollie I1, p. 8). Mollie's view of literacy and technology most closely aligns with prevailing early years paradigms created by the nexus between prescriptive technology and functional literacy perspectives whereby technology is described as an instrument for mastering literacy skills (Turbill & Murray, 2006; Turner & Turbill, 2007). Mollie's practice appeared to be driven by this view of technology. She articulated a vision for the integration of technology that extended to a process rather than product approach to children's writing (Mollie I1, p. 9) and more closely resembled calls for an emphasis on process and content "through an emphasis on the way digital resources are used rather than what they are used for" (Downes, Arthur et al., 2001, p. 145). Although this belief had not been put into visible practice in the Preparatory classroom, perhaps the articulation of this thought leads somewhat to understanding what Snyder (2008) describes as a willingness to "...engage with new knowledge...Even when the conditions are optimum, teachers choose only the bits that fit comfortably with their existing beliefs and repertoire of classroom strategies-the wisdom of practice so to speak". (p. 80)

Mollie's desire to use technology in all areas of literacy learning may have been influenced by school leadership. Pete, articulated in his interview a strong understanding of a beneficial relationship between literacy and technology for learning. He used examples of how he had observed podcasting improve children's oral language skills, and acknowledged a firm belief that as technology plays such a huge part in children's lives, and is inherently linked to literacy, it must be embraced in the whole school program (Pete I1, p. 7). Given that Pete was both the principal and teacher that Mollie taught closely alongside at the school, it is likely that Mollie may have been influenced by Pete's strong beliefs and understandings.

For Mollie, her emphasis on paper-based literacy teaching methods reflected the prevalence in early years classrooms in Victoria. Turbill and Murray (2006) have noted that the prevalence of these methods may have an effect on teacher uptake of technology in the classroom. This could be one reason why Mollie had not, at the time of the interview, put her new knowledge into practice as she was inexperienced in teaching in the early years and driven by teaching methods associated with CLaSS (Crevola & Hill, 2005) (See *Chapter 5, Section 5.3.3*) and the two hour teaching block. Mollie believed that technology could be integrated successfully through inquiry learning processes and through inquiry she believed that the children would be able to show their learning with technology in different ways (Mollie I1, p. 7). In line with the personalised learning vision of the school (Pete I1, p. 3), and the beliefs expressed by Pete, who identified technology as a key enabler (Pete I1 p. 3), Mollie expected that through inquiry the children would be able to use technology to find out different things, to show different things and that technology would act for the children as a guide in their learning (Mollie I1, p. 7). Interestingly, her descriptions of envisaged learning with technology seemed to sit outside the two hour literacy block, supporting claims that suggest entrenched teaching practices for reading and writing may take priority in early years classrooms.

The research model used in this study involved Mollie in reflective practice. During this process she was provided with opportunities to interrogate her beliefs and understandings about literacy, technology and learning. Her reflections on this process and key aspects of her learning are described in the final section of this chapter.

6.2.3 Similarities and Differences between Beliefs, Understandings and Assumptions about Technology and Literacy Practices at the Beginning of the Study

This section discusses similarities and differences between the beliefs and understandings about, and approaches to, literacy, technology and learning of the two early years educators at the beginning of the study. A series of minor headings are used as signposts for the themes that will be discussed.

Technology

The narratives in Chapters 4 and 5 suggest that Susie and Mollie believed that a key affordance of technology was the potential it created to foster learning in cooperative and collaborative learning communities. For Mollie the learning was in reference to the development of Macintosh computer skills where children supported each other and adults to use the computers (Mollie I1, p. 6). This view was mirrored by Pete who saw himself as a learner of technology alongside the children with technology (Pete I1, p. 4). For Susie, children's learning using technology was in reference to social learning; "children are learning with each other and with themselves," so it was particularly important to Susie that technology, particularly computers, were not used in solitary ways (Susie I1B, p. 6). These beliefs concur with those of Edgar and Edgar (2008) who place emphasis on the importance of cooperative learning when working with new technologies and with those of Johnson et

al. (2009) who note that learning with technologies in the real world happens mostly in groups and that this behaviour should be mirrored in classrooms.

Learning

The narratives suggest that Susie and Mollie had similar beliefs about children's learning. When asked to describe how she believed children best learn Mollie noted the importance of engaging student interests, providing authentic and purposeful learning experiences and building on prior knowledge (Mollie I1, p. 2). Mollie described inquiry curriculum as one way to engage children's interests. She used Grandparents Day (Mollie I1, p. 1) as an example of engaging children in authentic and purposeful learning experiences. In this example Mollie paid particular attention to the literacy learning that occurred when the children interviewed grandparents. The example Mollie described revealed tenets of constructivism through her efforts to engage children in reading and writing in an authentic context (Herrington et al., 2010; Snyder, 2008) and in her comments about the children's learning: "if there are skills or something they've learnt they can actually apply" (MollieI1, p. .2) that show her emphasis on children's individual growth and accomplishments (Chapter 2, Section 2.2.1). Pete also believes meaningful tasks provide children with "some degree of ownership" (Pete I1, p. 3) of learning.

Susie also made implied references to authentic and purposeful in her descriptions of interactions in the learning environment when the children created signs for parents and used remote controls, phone books and mobile phones in their play in the home corner. In the examples the children's application of skills and understandings to solve problems align with situated learning (Brown et al., 1989) . In this case a sign for the parents was developed by the children in response to a problem and created using the knowledge and resources of the children.

Susie and Mollie had similar beliefs about the need to cater for different learning styles. Susie advocated 'hands on' learning (Susie I1B, p. 1) and Mollie noted that "everyone learns differently" (Mollie I1, p. 1). Both educators acknowledged that making connections to the wider community and to prior learning were important through their individual references to excursions and working with parents (Susie I1B, p.6) and inviting the wider community into the school (Mollie I1, p. 1). Further, Susie described ways of extending students interests in areas of observed interest (Susie I1B, p. 6) in a similar way to Downes, Arthur et al. (2001) who pointed to the use of careful observations of young children when beginning to use digital resources in the program to ensure that children's learning experiences are meaningful and connect with the cultural experiences of the learner.

Personalised learning

It would seem that both Susie and Mollie had some tenets of personalising learning underpinning their repertoires as both teachers were strongly focussed on developing a curriculum around student interests, needs and learning styles, placing the child at the centre of learning in a way similar to that described by Keamy et al. (2007). Susie noted that whilst her goals for children were

similar from one year to the next, the way she went about achieving them changed depending on the children and she explained the importance of setting up a program where children have access to the resources they need to use in their play and extend their interests. Although Susie did not mention personalising learning theory, there were clear tenets in her child centred approach. Mollie on the other hand expressed a keen interest in professional learning with a personalising learning emphasis using technology as a key enabler. Theorists suggested that whole school educational administrative practices can influence teacher practice by limiting or effecting change (Snyder, 1996, 2002b; Turbill, 2001). A key motivating factor for Mollie's interest in this area may be the educational leadership and administrative practice provided by Pete. Pete communicated in his initial interview that he believed teachers needed to cater for children's learning styles more effectively (Pete I1, p. 4) and that technology could be a vehicle for learning and could enhance developmental curriculum at the school (Pete I1, p. 5). It would appear that Pete's influence and institutional leadership support was serving as a change agent for staff beliefs and practice.

Scaffolding

An area of difference between the two early years educator belief systems was in relation to scaffolding methodology. Susie used scaffolding methodology to set up play experiences and in her interactions with the children. Mollie used scaffolding as it related to Vygotsky's zone of proximal development (Vygotsky, 1978). In literacy-enriched play scaffolding provides a supportive framework that is dismantled as transference of responsibility for the task moves to the child (Beecher & Arthur, 2001; Hedges, 2000). For Susie the level of support given to assist a child with writing may vary from a child copying writing to Susie writing it for them (Susie 1B, p. 4). When it came to interactions, Susie's descriptions inferred scaffolding methodology when she noted "I've got to make myself stand back sometimes because if I come in it interrupts the children...it comes back to the curriculum the way you have set it up and the interactions" (Susie 1B, p. 1). Mollie's reference to scaffolding methodology relates to "making sure it is pitched right" in reference to literacy teaching (Mollie I1, p. 3). This colloquial comment is likely in reference to the zone of proximal development most commonly used to determine teaching groups and the point of instruction in early years classrooms at the time of this study.

Routines and classroom organisation

Both early years educators placed importance on organisation of the program (Susie 1B, p. 2, Mollie I1, p. 2). Susie identified the importance of having clear expectations and set routines in the classroom program for children to follow (Susie IB, p. 2). Comber (2006) identifies high expectations as a key component of relational work and describes the importance of having established routines and practices in providing access to resources as part of a teacher's institutional work. These two areas of teacher work are described by Comber (2006) as significant for engaging children in literacy learning. Mollie noted that a good explanation for activities was important (Mollie I1, p. 2) and this was a

desirable characteristic of literacy teachers espoused by Martello (2007) and of effective literacy teachers identified in the study by Loudén et al. (2005a).

Reliability of technology

Both early years educators had similar beliefs about the reliability of technology when working with it in the classroom. Previous studies have highlighted the importance of technology being ‘useable’ for practice to be sustained (Freebody et al., 2008b) and the findings from the initial interview suggest that a lack of ‘useability’ of existing technology may have contributed to a lack of sustained practice on behalf of both early years educators. Susie noted that even when she had access to a battery charger she would initially forget to charge batteries and although the MP3 player was almost unbreakable by the children, it was regularly deemed ‘unusable’ because it had not been charged (Susie1B, p. 5). Mollie referred to the unreliability of the internet and the compatibility problems with Macintosh computers and other peripherals (Mollie I1, p. 8) as contributing to unsuccessful classroom moments with technology. Susie further acknowledged that it was difficult to find time to use technology with the children in the classroom. This view could be interpreted as one of priority supporting claims by researchers that lack of uptake of technology by early years educators is largely due to a perception that it is not necessary in early years program (Brooker, 2003; Downes, Arthur et al., 2001) or takes too much time away from more important things.

6.2.4 Changes to Early Years Educator Beliefs, Understandings and Assumptions about Technology and Literacy Practices

This section discusses changes to educator beliefs, understandings and assumptions about technology and literacy practices which occurred during and at the end of the study. The ways in which educators more specifically mediated children’s experiences with technology and applied technology to the literacy context are described in relation to Cambourne’s (1995) conditions of learning in the third and final sections of this chapter.

By the end of the study early years educator beliefs and understandings about literacy, learning and technology appeared to have changed in some areas and the perspectives of both early years educators were more closely aligned. Mollie demonstrated growth in her understanding of the relationship between literacy and technology through her references to the integration of technology throughout the literacy program as part of the ‘process’: “We used technology several times throughout the process” (Mollie F5, p. 11). Mollie’s view of technology more closely aligned to an holistic view where the doer has control over the process of creation (Franklin, 1992). Bigum and Green (1992) have suggested that a critical-cultural literacy and ‘holistic’ technology nexus would be the most beneficial for student learning and Mollie provided examples in a literacy context which showed some alignment with this suggestion. Of particular relevance was Mollie’s description of the way in which podcasting was used as part of the editing process as a means of providing children with feedback on narratives (Mollie F5, p. 11). The examples in Mollie’s narrative of the children providing

feedback on narratives (Section 5.4.4) show how the children were encouraged to provide critical and constructive feedback to each other about animal adventures on the new school site. The feedback was recorded and used by the children to improve their written composition. The mediation of technology in this way supports a critical-cultural literacy and 'holistic' technology nexus through critical, constructive discussion on culturally relevant topics that are directly related to student interests using the seamless integration of technology.

There seemed to be strong similarities in other key areas of developing understanding between the early years educators. Both Susie and Mollie acknowledged in the final interviews that of key interest to them was the way in which the children engaged in learning with technology in a social and collaborative way. In the kindergarten the children's experiences with the digital camera and other various forms of technology were mediated through play. The children were encouraged to learn about technology and literacy through play and their interactions with others, and the children were given control over the direction of their learning. In the Preparatory classroom the tasks were designed by the teacher but the children usually completed the tasks in groups or pairs. When children were given solitary tasks to complete using technology they were encouraged to seek out others for assistance and collaboration throughout the process. Although the choice of technology in each context and the way in which the children's use of the technology was mediated by the early years educators differently, neither teacher anticipated the extent to which there were social and collaborative learning benefits associated with using technology in literacy. In an earlier study, Edwards (2005) suggested that early childhood educators who were interviewed about their use of computers in the classroom did not identify social learning benefits. In contrast, the findings from this study suggest that the potential of technology for social learning was a key area of development in early years educator understanding of the effective application of technology to the literacy context in early years learning environments. Mollie noted that providing children with opportunities to use notebook computers in groups fostered conversation, and that having a limited number of notebooks meant that children learned to share and work cooperatively (Mollie F5, p. 18). Similarly, Susie expected that the children would use the digital camera to take photographs as a record of their experiences but realised that the learning with the technology was more social than she expected as the children busily organised their friends and explored with the digital camera: "the children took it more to the social side of learning...(Susie F5, p. 4)". It would seem that these views are similar to those of Edgar and Edgar (2008) and Brooker and Sirj-Blatchford (2002) who highlight the importance of educators understanding the potential for using technology to engage children in cooperative learning.

By the conclusion of the study Susie and Mollie's narratives suggested that both viewed children as capable learners with technology. Susie was surprised at what, given time to explore, the children could do with technology (Susie F5, p. 1). Views expressed by others suggest that children's learning using digital media should be fostered through collaborative play and supported interactions (Brooker, 2003; Freeman & Somerindyke, 2001). For Susie, her belief that children were capable

learners with technology was underpinned by the collaborative play and supported interactions that had contributed to the children's learning styles being catered for and the children's initiative being foregrounded. For Mollie, her belief that children were capable learners with technology was fuelled by the experience of a new child in her class. A new child came to the school part way through the program that did not have a Macintosh notebook computer at home but learned very quickly how to use the computer and merged successfully with the classroom literacy program (Mollie C3, p. 3). This reflects the findings reported by Marsh (2005) who suggested that children are immersed in a wide range of digital literacy practices and are capable users of technology whereas Mollie had established a belief that they were also capable learners with technology.

Susie and Mollie noted that the support the children gave each other using technology extended beyond their peers. Susie shared the experiences of the children with technology, assisting and learning from each other, herself and other adults at a parent information meeting (Susie F5, p. 4) whilst Mollie described the way in which the children helped a pre-service teacher, a parent (Mollie F5, p. 21) and at times herself (Mollie F5, p. 19) learn how to use the computers in the classroom. It could be said that Susie and Mollie's view of the children learning together with the technology aligns with the view presented by Nixon (2001) who noted that the teacher is more of a facilitator of learning working alongside the children in a community of learners.

The extent to which the collaboration using technology was embraced in the literacy context was such that both early years educators noted a transformational effect on their programs. Mollie moved away from the two hour literacy block and found that technology could be integrated into her program (Mollie C4, p.5), art (Mollie F5, p. 14) and purposeful learning activities (Mollie C4, p. 14) as part of extended learning projects. At the beginning of the study Mollie's uptake of technology in the classroom may have been hindered by the traditional cultural separation of literacy and technology described by Snyder (2001, 2008). However, by the end of the study Mollie's beliefs about the application of technology in the classroom were more focussed on integration and the curriculum as recommended by the British Educational Communications and Technology Agency (BECTA) and Developmentally Appropriate Technology for Early Childhood (DATEC) in Brooker (2003), where experiences with technology were related to "where the children were at and what was going on" (Mollie C3, p. 3). Susie believed the experience of being part of the study had helped her to understand that technology "is so much a part of the children's everyday life" (Susie F5, p. 6) and that when the children were given the opportunity to explore with technology it became embedded throughout the program rather than used at set times in the program or in set areas of the room. The influence of the researcher and the scaffolding of the cycles would be a possible factor here. However this transformation corroborates that of Elliott's (2010) contention that effective communication now requires seamless movement between print and digital environments in which play landscapes represent a new guise for development and learning.

Children's Independence

One of the key benefits for Mollie of the seamless integration of technology into the program had been the way in which the children developed independence when using technology in her program. At the conclusion of the study Mollie described an example of a child who began the year frequently crying when asked to use a computer but who by the end of the year was a leader when it came to supporting others using the notebook computers (Mollie F5, p. 8). In her reflections, Mollie expressed an enthusiasm for continuing the program into the following year (Mollie F5, p. 11). Mollie believed the independence that the children had demonstrated using the technology had also moved into areas of literacy, particularly writing, as this had been a strong area of focus in her program (Mollie C4, p. 5). These beliefs concur with trends reported by Freebody et al. (2008b) who noted that there is a growing body of research suggesting that some uses of ICT in the classroom program may foster student independence in learning.

Oral Language

For Susie, the children's use of the digital camera had fostered a range of social interactions that she believed had in turn led to growth in oral language (Susie F5, p. 5). For Mollie, the podcasting platform provided a means for children to work independently on their oral reading and for the children to use the feedback the program provided to improve their oral and written skills. (Mollie F5, p. 18). These beliefs reflect suggestions put forward by Emmitt et al. (2010) that children are "active language learners, constructing meaning from texts in contexts" (p. 223). Pete also came to a similar view when he concluded that using the Macintosh computers and the podcasting software in an authentic context foregrounded oral language as a platform for literacy learning in other areas and this was something he was excited about and eager to pursue further with his staff (Pete F2b).

Meaning Making

Both early years educator beliefs about using the technology with the children in the literacy context were strongly connected to meaning making. As previously noted, Susie held this view from the beginning of this study, but Mollie developed the connection between technology and meaning making as the study progressed. Mollie noted earlier in the study that she believed learning experiences should be purposeful and perhaps this assisted her to make the connections with technology as the study progressed. What is of interest is that both early years educators noted an improvement in children's learning with technology over time. This may have been influenced by their involvement in the study and the opportunity it provided for Susie and Mollie to increase their own confidence in using technology in their program. For Susie the study had enabled her to use the digital camera with the children in ways more advanced than she would have thought to do previously (Susie F5, p. 4) but, in particular, she noted that given time for the novelty to wear off, the children's use of the camera changed and she was able to gain a deeper understanding of their literacy learning as the emphasis changed from camera skills to what the children were exploring (SusieLSJ2, p. 1).

Mollie on the other hand, described the application of technology to the literacy context as more closely connected to “where the children were at and what was going on” (Mollie F5, p. 12) and more focussed upon “allowing the children to be immersed in it [technology]” (Mollie F5, p. 12). These beliefs appeared to have some similarities to arguments for pedagogy which provides access to the meaning making potential of ICT and new literacies (Sefton-Green, 2001) as, for both early years educators, meaning making was at the heart of the learning experiences provided for the children.

6.3 How Individual Practices and Institution Organisational Practices

Impeded or Embraced Innovation

This study explored the interweaving of technology into the literacy program of two educators. Their narratives highlighted the individual practices and institution organisational practices that either contributed to or impeded the seamless interweaving of technology into the literacy program. This section draws on the narratives in order to gain insight into how individual and organisation practices impeded or embraced innovation with the application of technology to the literacy context. The insights gained contribute to our understanding of what may be important considerations for professional learning.

Pete the principal, through his leadership, influenced the extent to which Mollie embraced technology in the literacy context in her classroom. In the initial interview Pete articulated a broad and open ended view of literacy; “the capacity to engage in learning” (Pete I1, p. 4) aligning with his personal vision for the school around the four tenets of personalising education; learner as central, ICT as a key enabler, lifelong learning, and communities of collaboration. In the initial interview Pete acknowledged his core belief that a personalised approach to learning would provide meaningful, child centred learning experiences where technology, in particular the innovative use of podcasting, could be a key enabler of learning in the classroom (Pete I1, p. 3). Pete went on in the interview to acknowledge that he would be learning alongside the children when it came to using technology (Pete I1, p. 4) and a personal willingness to explore the affordances of using wireless technology in more flexible ways (Pete I1, p. 5). In a two teacher school learning environment like St Stephen’s these leadership beliefs influenced the way in which Mollie embraced technology in the literacy context in her Preparatory classroom. This can be identified in Mollie’s references to personalising learning as a key focus for her program (Mollie I1, p. 7) and the subsequent application of podcasting software to the literacy context. However it could also be argued that Mollie was supported through school leadership to foster learning in a community of learners through constructive alignment of teacher, principal and school goals. In the creation of the *St Stephen’s Timeline Podcast* the children who had not been at the school since the beginning of the year interviewed children who had been at the school throughout the year to find out more about the events that occurred earlier (Mollie LSJ2, p. 8). In this example Mollie fostered learning in communities of collaboration providing alignment with her beliefs, Pete’s belief’s and the developing school vision. These findings support claims by Darling –

Hammond (2003) that leaders contribute to the environment in “which accomplished teaching can flourish and grow” (p. 13) and could be described as enabling for innovative practice.

In the final interview Pete expressed enthusiasm to continue to work with podcasting software in the literacy and wider learning context in the classroom (Pete F2b, p. 4). Through the intervention (the action-reflection model) employed in this study he recognised a relationship between literacy and technology. In particular, it was through oral language and the use of podcasting software to foster literacy learning in other areas that innovation was recognised (Pete F2b, p. 7). The collaboration between principal, in a leadership position, and Mollie, may have been conducive to innovative practice. In contrast, in the kindergarten learning environment Susie, as the kindergarten director, was not in a professional learning environment where organisational support could easily be provided in terms of leadership. Susie was in the role of director and teacher at the kindergarten and although there were networks of which she was a part, the use of technology in kindergarten settings was not high on the agendas of these (Susie I1b, p. 1). For Susie, she believed it was through talking to others about what she was doing in the kindergarten with technology that assisted her to innovate more with technology in the program. Susie described the way in which justifying what she was doing with technology to the following years parents stimulated discussion (Susie C3, p. 2) and explained how she intended to further explore technology with the children in the following year (Susie F5, p. 3). The documentation Susie recorded in her learning story journal provided evidence to support her program, and to clearly present her case to the wider community which reflected the role of leadership in her story.

The Influence of the Action –Reflection Model

The professional dialogue and opportunity to interrogate ideas and beliefs through the implementation of the action-reflection model appeared to have benefits for the educators. Both Mollie and Susie reported on the opportunity the action-reflection cycles provided for sharing of ideas and debriefing before moving into another cycle. After the first cycle Mollie noted that children needed more ownership over the process when working with technology (Mollie C4, p. 8) and that the children needed more opportunities to work collaboratively on projects using the technology (Mollie C2, p. 2). So, in the second cycle, Mollie planned group and collaborative learning opportunities with technology and moved towards a more process orientated approach (St Stephen’s timelines, school narratives) that incorporated technology into the literacy program to ensure these aspirations for innovation occurred. In her final reflections on the study Mollie noted that one cycle informed the next as the professional learning that grew out of one cycle informed the direction of the next cycle and so on (Mollie F5, p. 14). These findings are supportive of findings from a pilot study by Edwards (2005) on why early childhood educators use computers. In the pilot study Edwards (2005) found that without appropriate professional support educators were unlikely to understand *how* computers could be effectively integrated into practice. In the present study professional support was provided through the weekly visits, discussions and suggestions. Findings from this study, suggest that early years educators

benefit from ongoing professional learning opportunities focussing on the application of technology to the literacy context which enable them to actively engage in learning, reflect and interrogate their own beliefs and practice in a supportive environment. On a cautionary note however, it is important to recognise that the professional support required varied throughout the study. At times support was needed in the form of a critical friend, at other times it was technical support, or as a mentor or facilitator of ideas. This can be a difficult role to undertake in terms of success, but it appeared to be important in terms of providing a supportive environment for technological innovation.

Susie noted at the end of the study that an interest in technology was something that she had always had, but through the study she had been challenged in her thinking to integrate it more fully into the literacy context than what she had done in the past (Susie F5, p. 4) . Thus it would seem that the opportunity to engage in professional dialogue and reflection and to justify practice was conducive to technological innovation and further enhanced through documentation practices which provide evidence of children's active engagement in learning.

The LSJs kept by both early years educators, provided documentation of critical incidents in relation to the children and early years educators engagement in learning throughout the study. The educators were encouraged to document critical incidents in learning across five domains. A key reason for using this documentation method was to foster professional dialogue about the children and the educator's learning through the processes of describing, discussing, documenting and deciding (Carr, 2001) with a view to document their participation in innovative practice with technology in the literacy context at the times it was the most successful. Stemming from the educator's perspective these documented incidents were then used to create the learning conditions in which to try other technological innovations in the literacy context. For example, Susie noted the different ways that children seemed to be using the digital camera to convey messages and recorded these in two LSJs; namely, cultural (Susie LSJ1) social (LSJ1), artistic (Susie LSJ2), symbolic (Susie LSJ2), and scientific (Susie LSJ2). It could be said that Susie's mindful observations of the children's active participation led to her noticing other modes of communication with the digital camera and video camera later in the year when the children used the digital camera to communicate as a vehicle for storytelling (Susie LSJ2) and the video camera as a vehicle for dramatisation using a television made from a cardboard box (Susie LSJ2). It would seem that this documentation supported technological innovation in the two case study learning environments. In their interviews both educators referred to evidence in the LSJs to describe children's learning and used this information to inform planning for the next cycle. The process of identifying critical incidents throughout the learning process where the relationship between technology and literacy is realised and ensuring it happens again in another learning experience was important for innovation and hence professional learning.

In the school learning environment Mollie's first LSJ contained some remnants from the traditional deficit based models of assessment more strongly characterised in traditional education settings where teacher accountability for children's acquisition of print and paper based skills is

characterised in gap filling models of assessment. For Mollie, looking for those times when things were going well with technology may have initially been a challenge but through the process of describing, discussing, documenting and deciding she was able to work through obstacles that could potentially result in disengagement and thus turn them into learning trajectories for continued technological innovation. For example, in the first LSJ Mollie noted that, “Trying to get the Preps to produce an e-book in I-Movie was a nightmare” (Mollie LSJ1, p. 5) because she had not provided enough scaffolding and practise with the technology and the children were not all competent with the program (Mollie C2, p. 3). However, Mollie modified the learning task and documented the changes she made. Through the action-reflection cycle she reflected on her documentation of the learning noting in particular that in future the children needed to complete the work themselves, needed to be more familiar with the program, have the experience with the technology, and needed to be scaffolded just as any good literacy experience (Mollie C2, p. 1). Using her learning from the critical incident recorded in the LSJ, Mollie was able to continue to plan for innovative technological practice. It would seem that reflecting on her practice affected change in her practice, which in turn, contributed to innovation and growth in her professional learning.

When a final year pre-service teacher came to the school for placement Mollie commented on the way the children assisted this pre-service teacher to use the technology and how this highlighted Mollie’s own growth in skill level and understanding (Mollie F5, p. 14). For Mollie, over time, she had embraced in her classroom practice a philosophical perspective where she did not see herself as a technology expert. In her words “we are all learning how to use the computers together” (Mollie F5, p. 19). Mollie believed that when the student teacher came to the school for an extended placement, it was through the support of the collaborative learning community that the student teacher’s skills were fostered (Mollie F5, p. 1). A similar view of collaborative learning communities supporting technological innovation was also held by Susie. Susie described times in the kindergarten when the children shared responsibility for ensuring that the camera was plugged in (Susie C2, p. 6) when the kindergarten assistant learned from the children how to use some of the features of the digital camera (Susie C2, p. 6) and times when Susie was learning along with the children (Susie C3, p. 4). For both educators it would seem that individual organisational practices that fostered collaboration in learning with the teacher as co-learner and guide appeared to be conducive to innovative technological practice in the literacy context.

The intervention that was employed in this study encouraged educators to critically reflect on their beliefs, assumptions and practices in relation to literacy, technology and learning. Through reflecting on these aspects of teaching it changed the way they looked at their learning environment. The educators were articulating their beliefs, understandings and practices in their teaching through narrative and story and found that their own and the institutional organisational practices could enhance innovation.

6.4 Cambourne's (1995) Model Applied to Main Findings of the Study

There are a number of different views and models of literacy learning and teaching, some of which were outlined in Chapter 2, including the 3D Model of Literacy (Durrant & Green, 2000), the Four Resources Model (Luke & Freebody, 1999) and the Multiliteracies Map (Hill, 2010). An important goal of this research was to explore the relevance of Cambourne's (1995) conditions of learning in the 21st century. From the investigation of the literature, Cambourne's (1995) model was considered the most appropriate because it is an holistic model. Further, the conditions of learning which form the model lend themselves as criteria through which the stories of the participants in the study (including the researcher as participant observer) can be analysed. The narratives in Chapters 4 and 5 showed that there were many parallels. This section discusses these parallels in relation to the conditions: immersion, expectations, responsibility, practise, approximations, feedback, demonstration and engagement. The model is applied to the early years educator stories of this study to gain insights into how early years educators interweave and mediate children's experiences with technology through their application of technology to the literacy context. Beecher and Arthur (2001) describe how the educators' role in children's literacy learning matches the conditions of learning. The explanations provided by Beecher and Arthur (2001) are used as a reference to consider parallels in Susie's play based learning environment in her mediation of the technology and the conditions of learning. Using the insights gained from the application of the model to the findings presented in the narratives the relevance of Cambourne's (1995) conditions of learning for the 21st century is considered and discussed.

6.4.1 Immersion

Cambourne (1995) refers to the condition of *immersion* as "learners being immersed in texts of all kinds" (p. 187) whilst Beecher and Arthur (2001) describe *immersion* in literacy-enriched play environments in terms of appropriate access to a range of literacy resources. Susie provided children with access to a range of literacy resources to explore. These resources included paper based and digital resources; books, writing materials, CD's, e-books, computer games and a portable DVD player. She also provided the children with a range of technologies including a typewriter, notebook computer, digital frame, printer digital camera and technologies for imaginative play; keyboard, mobile phone, phone books and registers (Susie LSJ1, LSJ2). The children not only had access to these resources, they also experienced visual and aural saturation or immersion (Cambourne, 1995) through being able to see, hear and interact with them throughout the kindergarten session. In this way the children were immersed in an information rich environment and provided access to, and use of, texts of all kinds. For example, Susie introduced the portable DVD player to the children with some well-known CD-ROM talking books, alongside the original books, and waited to observe the children's reactions. The children were immersed in an environment with both print and digital options. Of particular interest to this study was the use of visual and aural cueing systems which come into play when viewing video texts. The children's use of the DVD player in the kindergarten

demonstrated their immersion as the children exercised control as they stopped and started the e-book, weaving attention between the screen image and finding the matching page in the book (Susie LSJ2, p.4). As Carrington (2001) noted, and it would seem to be the case from this study, the context for approaching print-based textual practices was formed through multimodal viewing practices.

In Mollie's classroom there also seemed to be evidence of *immersion* in an information rich environment. Mollie's classroom examples of the children's photographs from the construction site and the poster sized timeline made from the photos were shared by all children in the creation of final school based podcasts. The communal timeline represented in Figure 5.21 (Section 5.4.4) provided an overview of the development of the new school. Throughout the learning process the children used a range of resources both print and digital - paper of different sizes, writing utensils, printed photographs, notebook computers, digital cameras, information books and printers. In both Susie and Mollie's classrooms children were immersed not just in print rich environments but rather in information rich learning environments which more closely align to the type of learning environments Johnson et al. (2009) suggest educational institutions should be working towards.

Zevenbergen and Logan (2008) reported that in many early years settings using technology is seen as the antithesis of good practice. Further, Reinking and Labbo (2004) argued that many educators perceive technology as a threat to print and paper based literacies. Through "multiple opportunities for children to experience" immersion (Cambourne, 1995, p. 415) the findings presented in the stories in this study seem to contradict these positions. In the kindergarten the children used the digital camera to explore different literacies. Susie described the example of Joe who wanted a written message recorded about the printed photograph he had taken (*Chapter 4, Figure 4.13*), the children's explorations of artistic representations (*Figure 4.10*) noted over time and use of cultural symbols in the children's photography (*Figure 4.11*). There was also the example of George who photographed symbols and integrated these into the imaginative play (Susie LSJ2, p. 1). Furthermore, the example of the creation of Snack Bear's locker involved the children in dialogue and sharing ideas, taking and viewing photographs, creating and decorating the label and moving between using materials, printed text and digital texts. It would seem that the paper based literacies which were embedded throughout the literacy experiences occurred with *immersion* of print and digital literacies in good practice.

Susie and Mollie described the children's *immersion* in technology in the literacy context as being socially beneficial for the children. The social benefits of technology in the literacy program were recognised in a study by Walsh (2010) however, Susie and Mollie described the rich interactions in close connection to the many opportunities that children had to be immersed in the resources in a number of different ways. Susie described the children immersed in various literacy practices using the portable DVD player to view CD-ROM talking books. She noted that the children moved between viewing the e-book on the screen to the printed text and engaged in dialogue about the story as they listened and viewed the texts (Susie F5, p. 1). These interactions could be described as socially beneficial as children mutually enjoyed and shared in interactions stimulated by the talking book.

Similar experiences were described in Mollie's classroom where print based literacies were embedded in the technology experiences of the broader literacy program and children were immersed in a range of practices and resources. Mollie's descriptions of the *Story of St Stephen's* school based podcasts (Mollie F5, p. 1; Mollie LSJ2, p. 8; *Figure 5.22*) demonstrate the children's movement between sharing ideas with each other and working independently, working with written and screen modes of images and words, and creating written and aural texts and immersion in a range of practices and resources printed and digital.

Johnson et al. (2009) noted in the Horizon Report that a key challenge for educational institutions is in the provision of customisable, flexible technological tools for learning spaces. Both Susie and Mollie found that access to customisable and flexible technology for *immersion* was an important part of their programs. For Susie, the children used the digital camera from the beginning of the study (Susie LSJ1, p. 3) and the purchase of memory cards enabled the children to be immersed in the technology. Once the children learned how to switch memory cards between the cameras, the printer and the digital photo frame (Susie C2, p. 4), the added flexibility of the technology enabled immersion in a range of digital learning experiences relating to the digital camera to occur simultaneously.

In Mollie's classroom immersion in an environment where the Macintosh notebook computers were always present, available, and used was significant throughout the literacy program. Mollie described the way in which the children worked in different spaces to create school based podcasts (Mollie C4, p. 9). Given the portability or flexibility of the notebook technology it could be said that the children were able to make decisions about the learning space they worked in which consequently assisted to improve the quality of their school based podcasts and ultimately their learning.

In each case study it appeared that through the condition of *immersion* in an information rich environment in a way that utilized flexible technology the interrelatedness of technology and literacy as social practice was realised as an enabler of literacy learning.

6.4.2 Expectations

Cambourne (1995) places emphasis on educators having high expectations for literacy learners. So did Susie and Mollie. Susie expressed a view that clear expectations for all children were important in her initial interview (Susie I1B, p. 1). Cambourne (1995) argues that high expectations of all children are important. Throughout the study Susie's high expectations with literacy and technology were evident in the children's explorations. When the children's photographs had an orange haze Susie's reaction was "with lots of trial and error the children slowly worked out that the orange that was appearing in their photos was due to their finger being over the lenses" (Susie LSJ1, p. 3). Susie expected that given enough time to explore with the digital camera the children would work this out for themselves and they did. High expectations and respect for all children prevail in this case through Susie's communication of confidence in the children's ability to learn together with

technology. This kind of pedagogy could be described as similar to ‘relational work’ referred to by Comber (2006) where believing in children’s potential and having high expectations can make a positive difference to children’s literacy learning. Mollie, on the other hand, reflected on expectations early in the first cycle and noted that when the children were creating e-books her expectations for what the children could do with the I-movie program were too high and she needed to modify the activity to make it more manageable (Mollie C2, p. 1). In her reflections at the end of the cycle Mollie reiterated that what she had learned from this experience was that a clear explanation was missing from the experience (Mollie C4, p. 8). Mollie recognised the importance of having expectations for all children to be independent when working with technology in the literacy program (Mollie C4, p. 8).

This reflection seemed to signal a transformation in Mollie’s thinking. She changed from intervening in the process and taking photographs, or typing children’s work, to insisting that all work with technology was a product of the children. Cambourne (1988) refers to teachers’ confidence about young children’s abilities to be successful as being connected to the condition of learning described as *expectations*. It could be said that Mollie experienced this realisation working with technology in the literacy context when she reflected; “I suppose letting them run with it and having the trust that they are going to do the right thing as well as letting them make the mistakes rather than taking over too much with the technology” (Mollie C4, p. 8). In this statement Mollie seems to be acknowledging the relational aspect of pedagogy (Comber, 2006) and the conditions of expectations in relation to the application of technology to the literacy context in the digital world whereby high expectations for the learning and respect for the children go hand in hand.

6.4.3 Responsibility

Mollie and Susie appeared to set up circumstances in their classrooms where children were given responsibility for learning. Cambourne (1995) emphasised that children are empowered to learn when they are given opportunity to make decisions about their learning. Mollie described the way children demonstrated *responsibility* by choosing to work through their lunch time to complete lifecycle slowmations (Mollie LSJ2, p. 13). Mollie further attributed much of the student responsibility to the introduction of *Learning on the Go* (Mollie, C5, p. 6) as she believed that children had responded to some choice in the sequence of the completion of tasks and the time spent on particular tasks in the literacy program. Mollie noted in her final reflections on the study that she believed *Learning on the Go* had contributed to children developing independence (Mollie F5, p. 9). Such an approach to pedagogy may concur with aspects of Anstey and Bull’s (2007) dynamic pedagogy with a focus on goal directed learning and children monitoring their own learning as the children in Mollie’s class were given choice in the order of tasks completed and were able to set goals for themselves using the checklist provided. Susie demonstrated similar aspects of dynamic pedagogy as children were encouraged from the very beginning to take their learning in their own direction: “here is something interesting we can explore – I wonder where the children will take it?” (Susie LSJ1, p. 1). When the popularity of the camera became a bit of an issue (Susie LSJ1, p. 4), instead of solving the problem for

the children Susie put the responsibility for solving the issue back on to the children: “I put it back on them...How do you think we can share the camera fairly?”(Susie LSJ1, p. 4). Through using this approach the children came up with a solution that was agreed to by all.

Beecher and Arthur (2001) believe that *responsibility* in early childhood contexts is realised through the integration of “literacy into everyday experiences” (p. 80) where children become empowered learners. The way that Susie integrated the digital camera into the everyday experiences enabled literacy learning to occur. For example, Susie reported on the use of a waiting list that the children in one group devised and the children in the other group automatically followed indicating how play with the digital camera had in the children’s minds become connected to other familiar routines and activities in the kindergarten (Susie LSJ1, p. 4) and children were empowered to integrate the practice elsewhere. A further example of *responsibility* in everyday experiences was documented by Susie in the creation of ‘Snack Bear’s’ locker (Susie LSJ1, p. 6). It could be said that the children were empowered through what Cambourne (1988) describes as a “willingness to make decisions about their learning, independently of the teacher” (p. 61). Susie described the way the children initiated this task and took responsibility for the creation of the name tag and locker for Snack Bear and summarised the children’s involvement: “While I was there to assist the children and occasionally offer ideas, it was the children who led in the decision making” (Susie LSJ1, p. 6). It would seem that the use of the digital camera, the printer and the computer were embedded in the process and interwoven with literacy in the everyday of the kindergarten.

Dalton and Proctor (2008) report that learners in the digital literacy environment require an ability to make choices and self-regulate behaviours in the wider changing landscape of text. This was evident in Mollie’s learning environment when a young child learned about self-regulating her literacy behaviours when she was told by Pete that she could not use the Magic words to check spelling in a writing activity (Mollie C4, p. 5). For this child responsibility came in the form of learning to self-regulate her actions within a changing literacy landscape, and is something that Andrews (2004a) urges should be fostered in an environment of teaching for choice within and across the communities of the digital learner.

6.4.4: Employment & Practise

Both Susie and Mollie appeared to provide opportunity for the children to practise and use the one form of technology in different ways in the literacy context over an extended period of time. This practice would seem to align with a condition of learning described by Cambourne (1995) as *employment*. Cambourne (1995) noted that for literacy learning children need non-artificial or authentic opportunities (Herrington et al., 2010) to use and practise their control over literacy and it would appear that this extends to the application of technology in the literacy context. Mollie described the ways in which children were able to work with the notebooks and I-Touches for extended periods of time throughout the literacy block and the ways in which using the technology in

the literacy context had benefits for student learning (Mollie C4, p. 3; Mollie LSJ2, p. 15). Some of the learning that Susie described was in relation to technology skills, student independence, reading fluency and expression, constructive feedback to peers and leadership. This developed through the children having opportunity to practise or use the one form of technology in a variety of different ways over an extended period of time. In particular, Mollie noted that the children were able to “save to folders and open things up by themselves and trying to just problem solve” (Mollie C4, p. 3) and other children were “able to become a leader if there was some sort of technology involved” (Mollie C4, p. 3) because opportunity to practise had enabled them to develop expertise. Further, the interactions between the children supported the learning process “because if one doesn’t remember how to do something the other does” (Mollie C4, p.10) so opportunity to practise contributed to a community of experts and a supportive community for literacy learning.

Beecher and Arthur (2001) describe the condition of *employment* or *practice* in terms of providing children with access to rich literacy materials and the freedom to practise. Susie noted that when “the novelty of the camera wore off...this allowed the children more time to explore what they wanted to do” (Susie LSJ2, p. 1). Susie provided access to the printer whereby the children could decide upon and print off their own photographs and noted that the children chose to do different things with the photographs they printed (Susie LSJ2, p. 2). It would seem that the condition of *employment* was present in Susie’s classroom when technology was applied to the literacy context and when the children were provided with an opportunity to explore using the technology in the literacy context in different ways. Susie described the way in which given time to practise and explore one child explored her reflection in the toaster, another busily photographed emergency symbols in the room and integrated these into his imaginative play, while another printed out a photograph to be used in her collage (Susie LSJ2, p. 2). Susie described the way that the children took their learning in different directions when she introduced the typewriter or ‘old technology’ to the room (Susie LSJ2, p. 3). In each case it could be said that through the condition of *employment* the children were using technology to learn about literacy in different ways; letters are symbols, these symbols can have meaning when put on paper and these symbols can be used as a form of creative expression.

In both the kindergarten and the preparatory classroom the application of *one* form of technology to the literacy context and the opportunity for *employment* or *practise* with the technology for an extended period of time seemed to have benefits. Susie noted that when the novelty wore off “the children took more time in exploring” (Susie F5, p. 1) and, in turn, Susie “was able to develop a deeper understanding of what the children were exploring and learning through the use of the camera” (Susie LSJ2, p. 1). It was during this time that Susie noted that the children were learning about different things and indeed different literacies. She noted the child who used the camera to communicate his knowledge of emergency symbols in imaginative play (Susie F5, p.1, Susie LSJ2, p. 1), children who explored artistic representations (*Figure 4.10*) and those who explored familiar cultural symbols (*Figure 4.11*). As the study progressed, Susie observed the children interweaving

back and forth between using technologies in general kindergarten play and imaginative play. She described examples where imaginary emails were sent amidst veterinary play in the home corner (Figure 4.26) and where detailed art work that once would have been referred to as a picture was described as *Ellie.com* by its young creator (Researcher Journal). In a study by Carrington (2001), findings suggested that children arrive at school with other literacy practices besides those associated with print-based texts. It would seem that some of the children in the kindergarten were demonstrating knowledge of these practices through play in the home corner and through drawing.

The scenario was similar for Mollie. In Mollie's reflections she noted that it was important "to skill them [the children] up to be able to do it [use the software] later on" (Mollie C4, p. 9). Mollie's comment was in reference to children developing competence with the technology before any real gains in literacy learning could be made. In particular, Mollie made reference to the way that the children's learning through podcasting had progressed from children supporting each other with podcasting and working in groups, to children being competent enough to record individual school based podcasts and making decisions relating to the quality of the podcast and oral literacy as opposed to focusing solely on technical skills (Mollie C4, p. 9). Dalton and Proctor (2008) report on research findings suggesting that digital learners find learning in the digital environment engaging but often at a superficial level. In both case study classrooms it seemed that given time to practise and explore using one form of technology in the literacy context, once the novelty factor diminished and some technological competence amongst the children developed, the early years educators began to notice children learning literacy with technology in different ways at a deeper level, and in ways more applicable to meeting the needs of a diverse range of learners. Similar findings were reported in a study by Downes, Arthur et al. (2001) where the importance of moving past the novelty when using digital technology was highlighted through approaches that embrace process and content.

Cambourne (1995) refers to two kinds of opportunities for *employment* or practise. The first is social where young learners require social interactions with others to learn literacy and the second requires time alone to practise and reflect. Children need social opportunities to practise or use their developing literacy knowledge for real and authentic purposes (Cambourne, 1995). A study by Marsh et al. (2005) found that young children in 'out of school' settings engaged actively and in a social way with media and technologies, with engagement usually occurring in shared living spaces. It follows that the condition of *employment* when applied to technologies and communication should also occur in shared and interactive spaces. Susie described the children's use of the digital camera in a social way as they organised each other for photographs and posed for the camera (Susie LSJ1, p. 3, Susie LSJ2, p. 2) but more significantly in the way that the children interacted with the technology in the classroom. The children often chose to share their photographs with one another using the viewing lens of the camera or the printed images. Susie summarised the social aspect of the children using the technology by stating "it was interesting to see how the children worked together not only to share the camera, but also to share the experience" (Susie LSJ1, p. 3). This observation transpired across the

introduction of other aspects of technology. For example, with the employment of the portable DVD player the children were observed sharing stories and problem solving together (Susie LSJ2, p. 4) and when using the notebook computer to view the class multimedia presentation (*Figure 4.25*) the experience was a social one.

Cambourne (1995) describes a second kind of *employment* where learners have time alone to practise and reflect upon their literacy learning. With the application of technology to the literacy context both early years educators described a high level of interactive and participatory employment however there were minimal references to children practising alone with technology in the kindergarten context. In the Preparatory classroom the opportunity for *employment* in a solitary way did seem to exist and was reported on. Mollie described episodes when children wanted to work alone when creating school based podcasts (Mollie C3, p. 3) or when children chose to listen to instructions on I-Touches rather than seek help from others (Mollie LSJ1, p. 15). Individual children engaged in literacy practice with technology but did not choose to share the experience with others. Just as Cambourne (1995) suggests that it may be that both kinds of *employment* are necessary for children to gain control over language development, as we begin to better understand the relationship between literacy and technology, perhaps new literacy practices will require both kinds of employment for digital communication practices.

In Mollie's classroom there appeared to be a progression from what began as largely solitary work whereby children created an individual e-book using Macintosh notebook computers through to children working together on literacy tasks such as creating group narratives (Mollie LSJ1, p. 5) to children working on a combination of solitary, paired and group tasks where variations occurred throughout the process according to perceived need. An example of this fluid organisation could be identified in the creation of the school narratives (Mollie LSJ2, p. 9). At times children worked alone and listened to the instructions on the I-Touch to proceed with the task (*Figure 5.24*). At other times the whole group worked together to support each other in their learning, such as providing feedback on the writing drafts (*Figure 5.25*), and Mollie noted that there were times when the students supported each other with the editing process (Mollie LSJ2, p. 12, Mollie C4, p. 5). Even after the school narratives were published the opportunity for employment in a non-artificial and social manner continued when the older children in the school showed interest in the books created by the Preparatory children. The interest generated from the publication of the books provided an authentic context for Mollie's children to practise reading and sharing to a wider audience. In this way the experience fitted with the description of authentic learning described by Comber et al. (2007) in that the activity was socially important, meaningful to the children and action orientated in that it was driven by the construction of the new school and central to the experiences of the whole community.

The data from both case studies confirms findings in a study by Walsh (2010) that a collaborative and cooperative approach to learning occurred amongst students' when an holistic approach to using digital technologies was implemented. Walsh (2010) noted that when students had a

purpose, usually relating to the use of digital technologies, the purpose was achieved through a range of collaborative interactions. In the examples described above the children in Susie's classroom interacted with each other using the technology to explore ideas and concepts and through taking on the role of literacy users in their play. An example of the children taking on the role of literacy users as digital natives engaging in collaborative interactions is highlighted in the descriptions of the children playing in the home corner after their visit to the vet clinic where the group of children playing together incorporated sending imaginary emails as part of the veterinary play. In Mollie's classroom, the collaborative and cooperative approach was described throughout the process of the children creating school narratives and, to a greater or lesser degree, in most learning experiences described in the program. Mollie described the collaborative nature of the relationship between buddies working on life cycle animations as being engaging enough to keep some children working together over lunch times (Mollie LSJ2, p. 13), and children interviewing each other to find out information for their timeline podcast (Mollie F5, p.3, MollieLSJ2, p. 8) or to show their understanding of a maths concept using literacy (*Figure 5.28*). The children in both Mollie and Susie's classrooms were given the opportunity to employ and practise developing knowledge in interactive contexts throughout the learning process.

6.4.5 Approximations

Cambourne (1995) refers to making mistakes and using *approximations* as essential for literacy learning. Mollie noted that learning with technology in the literacy program required this condition. Mollie gave the example of one child who frequently lost his work on the computer but eventually learned to save it in the right place (Mollie C4, p. 8). In her reflections on the first cycle, Mollie came to the realisation that when the children were working with technology it was important that the work was their own and that they learned from their mistakes (Mollie C4, p. 8). Mollie believed that one of the benefits of this approach in her classroom was that it fostered student independence with technology use. This view concurs with reports by Freebody et al. (2008b) suggesting that some classroom uses of ICT have increased independence in student learning. In her final reflections on the study Mollie noted that student independence in learning with technology was something that continued throughout the program (Mollie F5, p. 6). For Mollie, a number of factors went hand in hand with developing independence: student choice; "the freedom to just go and do what they want to do" (Mollie F5, p. 10) (Responsibility), "the confidence in them [children] to be able to save it [work] correctly" (Mollie F5, p. 10) (Expectations) and "learn from their mistakes" (Mollie F5, p.10) (Approximations). Mollie noted that independence in learning extended beyond mastery of technology skills and into other areas of literacy learning including writing, spelling strategies (Mollie C4, p.5) and oral reading (Mollie F5, p.18).

Beecher and Arthur (2001) refer to *approximation* in literacy enriched play as an emphasis on process rather than product. Throughout the first cycle Susie's descriptions of the children learning using the digital camera appeared to show a progression from the development of technical skills

required to be able to use the digital camera effectively; for example keeping their finger away from the lens to prevent orange haze (Susie LSJ1, p.3), to the digital camera becoming a vehicle for communication and self-expression of ideas, children posing for photographs or arranging objects artistically (Figure 4.6, 4.7, 4.10) and using the printed photograph or the viewing screen on the camera to view photographs and engage in dialogue with friends (Figure 4.20). Through encouraging *approximation*, learning was fostered. In one such example Susie referred to the children using symbols in the photography which suggested cultural explorations (Susie C3, p.1) as they mimicked what they had seen others do.

Transformational learning is described in terms of learning for social futures or in terms of “personal communication and cultural transformation” (Kalantzis et al., 2005, p. 47). In the examples described above personal communication was a key motivation for the children learning to use the digital camera to communicate ideas in different ways, and cultural transformation was something that Susie alluded to in her mid-cycle reflections when she noted that she still wanted to continue using the digital camera with the children “because it has become part of the everyday program now.” (Susie C3, p. 5). Mollie, demonstrated in the examples of *approximation* above, it would seem that it was the journey or the process that was important for learning and it could be argued that independence in learning beginning with technology and literacy skills may lead to a broader literacy platform that is education for social futures where citizens are independent thinkers and problem solvers.

6.4.6: Response

Cambourne (1995) refers to *response* in the learning environment in terms of providing timely and appropriate feedback. Susie and Mollie appeared to employ the condition of *response*. In her reflections Mollie noted that a benefit of podcasting was that children gained immediate feedback on how their reading sounded and used this information to improve their oral recordings (Mollie LSJ1, p. 10). A similar observation was also made by Pete in his final interview in his reference to the self-checking or self-conferencing potential of podcasting whereby the actual process of recording a podcast acted as a monitoring and feedback device for the children during the drafting process of writing (Pete F2b, p.7; p. 8). In her Preparatory classroom Mollie integrated podcasting into the writing process in a way that could be said to provide feedback or *response* and foster critical reflection. Through the podcasting of group feedback on the drafts of children’s stories, the children were able to critically reflect on their work and the work of others (Mollie F5, p. 3; Mollie LSJ2, p. 9). Mollie suggested that the application of technology to this traditional ‘literacy share circle’ activity enabled each child to be able to access the feedback received from peers individually and use the feedback to improve their story (Mollie C5, p. 4). Mollie described the way in which the children’s feedback shifted from feedback on their oral reading towards constructive feedback on each other’s stories (Mollie LSJ2, p. 9). In the example provided, one child helped another recognise that a sentence didn’t make sense and another child provided a useful suggestion to help the same young

writer ensure that the intended audience knew what kind of creature the main character in the story was (Chapter 5, Section 5.4.4).

In another example of feedback Mollie described the feedback received by the Preparatory children from the ‘seniors’ when they shared their published narratives with them. Mollie was impressed with the positive feedback for the Preparatory children’s publications which extended throughout the school as the books became popular class reading (Mollie F5, p. 8). Mollie was particularly pleased with the praise extended to one child from a group of ‘seniors’ as it provided this child with feedback that was not always accessible to him by peers in his classroom (Mollie F5, p. 9) and yet was readily available and relevant.

In literacy enriched play settings Beecher and Arthur (2001) note that effective educators support children’s literacy learning through the condition of *response* by providing feedback, displays of children’s work and opportunities to share written work with families. The condition of *response* existed in the application of technology to the literacy enriched play environment of Susie’s kindergarten through the way in which some children printed their photographs off to share with their friends (Susie LSJ1, p. 5) whilst others such as Joe chose to record a written message with his picture and take it home to share with his family (*Figure 4.13*). In another example, Susie described a child, who took a photograph of a friend pretending to be asleep, then printed it off and drew a picture beside the photograph of his friend awake. He was so pleased with his final piece of work that he wanted to share it with everyone so Susie displayed it in the classroom (Susie C2, p. 6) and he enjoyed the responses from others about his work. The different ways in which response could be obtained aligned more closely with the different communication practices in society. The children could receive response from their friends in their kindergarten learning community immediately after taking a photograph. The children could receive an immediate response using the technology by viewing the photograph on the camera after it was taken and determine whether they were happy with the quality or whether they needed to delete it and take another photograph. Finally, the children were able to print and prepare a copy of their photographs that they could then take away from the kindergarten to receive feedback from others in the wider community. The children’s use of the digital camera highlighted how through its use for communication, a range of opportunities were available for response or authentic feedback from all three learning communities (Andrews, 2004b).

6.4.7 Demonstration

Through demonstrations of “how texts are constructed and used” (Cambourne, 1995, p. 187) the condition of *demonstration* is said to occur. In Susie’s learning environment *demonstration* was evident in the creation of the veterinary story (Chapter 4, Section 4.4.3, Learning episode 12) and in her description of scribing a sentence for Joe (Chapter 4, Section 4.4.1, Learning episode 3). In these examples Susie demonstrated writing in a similar way to that described by Beecher and Arthur (2001) as she showed the children how to form letters and modelled writing. In what could be described as a

re-contextualised example of the condition of *demonstration*, Susie demonstrated artefact use and function (Cambourne, 1995) of the playback feature of the digital camera. After further social interactions with peers, the children were then able to apply this knowledge to the learning situation and decide whether or not another photograph was required (Susie C3, p. 3).

Mollie recognised the importance of a good *demonstration* when she made a podcast demonstrating how to write a narrative. Mollie used technology to ensure an explicit literacy focus by providing detailed instructions in the form of a podcast placed on an I-Touch which could then be used on an individual needs basis by providing individual children with access to instructions for the task which could be replayed at point of need as often as required (*Figure 5.24*). Mollie's use of technology for *demonstration* in this way could be said to align with a personalised view of learning (Chapter 2, Section 2.4) through attention to student needs, learning styles and the use of flexible and interactive technology in the form of providing explicit instructions on an I-Touch as an enabler of learning (Keamy et al., 2007).

A further example of demonstration but this time of deconstructing a text, occurred when the children in Mollie's classroom were making lifecycle slowmations. Although Mollie indicated that she had provided scaffolding in the form of a planning template (*Figure 5.17*) and provided support for the Prep children with older buddies (Mollie LSJ2, p.5, Mollie C4, p. 11) the result was still not what she expected. Cambourne (1988) refers to an effective *demonstration* as being functional and relevant. Mollie decided to use a model of the digital text to demonstrate to the children how it was constructed and used. After showing the children the model and deconstructing the digital text the children were able to complete the task thus supporting the view that a functional and relevant *demonstration* can promote learning. Perhaps when using technology with young children clear explanations and explicit teaching should be a part of each *demonstration*, as Mollie's final comment on the learning experience after a functional and relevant *demonstration* was implemented seemed to reveal: "The students knew what their lifecycle was, and were all able to know what needed to be done to complete it." (Mollie LSJ2, p. 13).

An explicit literacy teaching focus was a strategy that Mollie had previously identified as important for teaching and learning and used throughout her program. In the creation of *school narratives* Mollie described the way in which she identified a need for a specific focus on adjectives and subsequently modified her program to ensure an explicit focus on this area (Mollie LSJ2, p. 9). As the study progressed Mollie noted that an explicit teaching focus was something that she needed to incorporate into her teaching with technology too. For example, when the children were creating *life cycle* slowmations Mollie realised that she needed to provide them with explicit instructions and demonstrations for saving and using the technology if they were to successfully create and complete the slowmations (Mollie C5, p. 2).

In Susie's kindergarten there were times when explicit teaching or direct strategies were used to ensure that the children had the technological skills and knowledge to be able to continue with the literacy enriched play experience. One such example occurred after the digital frame, and the memory cards were introduced. Susie noted that some children "still ask for help occasionally but they're actually learning how to change it [memory cards] around themselves" (Susie C2, p. 4) as the need for direct instruction decreased. In the play context the explicit technology demonstrations provided by Susie could be likened to the explicit teaching within meaningful contexts in literacy enriched play settings referred to by Beecher and Arthur (2001) and perhaps as a further extension of *demonstration* and explicit teaching of literacy practice. In the example of the Pet Rock's holiday there was no need for the children to print off the photographs to tell their story as the storytelling could be carried out using the play back feature and the screen.

6.4.8 Engagement

Cambourne (1995) argues that the conditions of learning must be accompanied by student engagement for literacy learning to occur (Figure 6.1). In researching their own practice the early years educators described a range of examples of what they perceived to be children's engagement in learning when technology is applied to the literacy context. Whilst engagement was not an explicit area of focus of this study inevitably the children engaged as was demonstrated by George. This vignette has been discussed in relation to the condition of engagement and highlights engagement in a range of different ways. Further research with children is required to provide direct insights into children's learning when technology is applied to the literacy context.

George's engagement in learning was described by Susie on all three levels: affective, cognitive and operative. Susie noted that what George photographed with the digital camera was important to him and that he wanted to share with others the photographs he had taken (Susie C2, p. 3) indicating engagement at the affective level. Susie also described engagement on the operative level throughout the study through her reflections on George's explorations of photographing people posing, movement with the camera and photographing different textures and symbols. On a cognitive level Susie referred to George's engagement through his leadership in knowing how to help others with the technology (Susie C2, p. 4) and through his ongoing eagerness to extend his inquiry, for example, by taking photographs of someone taking photographs of him (SusieC2, p. 5) or taking photographs through different textures or of moving things to see what happens.

Susie noted the way in which George responded with enthusiasm to the introduction of the digital camera to the kindergarten classroom (Susie C2, p. 3) and that surprised her because she had noticed that he hadn't taken an interest previously in the notebook computer, which was set up as a learning centre in the kindergarten. However George's engagement on the affective level with using the camera could be indicative of what Marsh et al. (2005) found in their study as the social way in which young children engage with technologies in prior to school settings. This was further reinforced

during researcher visits when George was observed eagerly sharing photographs on the digital camera with his friends (Susie C2, p. 3). In the exploratory approach to learning that Susie fostered in the classroom, George worked out how to use the viewing lens, delete photographs he didn't want to keep (Researcher Journal) and took on a leadership role when it came to swapping memory cards around (Susie C2, p. 4). George also seemed to attract others into his play with the camera as they explored taking different kinds of photographs together. It would seem that George's motivation to use the digital camera in the play setting was an example of Comber et al.'s (2007b) description of providing children learning experiences with authentic purpose and context. For George, using the digital camera in his play appeared to be: *socially important* -he was able to share the photographs he had taken with his friends; *action orientated* -when taking photographs through different textures and of movement George's purpose appeared to be to see what happened and then, to share his findings with his friends; (Section 4.2.7) and *meaningful learning* - George's experiences using the digital camera appeared to be integrated, by his own choice, into a range of his play experiences in the kindergarten, such as imaginary play experiences after the visit from the fire brigade (Susie F5, p. 1), exploration of movement and texture (Figure 4.30), creative expression in taking photographs of others taking photographs of himself (Susie C2, p. 5), as a social vehicle in being the class photographer (Researcher Journal), and through helping others use the technology (Susie C2, 12.17). Cambourne (1995) suggests that children need to practise using oral and written texts purposefully and by extension it could be argued that children need opportunity to engage in purposeful communication practices aligning more closely with the digital world they live in.

Mollie described the learning of a child in her classroom in terms of increased independence in his work habits, competence with using the computer and cooperation with others (Mollie C4, p6, and p.13). Mollie noted John's enthusiasm for learning with the computer through explorations (Mollie C4, p.6). In relation to Luke and Freebody's (1999) four resources model, it could be said that in the *code breaker* role John used the voice recording mechanism of the computer to record his ideas and later transcribed the recording into text and Mollie noted that this level of engagement in written text signified an improvement in John's work habits (Mollie C4, p. 6). Furthermore, Mollie noted that the opportunity for John to voice record his ideas before writing had improved the quality of his sentence writing in length and vocabulary (Mollie C4, p.6). Similar findings were identified in a study by Goldberg, Russell and Cook (2003) which suggested that children who use computers when learning to write produce better written work than children who use pen and paper methods. Mollie further described a learning episode where John showed her a function relating to the battery on the Macintosh notebook with which she was unfamiliar (Mollie C4, p. 15). It could be suggested that Mollie's descriptions of John's literacy behaviours closely aligned with the *functional user* on the multiliteracies map (2010) and further supported her view that he was learning through his engagement with the technology in the program. These findings concur with trends identified by Freebody et al. (2008b) showing increase in student motivation, engagement and independence in learning with particular classroom use of ICT.

6.5 Re-contextualising Cambourne's (1995) Conditions of Learning

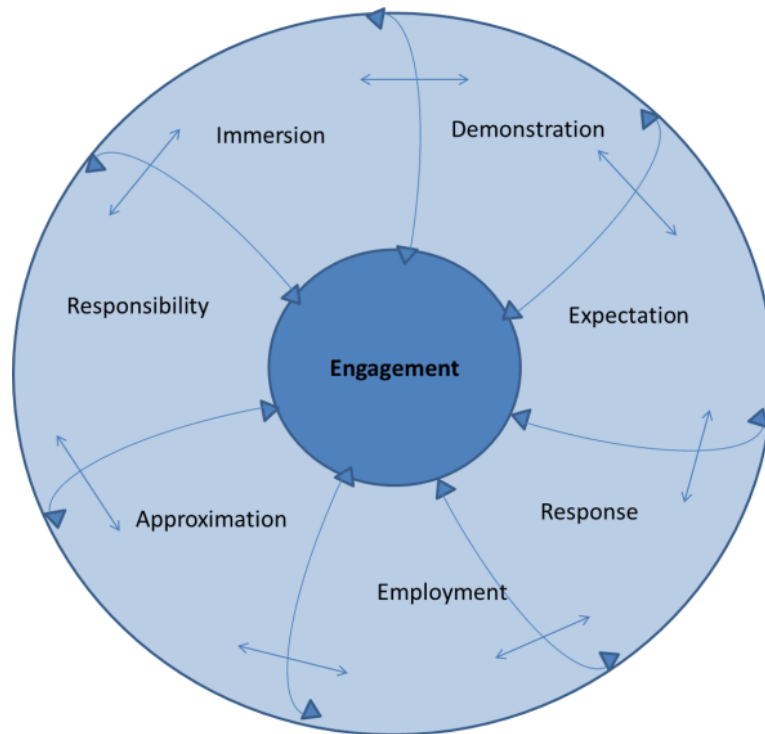
The question underpinning this study was, *'What are early years educators' experiences of the relationship between technology and literacy in early years learning environments?'* This question was operationalised by two further questions. The first research question was, *'What are the beliefs, understandings and assumptions about technology and literacy practices that early years educators bring to the early learning environment?'* and the second question was *'How do early years educators interweave and mediate technology and literacy use by children in the early years of education?'* Cambourne's (1995) conditions of learning are the lens through which the second question was then analysed. Using this lens an argument for re-contextualising these conditions for learning can be made.

Figure 6.1 shows Cambourne's conditions of learning described by Harris, Turbill, Fitzsimmons and McKenzie (2001). The model shows engagement as central to learning and the conditions of learning: demonstration, expectation, response, employment, approximation, responsibility and immersion, as synergistic and influencing the extent to which engagement occurs. Through the analysis of the narratives a number of enhancements which re-contextualise the model became evident. The first enhancement is one which suggests the incorporation of language and terms that embrace expanded views of literacy and the application of technology to the literacy context. The second enhancement re-contextualises some of the conditions to incorporate understandings associated with the application of technology to the literacy context. Finally, it was opportune to explore how the original model is conceptualised and expressed in the more contemporary learning environment of the digital world where the learner is at the centre of three learning communities: school community, out of school community and an ICT community, all of which interact within and across each other (Andrews, 2004b). Figure 6.1 represents a re-contextualised version of Cambourne's (1995) conditions of learning which the findings of this study suggest. This model is discussed in detail in the following paragraphs.

From the inside out, the enhanced model suggests that early years educator knowledge of the child is infused in the conditions of learning, and underpins the planning and implementation of authentic learning experiences embracing the three learning communities of which the child is a part. When the synergies in these relationships are fully realised across each level it would seem that engagement in learning through the lens of a contemporary view of literacy as communication is optimised.

FIGURE 6.1

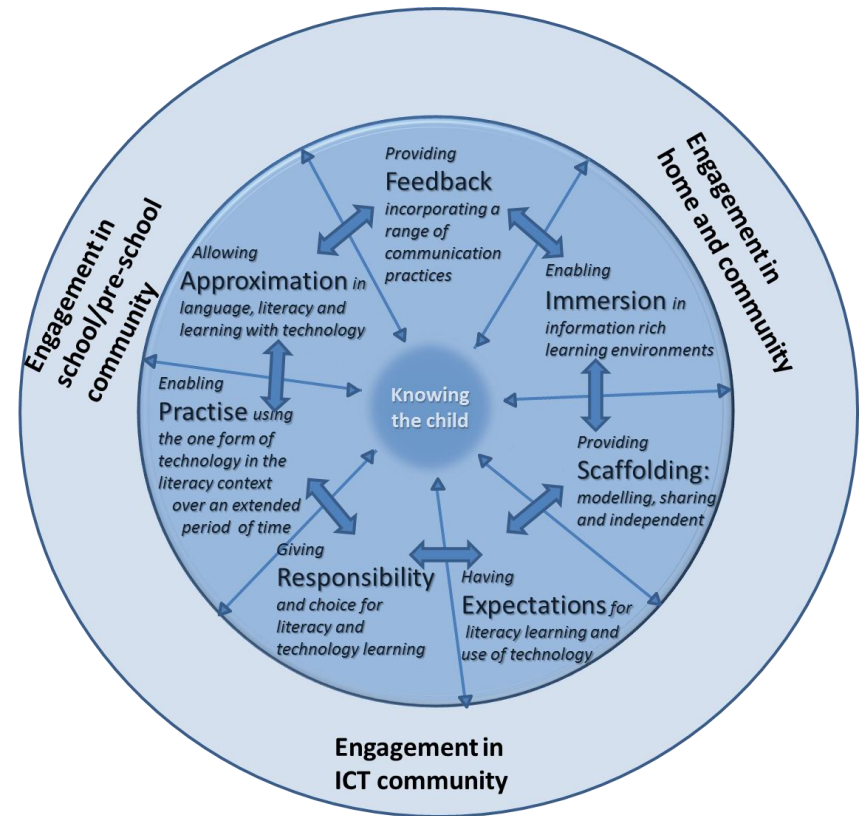
Model of Cambourne's Conditions of Learning showing Engagement at the Centre of Learning.



After Harris, Turbill, Fitzsimmons & McKenzie (2001, p. 13)

FIGURE 6.2:

Cambourne's (1995) Conditions of Learning Re-contextualised for the Young Literacy Learner in the 21st Century.



Engagement or Knowing the Child

The new model recognises the importance of early years educators knowing each child in their classroom and places this knowledge of the child at the centre of the model. Although *knowing the child* may have been implicit in Cambourne's model (Figure 6.1) the re-contextualised model makes it explicit. By placing *knowing the child* at the centre of the model an emphasis is placed on consistency between children's literacy learning experiences in the digital world and their literacy learning experiences with technology in formal education settings. In the study early years educator knowledge of the children was evident when the early years educators described the importance they placed on both following and generating children's interests (Mollie I1, p1; Susie I1B p. 4) and accessing and using children's prior knowledge (Mollie I1, p. 2; Susie I1B, p. 3) for literacy learning. Identification of children's needs (Mollie I1, p.7; Susie C3, p. 2) and prior knowledge can be accessed through formal and informal assessment and used to inform planning for children's learning. In this study the Learning Story Journals (LSJs) represented one way in which educators could document their knowledge of children's literacy learning across five domains (Mollie LSJ1, LSJ2; Susie LSJ1, LSJ2). Of particular significance, was the knowledge early years educators accumulated throughout the study of young children's interests and needs and how well this knowledge came into play when young children engaged with technology in the literacy context. For example, the knowledge Susie gained, through the observations recorded in LSJ entries, of George's social interactions using the digital camera enabled her to plan for, and scaffold, the learning experiences with the digital camera. Mollie seemed to demonstrate a similar knowledge of John's needs when she described the way in which she provided opportunities for John to work by himself using the computer in order to foster independence (Mollie C4, p. 6). Edwards (2009) reports that when teachers "become more alert to culturally valued forms of learning children bring to their classrooms" (p. 91) they reflect more on the implications through understanding of the "reciprocity between social and cultural experiences and the pedagogical worlds within their classroom walls" (Edwards, 2009, p. 91). Thus it could be said that the placement of *knowing the child* at the centre of the model has particular significance in a technological world. Implications outlined in a study by Carrington (2001) on family literacy practices in suburban Australia suggest children arrive at school with a range of skills which may not be those associated with traditional print-based texts but will be required of literate citizens. For educators this highlights the need for *knowing the child*, knowing what these skills are and building on these skills and knowledge in the literacy context. The placement of *knowing the child* at the centre of the model aligns with socio-cultural views of literacy discussed in Chapter 2 which highlight the need for teachers to acknowledge and use the funds of knowledge children bring with them to literacy learning (Clay, 1998; Kennedy & Surman, 2007) and contemporary personalised views of learning where an appetite for learning across society, or the three learning communities, extends from a child centred curriculum (Leadbeater, 2005). However, Cambourne's (1995) model does not readily acknowledge this relationship.

It would seem that early years educator knowledge of the interests, needs and funds of knowledge that young children bring with them to literacy learning are essential in programs acknowledging diversity. If early years educators *know the child* in their classrooms then this knowledge will underpin the conditions of learning created by the teacher thus increasing the likelihood of each child's engagement in literacy learning. The new model also acknowledges that literacy learning occurs between three communities: the home community, the school or formal education community, and the ICT community. It would seem that early years educator knowledge of the child is infused in each condition of literacy learning, and through a range of learning opportunities which draw both on children's experiences in each of these communities and foster learning within and across them. Just as the conditions of learning are described as synergistic, the three communities to which the digital learner belongs could also be described as being interrelated in a synergistic way.

Immersion or Saturation

Cambourne (1995) refers to *immersion*, as it relates to literacy learning, as saturating learners in texts of all kinds through use and access. The findings of this study suggest that young literacy learners benefit from being saturated in information-rich learning environments which incorporate print and multimodal texts. In information-rich learning environments access to flexible, customisable technology and working spaces were significant factors in ensuring children were able to engage cognitively, operatively and affectively in learning. Another nuance of *immersion* in this study was in reference to the entwining of print and digital literacies in a process orientated approach to using technology. *Immersion* in this sense seems to support findings by Walsh (2010) which indicate that digital communications technology can be integrated into the literacy program alongside paper based literacy learning, thus retracting fears that attention to digital technology in early years classrooms will detract from children's learning of paper based literacy skills. The narratives support the contention that *immersion* in information-rich literacy learning environments where technology is used in a way that aligns with the learning needs of the children at a given point in time throughout the learning process is conducive to literacy learning. The model (Figure 6.2) proposes that *immersion in information rich learning environments* is a re-contextualised condition of learning whereby in information rich learning environments connections can be made in and across all three learning communities. When the synergies in these relationships are fully realised across each level it would seem that engagement in learning through the lens of contemporary view of literacy as communication is optimised.

Demonstration or Modelling in a Scaffolded Approach

The condition of *demonstration* was described by Cambourne (1995) as "the ability to observe (see, hear, witness, experience, feel, study, explore) actions and artefacts" (p. 185). Throughout the narratives the educators provided "contextually- relevant demonstrations" (Cambourne, 1988, p. 50) or, demonstrations within an authentic context. That is, the educators provided contextually relevant

demonstrations with digital communications technology such as how to use the play back feature of the camera (Susie LSJ2, p. 4), or, at times, an explicit focus on particular multimodal or technology skills such as the step by step process of how to create an animation (Mollie C4, p. 11). In a re-contextualised view, it could be said that, *demonstration* more closely aligns with *modelling* in a scaffolded approach.

Cambourne (1995) does not refer to scaffolding as a condition for learning. However scaffolding methodology did emerge from progressive approaches (Chapter 2, Section 2.2.3) and given the contextual role of the educator in mediating technology it must be considered how the teacher not only provides *demonstrations* when technology is applied to the literacy context but also how children's experiences with technology in the literacy context are supported or scaffolded.

In a study by Loudén et al. (2005) scaffolding of learning was identified as an important literacy teaching practice for effective teaching. The importance of scaffolding of learning may extend to the application of technology to the literacy context. As already alluded to in the Preparatory classroom Mollie found that scaffolding of children's experiences with technology was essential. Initially, when creating e-books on the water cycle there were "just too many skills that needed teaching" (Mollie C4, p. 2) so, in order to ensure that all children completed the task, Mollie was forced to modify the task. Although the final result was time consuming and involved more of Mollie's input than was intended, Mollie learned from this experience and was careful to ensure that she used scaffolding with the technology in her future planning. This scaffolding was particularly evident in the templates provided for life cycle animations, story of St Stephen's school based podcasts and school narratives which provided children with a clear structure and template for the task. Mollie also scaffolded the life cycle animation learning experience by providing a demonstration of the deconstruction of a simple animation so that children could see the slide transitions and apply this knowledge to the animations they were creating (Mollie C4, p. 11). This scaffolding was evident when children were creating the St Stephen's timeline podcast where Mollie created a folder of photographs taken by the children to be used in the creation of the final podcast. The folder contained a selection of approximately twenty photographs and was easily accessible by the children. By putting the photographs into one folder and limiting access to twenty photographs instead of one hundred, the Preparatory children were able to create a podcast without being overwhelmed by technical issues, thus ensuring that the literacy learning remained the focus of the activity and the technology entwined in the process.

Beecher and Arthur (2001) refer to scaffolding as a mediating strategy in the way that it provides a supportive framework for literacy learning. In the kindergarten it was through the introduction of peripherals that Susie scaffolded the children's learning experiences with technology. After the novelty of the camera began to wear off, Susie introduced the printer, the digital frame and the memory cards (Susie C2, p. 4). With the gradual introduction of peripherals and the need for children to learn to swap the memory cards between the peripherals the children continued to explore

the technology in the classroom and take their learning in the direction of their interest. Susie believed that the ability to scaffold children's learning "comes with practise" (Susie C3, p. 3) and valued the importance of "knowing when to step back and let them [children] direct and when you need to scaffold and give ideas" (Susie C3, p. 3).

Susie saw her role not as a director of learning, but as a guide or facilitator of learning. Pedagogy that places teachers in this role is associated with 'process' orientated approaches to teaching and learning and more commonly referred to as pedagogy aimed at designing learning for social futures (Kress, 2000, 2006b). Unsworth (2008) refers to the teacher's role as mediator of new literacy and technology knowledge and understanding within social learning contexts. Both Mollie and Susie described episodes where teacher mediation or scaffolding fostered new learning. Susie described a learning episode in the kindergarten where a sound issue preventing the children from hearing the multimedia presentation that they created was resolved when she intervened and encouraged the children to apply their knowledge to the new situation (Chapter 4, Section 4.4.3, Learning episode 11). Similarly Mollie provided instructions on an I-Touch to ensure that all children could complete the task (*Figure 5.24*). It could be said that through teacher mediation of the children's access to, and use of, technology children engaged in meaning making.

Community

As the study progressed it seemed that Mollie moved more towards the role of teacher as facilitator or guide of children's learning. One significant example of the way in which Mollie used a mediation strategy to encourage children's learning was in the way in which she encouraged new children to the school to interview other children to assist with the creation of their individual St Stephen's podcast rather than simply providing these children with the information required to complete the task. It could be argued that the way in which Mollie facilitated the learning of these children was similar to how Papert (1993) urged educators to involve children in activities with technology which are meaningful and socially important and in this case self-directed with a local emphasis. Mollie also fostered a sense of community amongst the children as the children who were new to the school were encouraged to seek out the information required to create a podcast with as much enthusiasm as those children who had been at the school from the beginning of the year.

Pedagogy for literacy and technology and the notion of a community of learners occurs when the teacher teaches and learns along with the children. Both Susie and Mollie described learning communities in their classrooms. In Susie's classroom children were observed assisting each other with technical issues which arose with the DVD player (Researcher Journal) whilst Susie reported how the kindergarten assistant learned at times from the children to use the technology (Susie C2, p. 6) and Susie herself learned how to use the printer alongside the children (Susie C3, p. 4). Mollie also noted the way in which the members of her classroom seemed to operate as a community of learners particularly when it came to providing support to each other and other adults when using the

technology. Mollie described an example where a parent helper needed assistance with using the notebook computer and the children competently explained to the parent the purpose of the activity and assisted the parent to use the software (Mollie LSJ2, p. 13; Mollie F5, p. 6). Over the course of the study Mollie realised that the children were able to support each other in their learning with technology. In both Mollie and Susie's classrooms an autonomous relationship was fostered whereby the skills and expertise of the all members of the group were valued and used to foster learning with technology and in a way which aims to foster the development of literate citizens as described by Kellner (2002), the New London Group (1996) and Comber et al. (2007b).

Andrews (2004a) described the digital learner as being at the centre of three core communities; the school community, out of school community and the ICT community, which in an interrelated way may support learning (*Figure 2.2*). When viewed in this way the child as the digital learner is very much a part of a learning community where it would seem from the narratives of this study that *demonstrations*, scaffolding and explicit teaching in each of the three core communities may be necessary and should occur in the communities as they interrelate. In both learning environments the learning community was fostered through mediating strategies whereby the teacher was, for the most part, in a facilitator or guiding role of children's learning and employed scaffolding strategies to ensure learning within and between these communities was supported. This would suggest that the condition of demonstration may be reconceptualised to embrace these elements in a re-contextualised model.

Through scaffolding, early years educators mediate children's literacy learning experiences to support growth towards independence. The study found that modelled, shared and independent strategies were used to support children's learning in reading, writing, listening, speaking, viewing and creating with technology. Educators also found that there was a need to scaffold learning with technology in both learning environment case studies. Susie gradually introduced peripherals and technology equipment to the children so that time was provided for children to develop expertise (Chapter 4, Section 4.2.3). Mollie on the other hand, learned through her experiences with the children's attempts at creating e-books (Mollie, Learning episode 2) the importance of scaffolding, and made a conscious effort to scaffold children's experiences with technology following this episode. This was particularly evident in Learning Episode 9 (Chapter 5, Section 5.4.4) where Mollie used scaffolding strategies in the form of planning templates, joint constructions of a large timeline, shared sequencing of events using the timeline, and Learning on the Go (LOG) for student organisation of learning. She also used scaffolding to contain the use of photographs to a manageable number, and in encouraging community social interactions that fostered knowledge construction. In each learning environment the educator's acted as a guide for children's learning and moved fluidly between roles scaffolding learning for the children. In addition, using technology in a process orientated approach meant that at times the educators were learning alongside the children and at times the children were learning from each other and this seemed to indicate that scaffolding was occurring on a range of

levels in the classrooms. Evidence of this can be found in Susie's acknowledgement of learning alongside the children with the introduction of the printer (Susie, Learning episode 3), George's leadership with technology in the kindergarten (Chapter 4, Section 4.6) and Susie's observations of the kindergarten assistant learning from the children how to use the various functions of the digital camera (Chapter 4, Section 4.4.2). Further evidence from Mollie's learning environment is provided when Mollie witnessed the emergence of technology experts amongst the children who assisted both children and other adults (Chapter 5, Section 5.4.4; Chapter 5, Section 5.5) and when Susie recognised her own learning occurring alongside the children (Chapter 4, Section 4.4.2). Teaching and learning with technology in this way fostered a learning community where the affordances of the relationship between literacy and technology had been realised. The model proposes that in a re-contextualised context *knowing the child* as central enables *scaffolding* of learning in a technology infused literacy context to be appropriate to individual children's needs, and in turn fosters authentic learning experiences in and across all three learning communities.

Expectations and Responsibility

Having clear expectations of children's literacy learning is important (Cambourne, 1988, 1995; Comber, 2006; Loudén et al., 2005a). The study supported the idea that *expectations* extended to children's use of technology. It was important that children knew what was expected of them when using technology, but also that these expectations were realistic and achievable. For example, Mollie acknowledged that she had expected too much of the children when it came to choosing from many photographs to create an e-book and that these unrealistic expectations had made the task unachievable for some children (Mollie C2, p. 1) until she modified the task. Both educators acknowledged the importance of having expectations that the work with the technology would be the children's own. Mollie realised after spending copious amounts of time finishing children's work on the computers that children had to do it themselves (Mollie C4, p. 8) and Susie had clear expectations that the children would be responsible for their learning early in the program when an issue emerged with sharing the technology (Susie LSJ1, p. 4). In a re-contextualised model with *knowing the child* as central early years educators are able to communicate clear *expectations* in relation to literacy learning and the use of technology in and across all three learning communities.

A tenet of personalising learning identified in the literature review was providing children with choices (Keamy et al., 2007) for learning. Cambourne (1988, 1995) describes the importance of children feeling empowered as the condition of *responsibility*. In this study the condition of *responsibility* appeared to extend beyond the children making choices to engage in print literacy demonstrations. Children were given choice and responsibility when using technology in the literacy context. As described previously, examples of children being given choice and responsibility in Susie's learning environment were noted in Susie's references to the children problem solving with technology (Chapter 4, Section 4.4.1) and in providing the children choice in the direction of their learning with the digital camera taking their learning in different directions (Chapter 4, Section 4.4.3).

Further evidence of responsibility was also provided in Mollie's learning environment (Chapter 5, Section 5.4.4). These choices and the responsibility that extended from making these choices offered empowerment to the children as the learning with technology in the literacy context became deeply entwined in the everyday life of the classroom. The model proposes that with *knowing the child* as central the condition of *responsibility* can be re-contextualised to take into consideration the importance of providing choices when using technology so that children learn to self-regulate their behaviours within and across the three learning communities.

Employment or Practise

The opportunity for children to use and practise their learning about literacy and language is described by Cambourne (1995) as the condition of employment. Cambourne (1998) noted the importance of a "multitude of opportunities" (p. 71) for children to practise their language and literacy in authentic and meaningful ways. The findings from this study suggested that opportunity to practise with one form of technology over an extended period of time was conducive to literacy learning. The activity orientated, process approach to using the technology in the literacy context provided many authentic opportunities for the children to use the same technology in different ways. The children's interactions with the technology varied; individual, paired, group and whole class, however these interactions were consistently social and seemed to be fostered within a collaborative learning environment whereby even those tasks that were individual in nature involved collaboration with others. For example, experts emerged to assist others with technical issues (Mollie F5, p. 10) and children using the digital camera engaged with groups in organising photographs (Susie C3, p. 1). These findings concur with those of Walsh (2010) who noted that holistic approaches to working with digital technology seemed to encourage collaborative and social forms of communication. Further, the literacy learning that children engaged in with the one technology entity was significant over the extend period of time. In Mollie's learning environment the opportunity to practise or use the podcasting software fostered a range of literacy practices: podcasted feedback to improve composing skills; podcasted mathematics interviews encompassed reading, writing, listening and speaking; narrative instructions fostered listening skills, and monthly readings for self-conferencing skills (Chapter 5, Section 5.4.4). In Susie's learning environment, it was the range of literacy practices which children engaged in that was significant. Susie observed children using the digital camera to capture emergency symbols for meaning making in play (Chapter 4, Section 4.4.3), for social interaction when setting up posing (Chapter 4, Section 4.4.1, Learning Episode 2), demonstrating cultural understanding when using the 'V' symbol (Chapter 4, Section 4.4.1, Learning Episode 2), understanding of communication practices when sending emails at the veterinary clinic (Chapter 4, Section 4.4.3, Learning Episode 12) and using the play back feature of the camera for storytelling (Chapter 4, Section 4.2.4, Learning Episode 7), just to name a few. It would seem that through holistic approaches to the application of technology to the literacy context, opportunity to explore the one form of technology in different ways enabled deep literacy learning to occur. Thus, the new model proposes

that through *knowing the child* with learning needs and interests as central, the condition of *employment* or *practise* can be re-contextualised to emphasise *practise* with one form of technology over an extended period of time in order to allow for deep literacy learning occurring within and across the three learning communities.

Approximation

Approximation as a condition of learning refers to fostering children's literacy learning by encouraging children's attempts at literacy and language and subsequent learning from the experience (Cambourne, 1995). In this study, holistic approaches to planning for the program placed an emphasis on *process* and *content* with the application of technology to the literacy context. In both case study learning environments learning through trial and error with technology was very much a part of the learning process. (Chapter 4, Section 4.4.1, Cycle One, Learning episode 2, The Digital Camera in the Classroom; Chapter 5, Section 5.4.2 Reflections on the first Action-Reflection Cycle, Section 5.5 Mollie's Final Reflections). It seems that a re-contextualised view of approximation in this model also puts *knowing the child* as central. *Knowing the child* enables the early years educator to have an understanding of appropriate *approximations* for each child in a *technology for literacy* context as these *approximations* occur within and across the three learning communities.

Response or Feedback

In the re-contextualised model, *feedback* refers to what Cambourne (1995) described as *response*. In Cambourne's (1995) model *response* is what "learners receive back from the world as a consequence of using their developing language knowledge and skills" (p.186). Cambourne (1995) highlights the importance of appropriate response that comes from more knowledgeable others. In this study feedback attained through using technology throughout the literacy learning process appeared to be conducive to developing children's competence with technology and in turn to literacy learning. An example of children using feedback to further engage in learning can be found in Susie's description of her facilitation of learning during the creation of Snack Bear's locker (Chapter 4, Section 4.4.1).

Feedback that was provided to children throughout the learning process was not necessarily from an adult. At times constructive feedback was provided by peers. For example, in the feedback provided through shared circles during the drafting process of the school narratives (Mollie C5, p. 4). At times the technology itself provided a mechanism for constructive feedback; the children's recording of reading which provided immediate feedback on fluency and expression (Mollie I1, p. 7), or in children's audio recordings of drafts where self-editing occurred in the process of moving from written to aural or where self-feedback could be given using playback (Pete F2b, p. 8). In Susie's learning environment an example of children using feedback to further engage in learning can be found in the description of children experimenting with the play back feature of the digital camera (Chapter 4, Section 4.4.3). The model shows a re-contextualised view of *feedback* that puts *knowing the child* as central. *Knowing the child* enables the early years educator to provide appropriate

feedback using communication practices which embrace technology and which are contextually appropriate within and across the three learning communities.

Engagement

According to Cambourne (1995) active participation and purpose for learning is important for *engagement*. This study suggests that through a re-contextualised lens the conditions of learning existed in the two learning environments and engagement in learning occurred. In each narrative there are descriptions of engaged learners. In Susie's learning environment there was the example of the children who used the digital camera to tell their 'pet rock' story (Chapter 4, Section 4.4.3, Learning Episode 7), having challenged any conventional need to use a printed version of their text as the play back feature of the digital camera provided a socially important communication medium to suit their purpose and audience. In the Preparatory learning environment Mollie described the way in which children engaged in using podcasting software to record feedback for each other about their stories, and how this process was enabling for learners who benefited from hearing feedback more than once (Chapter 5, Section 5.4.4, Learning Episode 11). Mollie placed value on an entwinement of literacy and technology and the centrality of oral communication throughout the literacy process (Mollie F5, p. 11), in which children were actively engaged in the process of learning. The re-contextualised model recognises that *knowing the child* as central informs contextually appropriate conditions for learning within and across the three learning communities. Engagement in learning seemed to occur when these conditions existed.

The re-contextualised model may be useful for educators in the 21st century as it provides a model that considers the role of educators as mediators of technology applied to the literacy context in a familiar way as well as intrinsically embracing the work of Cambourne. The model is holistic. Technology and literacy are interwoven throughout the model. The new model acknowledges a mutually beneficial relationship between technology and literacy that is realised through the application of enhancements to align with re-contextualised views of literacy in the 21st century. The incorporation of language and terms such as *enabling immersion in information rich learning environments* provides language appropriate for using the model in the contemporary literacy context. Further, placing *knowing the child* at the centre of the model is an important enhancement to the model. It acknowledges the myriad of experiences that children bring with them to learning, particularly in relation to technology. This understanding is central to educators' pedagogical practice because, as the mediators of children's technology and literacy learning, engagement is sought through providing meaningful and authentic learning experiences that build on, and connect, children's technology and literacy experiences inside and outside of formal educational learning environments. The model may also be useful for educators because it re-shapes previous conditions of learning to embrace technology applied to the literacy context. In particular, it is through considering *scaffolding* as a condition in which the educator moves between *modelling and demonstration*, *shared* and *independent* roles in process orientated, technology infused, literacy environments that the fluidity of

interactions using technology in flexible ways can be fully realised. Finally, the model may be useful in assisting educators' to understand how their practices can foster a realisation of the mutually beneficial relationship between technology and literacy in the contemporary early years learning environment.

6.6 Summary

This chapter has discussed a number of important findings regarding educator beliefs and assumptions about technology, literacy and learning that emerged as a result of the action-reflection activity model of the study. The chapter also discussed the findings in relation to the major questions of the study. It elaborated on ways which educators interweave and mediate technology in the literacy context using an holistic model, Cambourne's (1995) conditions of learning. Finally, it proposed some enhancements to the model based on the early years educators' experiences of technology and literacy in their early years learning environments. These enhancements were considered in a re-contextualised model which embraces expanded views of literacy within and across three communities. The re-contextualised model is a useful model to inform educator practice. The ideas presented in the enhancements of the re-contextualised model of the conditions of learning and that have emerged for professional learning inform the final chapter of this study. The final chapter draws together the story of the research and offers recommendations for further research.

CHAPTER 7

THE EVOLVING STORY

Conclusions and recommendations for future research

We learn more by looking for the answer to a question and not finding it than we do from learning the answer itself.

Lloyd Alexander

7.1: Introduction

In Chapter 7 the threads of the exploration and stories are brought together. The chapter commences with a brief summary of the study and then addresses the major question of the research. The second part of the chapter suggests recommendations for educators and for further research. The thesis concludes with a final reflection by the researcher.

7.2: Brief Summary of the Study

This study sought to explore the relationship between literacy and technology in the early years of education. The purpose of the study was to gain insight into what the nexus between literacy centred practice and technology might look like in the practice of early years educators. The study was framed by the question, “*What are early years educators’ experiences of the relationship between technology and literacy in early years learning environments?*” In particular the study focused on the knowledge, understanding and pedagogical practice of educators and those involved in shaping the learning experiences of children in early learning environments.

Informed by literature themes relating to technology and literacy in learning, the researcher established the theoretical framework for the study by positioning it within contemporary understandings of the pedagogical approaches to technology and literacy. The study embraced both the pre-school (Kindergarten) early learning environment and that of the first year of primary education (Preparatory). The focus research question raised a series of issues relating to teacher mediation of technology in the literacy learning environment. Insights into the research question were sought initially through an investigation of the beliefs, understandings and assumptions about technology and literacy which early years educators bring with them to the learning environment. Secondly the study explored their understandings of the relationship between technology and literacy through an action-reflection model which focused on their practices and applications of technology to literacy learning in the early learning environment.

The study adopted a narrative methodology. Using an action-reflection cycle research design, the researcher was a participant observer in the learning spaces, walking beside the educators and observing and interviewing regularly over an extended period of time. The relationship between inquirer and participants was integral to capturing the rich complexity of the human experience. Case study was used to capture what was happening within the changing life space of the early learning environments. During the six month time frame of the data collection the lived experiences of participants were documented and recorded using a range of qualitative data collection methods including interviews, learning story journals, work samples, photographs and a researcher journal.

The exploration aimed at providing rich information about early years educators as mediators of technology in literacy programs. Educator beliefs, understandings and assumptions about technology and literacy practices were identified through the literature as having an influence on pedagogical practice. It was therefore important to determine the views of early years educator's in relation to these areas, in the authentic learning environment, and to consider how these understandings come into play in the early years learning environment. A further important aspect for consideration was the different ways in which early years educators interweave technology into the literacy program and, in turn, provide children with access to learning with, about and through technology.

The findings of the study indicated that whilst the early years educators worked in different learning environments, they commenced the study with similar levels of competence. Both used technology in prescriptive ways. Whilst each had a different view of literacy, they both concluded the data collection period with similar views of technology and literacy, and were using technology in holistic ways. The findings suggested that the action-reflection model may have contributed to their growth in understanding of the relationship between technology and literacy and to the change in their use of technology. The pedagogy of each educator was similar. They began by finding out as much as they could about the children's interests and needs and sought to arouse children's interest and curiosity. They then used this knowledge to immerse the children in information rich environments, providing access to flexible and customisable technology so that the technology came to the learning rather than the learning to the technology.

The early years learning environment thus became a community of learners: where children and teachers were learning with technology together and supported each other's learning between, across and within. Expectations for using technology in the literacy context were infused in the classroom practice so that the children's work with technology was reflected in their literacy development. Further, the findings from this study suggest that in the early years learning environment it was important for the educators to provide time for children's exploration of a singular form of technology entity, in different ways, over an extended period of time, in order to foster deep literacy learning.

Findings formed by the changed understandings and practices the early years educators had about technology and literacy from their participation in the action-reflection model, suggested the re-contextualising of Cambourne's (1995) conditions of learning. The study findings thus supported a re-contextualised Cambourne's (1995) conditions of learning and suggested a number of enhancements.

7.3: Addressing the Research Questions

The purpose of this research was to explore early years educators' experiences of the relationship between technology and literacy in early years learning environments. The overarching research question guiding the study was:

What are early years educators' experiences of the relationship between technology and literacy in early years learning environments?

This question raised a series of issues relating to teacher mediation of technology in the classroom. Insight into the research question was sought through an exploration of teacher beliefs, views and assumptions about literacy and technology, and through observation and investigation of their subsequent application of technology to the literacy context. Each of these entities was explored through two operational questions.

Research Operational Question 1: What are the beliefs, understandings and assumptions about technology, literacy practices that early years educators bring to the early years learning environment?

At the commencement of the study the two early years educator's held significantly different beliefs about literacy and technology. Susie communicated an holistic view of literacy (Cambourne & Turbill, 2007) and embraced technology as a communication device. However, Susie's descriptions of the use of technology in the kindergarten aligned more closely with prescriptive views of technology (Franklin, 1992), whereby children's use of the computer in the kindergarten was constrained to age-specific software games. Mollie's beliefs about literacy, on the other hand, were largely functional, with a program emphasis on paper-based and systematic methods of instruction. Her descriptions of technology application in the classroom could also be described as prescriptive and focussed upon using computers as a device for development of print and paper-based literacy skills.

Both early years educators self-identified as having an interest in using technology in the classroom and a reasonable skill and competence level with technology. Early years educator beliefs about, and views on, learning were similar in that they both expressed a view that it was important to engage children's interests in learning and to value the skills, knowledge and understanding that learners bring to the literacy learning context. Both educators expressed a belief that children learn from one another and a belief that classroom organisation and routines were important for learning. Furthermore, both expressed the view that there was a lack of professional learning opportunities

focussing on using technology creatively in ways that foster children's learning rather than simply for learning skills based content relating to particular software packages.

At the conclusion of the study the early years educators demonstrated shifts in their understanding of the relationship between literacy and technology with views more closely aligning with socio-cultural literacy and holistic technology perspectives following the ideas of Bigum and Green (1992). Throughout the study the educators were provided with opportunities to interrogate their beliefs about literacy, technology and learning and were supported by the researcher in their efforts to apply technology to the literacy context in new ways. Through these experiences they identified benefits for children's learning and illustrated these with the successes that were evident in their experiences. Their Learning Story Journals were strong motivators for their own continued professional learning and skill development. It seems likely that through the action-reflection cycles they could discuss, reflect on and evaluate beliefs, understandings and practice thus leading to the change in these beliefs and understandings about literacy, technology and learning.

Changed beliefs, communicated as a result of participation in the study, included the realisation by Mollie that she now felt competent in applying technology to the literacy context and could foster independence in the children's learning in keeping with the views of Freebody et al. (2008b). For Susie, it appeared to be through the application of holistic technology perspectives to practice that her beliefs about what children could do with technology changed. This was also the case for Mollie. Both early years educators considered that through a process and activity orientated approach to applying technology to the literacy context, children were seen to be capable learners who successfully carried out tasks using technology for themselves.

A key area of growth in the educators' understanding of the beneficial relationship between literacy and technology was related to the children using technology as a social vehicle. In both learning environments the educators initially expected that the children would use the technologies in an individualised way. In contrast, given the opportunity to explore with the technologies, the children gravitated towards social use (Edgar & Edgar, 2008).

The early years educators articulated an holistic approach to embedding technology throughout the learning environment at the end of the study. Mollie acknowledged a shift in her understanding from the planning of contrived learning experiences with technology to technology being "just part of what you do" (Mollie, C4, p. 7) and Susie planned to embrace technology in the kindergarten in her program in the following year. The educators in this study developed the understanding that it was important for young children to be in learning environments where experiences with technology are embedded within, and across, them (Downes, Arthur et al., 2001).

When early years educator beliefs and assumptions about technology, literacy and learning were aligned to holistic beliefs about technology and socio-cultural perspectives, the early years educators embraced the application of technology to the literacy context.

Research Sub-Question 2: How do early years educators interweave and mediate technology and literacy use by children in the early years of education?

Early years educators self-identified as having an interest in technology, but acknowledged that throughout the study they were challenged to push the boundaries of their own competence and confidence with technology. The action-reflection model used in the study enabled them to identify an area of need and to pursue professional learning within the context of their education community (Labbo, 2006), be it a stand-alone kindergarten or a school. The model further enabled them to explore a range of strategies aimed at providing meaningful learning experiences with technology in the literacy context.

As mediators of learning experiences with technology in their classrooms, the early years educators acknowledged the importance of providing meaningful and authentic learning opportunities for the children (Edgar & Edgar, 2008; Herrington, et al., 2010, Plowman, Stephen & McPake, 2008; Snyder, 2008). Susie decided to follow the children's interest in pursuing digital photography and she waited to see where the children's interest would take their learning. Mollie's application of technology, on the other hand, was driven by the school inquiry; *becoming a sustainable school*, which although imposed on the children, was largely determined by the children's interests, as it was related to the construction of the new school in which all children were extremely interested. In both learning environments children's interest and curiosity were aroused through the inquiry, in which technology was a part of, but not necessarily the primary motivation for, participation in learning.

A re-contextualised model of Cambourne's (1995) conditions of learning provided a lens through which to view the teaching and learning conditions present in each early years learning environment. Using this lens the study demonstrated that there are benefits in immersing children in information rich learning environments where paper based and multimodal resources are readily available and used by all. In the kindergarten this meant that children manipulated memory cards, used a printer, notebook computer, portable DVD player, CD player and digital photo frame. These children also integrated the technologies into their imaginative play in the home corner and other areas of the room. In the Preparatory classroom the children used reference books and the internet to search for factual information. They used the scanner, printer and various programs on the Macintosh notebooks to assist them as well as word banks and 'experts' in the classroom.

When technology was applied to the literacy context in this way, print and paper based literacies were embedded throughout the process. This was particularly evident in the Preparatory learning environment where children participated in a number of different projects where technology and print literacy skills were embedded throughout the process. The majority of learning activities in the preparatory classroom involved the children in talking with others about the experiences, planning and preparing drafts and reading work out loud for practise and critical feedback. In the kindergarten the way in which the children interacted using the technology involved talking with others about their

photographs, sharing ideas, organising others, helping others and expressing their ideas about technology through imaginative play. In both learning environment case studies an holistic approach to applying technology to the literacy context enabled learning on a continuum of reading, writing, listening, speaking and a range of broader technology practices to occur.

In the process–orientated approach, the early years educators communicated expectations associated with the use of technology. Others have highlighted the importance of realistic and achievable expectations for literacy (Comber, 2006; Loudon et al., 2005a) but this study suggests that expectations need to extend to children working and problem solving with technology. The study suggests that it is important for early years educators to allow children to experience the process of using technology in the literacy context; learning from mistakes and feeling the empowerment that comes from completing whole processes themselves.

The length of time that participating early years educators provided for children to explore with the technology seemed to be beneficial for learning. Susie chose to allow the children to explore with the digital camera for six months and introduced peripherals and other forms of technology such as the portable DVD player to the program during this time, but for most of the study, the children's inquiry stemmed from their explorations with the digital camera. Mollie chose to exploit the podcasting software, *Garage Band*, for the six months of the study. She tried some other options in between such as *Pages*, but for the most part the children spent their time using *Garage Band* software in different ways. The opportunity to spend an extended period of time using the one form of technology seemed to allow the children time to develop competence with the technology and to build a community of learners where children and early years educators felt comfortable working together using the technology. This study suggests that deep learning, which may be at the core of success in digital landscapes, may be fostered when children have time to explore with the one form of technology over extended periods of time. In this study early years educators began to observe literacy learning once children had been given time to develop competence with the technology and had moved beyond the novelty.

The accessibility of technology resources significantly impacted on the way that early years educators used technology in the literacy context of their learning environments. In both learning environments there were not enough resources for every child to have access to technology resources at the same time. The issue of children's access to the technology forced early years educators to plan for access in ways that would not only be equitable, but conducive to learning. In both learning environments this process was collaborative. It involved the children in being responsible for use of the resources and working together to help each other and to work collaboratively on projects. The children worked together to share resources, help each other and to create projects. The children were able to work collaboratively in a way where interruptions were minimised because the technology was customisable and flexible. The flexibility of the digital camera was tested again and again, with the kindergarten children exploring almost every function and still managing to control functionality and

use it for a range of different purposes, from a storytelling prop to an integral part in socio-dramatic play sequence.

Early years educator mediation of technology in each learning environment appeared to foster a learning community where resources and expertise were shared. As *experts* with technology began to emerge in each learning environment, so too the development of a learning community, and a transference of behaviours into other contexts was observed. Mollie and Susie encouraged children to support each other in their learning and the sharing of resources such as computers, I-Touches and digital cameras. This appeared to be accompanied by a sharing of knowledge across the three learning communities: school, out of school and ICT (Andrews, 2004a). In the kindergarten this was recognisable in the children's socio—dramatic play, where they were sending vet email messages, and in Ellie's drawing of Ellie.com. In the school learning environment the connections between the school and the community were strong with the visits to the new school site and the creation of school narratives that were then sent home to families via email and accessible via the school website. These children were accessing information from the internet for their projects, sending information to, and from, school via the internet and using the local library to supplement the inquiry and the construction of the new ecologically sustainable school. The way in which the early years educators encouraged collaboration within, and across, these learning communities appeared to be seamless and when others needed assistance with using technology, such as the kindergarten assistant or student teacher, children were willing to provide support. This study suggests that communities of collaboration can be conducive to a symbiosis of technology and literacy.

The notion of scaffolding is strongly embedded in contemporary views of literacy pedagogy. The early years educators found that scaffolding also extended to the application of technology to the literacy context. Although children were encouraged to explore with the technology and learn from their mistakes, the role of the early years educator as a guide in innovative practice was essential. In the kindergarten learning environment, Susie found herself carefully observing children's behaviours and interactions to decide when to add another layer of complexity to their explorations in the form of another memory card, a notebook computer, a digital photo frame or other peripheral device. For Mollie, it was most often in the form of modifying the activity so that all children could achieve success. It would seem that using technology in the literacy context required the early years educators to be avid *child watchers* as they interacted with, observed and supported children in their learning with technology. Both Susie and Mollie found themselves regularly modelling particular actions using technology, in a similar way to a modelled reading or writing session. Early years educators in both learning environments moved between providing explicit instruction and allowing the children to learn through their own explorations with the technology and interactions with others.

When the early years educators implemented activity-orientated approaches to applying technology to the literacy context, involving an emphasis on technology as part of the process rather than product, a seamless integration of technology to the literacy context seemed to be achieved.

Furthermore, with the early years educator in a facilitative role and engaging the children in using the one form of technology for an extended period of time, it would seem that learning may be fostered. Educator mediation of technology in the literacy learning environment encouraged learning to occur in collaborative learning communities, within and beyond classroom walls, as models for flexible use of technology catering for diverse needs through scaffolding methodology was explored.

7.4: The Early Years Educators' Experiences

Guiding Research Question: What are early years educators' experiences of technology and literacy in early years learning environments?

The findings of the current study demonstrated the complexities related to the use of technology for literacy learning in early years environments and the potential of the relationship between the two for learning.

Firstly, the study demonstrated that a pedagogical approach to teacher professional learning, enabled through the use of the action-reflection model within the methodology, fostered innovative practice and enabled educators to develop competence and confidence with new approaches alongside the children. Through the implementation of an intervention (action-reflection model) aimed at challenging the educators existing conceptions and building on their existing knowledge, professional learning experiences aligned closely with contemporary approaches occurring within an authentic context at each educator's perceived point of need (Edwards, 2009; Ingvarson et al., 2005; Labbo, 2006). Throughout the process the support provided by the researcher varied, shifting within and between roles of technical support, critical friend, collaborator and mentor. Fleet and Patterson (2009) described the role of facilitator in a similar way as 'knowledge-sharer' and 'people-supporter', but in this study the researcher as facilitator contributed not only to the professional growth of the educators but subsequently to their experiences of technology and literacy in their learning environments.

Secondly, the study found that holistic approaches to the application of technology in the literacy context supported through teacher professional learning, were conducive to children's learning and a process-approach was clearly recognisable in both contexts. This supports a view that a nexus between a critical-cultural literacy and holistic technology perspective is conducive to learning (Bigum & Green, 1992). Although the nexus achieved in this study was more closely aligned to socio-cultural literacy and holistic technology perspectives, this may be indicative of prevailing literacy paradigms in the early years and perhaps better explored in a further study.

Thirdly, the study found that in the application of holistic approaches to technology to the literacy context supported by teacher professional learning, the opportunity for children to explore and work with one form of technology (i.e. podcasts, digital camera) for an extended period of time provided opportunity to move beyond novelty and surface understanding of technology to literacy learning. Educators described depth and breadth in children's literacy learning after children had

sufficient time to develop competence and confidence with the technology. Once novelty lapsed and competence was established educators observed multimodal and paper based literacy learning embedded throughout the process. Also significant during this process was the need for children to be given opportunities to learn technology skills through explicit teaching and exploration of the technology in the literacy context in a collaborative learning environment.

Supported by the intervention, the early years educators in this study integrated technology into their practice in ways that fostered literacy learning. Educators used collaborative approaches to interweave technology into their learning environments. These approaches were child centred and process orientated, where the need for all children to have access to the technology at the same time was negated. Children worked in groups, pairs and individually using technology, and the need to be able to customise settings and programs to meet specific needs was significant. Johnson et al. (2009) highlighted a trend for group work and the use of customisable technology in relation to learning management systems. This study suggested that the application of technology in this way could be empowering for young learners as the responsibility for control over a range of functions shifts from teacher to learner.

Further, the early years educators reported that young children were strongly motivated by the social features of the technology and reported subsequent benefits for the children's learning. These benefits were described in relation to oral language and positive social behaviours. In particular, the educators described connections between children's interactions using technology and oral language, and children's engagement in language use stimulated from their experiences with technology which, in turn, fostered literacy learning in other areas, such as reading and writing. They further described children's positive social behaviours stimulated from working with technology, collaborative problem solving using the technology, technology experts assisting peers and adults, and the transfer of language associated with technology and technology-real or child-made into socio-dramatic play. A range of learning episodes showed children empowered through working together in collaborative learning environments which harness the social features of technology in group, solitary and paired tasks. These social features of technology for empowering learners have been recognised by other researchers (Brooker & Siraj-Blatchford, 2002; Carrington & Marsh, 2005; Downes, Arthur et al., 2001; Edwards, 2005; Edwards et al., 2010; Marsh, 2005; Siraj-Blatchford & Whitebread, 2003; Walsh, 2010, 2011) and supported by this study.

Finally, this study found that young children interacted in and across the three learning communities described by Andrews (2004a). This interaction was recognised through meaningful opportunities for children to engage in socially important, action-orientated experiences with technology, as connections were made between out-of-formal education and formal education experiences. This interaction was further recognised in learning episodes where technology was used to connect with the wider community, or to bring knowledge from the global community into the

learning environment, or where opportunities for new learning to be applied to other literacy contexts was provided.

The experiences of the educators involved in this study have informed the re-contextualised model of Cambourne's (1995) conditions of learning. The conditions of learning are richly embedded in the experience of the educators and the holistic approaches to technology applied to the literacy context. What is needed next it would seem is consideration of the implications that this model may have for educator practice. The next section considers recommendations arising from the study in relation to professional learning, pedagogy and the re-contextualised model.

7.4: Recommendations Arising from the Study

Recommendations stemming from the findings of this study relate specifically to those working in the field of early years education. The following section outlines three major recommendations for educators. The chapter concludes with some recommendations for further research stemming from the study and a final reflection from the researcher.

7.4.1: Recommendations for Educators

From the findings of this study the foundations for the future should embrace holistic approaches to the application of technology to the literacy context, in which a focus on a single form of technology for an extended period of time is a major consideration. An extended focus on a singular form of technology (e.g. podcasts) is deemed important to explore the depths of the potential of technology for literacy learning. Thus, it is a recommendation from this study that process orientated, child centred approaches to technology and literacy aimed at establishing strong active, social connections for children are employed, in order for children's work with, and through, technology to be reflected in their literacy development.

A second recommendation stemming from this study relates to professional learning. The narrative approach based on an action-reflection model used in this study, which captures teachers' stories, fosters appropriate pedagogy for the application of technology to the literacy context. It is recommended that early years educators be given regular professional learning opportunities to actively engage in narrative or story development, reflecting on their own practice. Further, a critical factor in early childhood professional learning identified by Edwards (2009) is "time to absorb new ideas" (p. 85) and to explore these ideas in practice. From this study it is recommended that educators are provided appropriate time, and are supported in exploring these ideas in practice by a mentor who walks with them on their journey. This study has found that the learning environments were dynamic learning communities of collaboration and cooperation. Thus, it is recommended that a mentor working with educators is a professional with the flexibility to move between and across the roles of critical friend, technical expert, collaborator and co-learner.

The final recommendation from this study highlights the significance of the re-contextualised model of Cambourne's (1995) conditions of learning for early years learning in the 21st century. The re-contextualised model takes into consideration changing social literacy and technology practices, and incorporates consideration of engagement in learning within and across the learning communities of school/pre-school, home/community and ICT. The placement of *knowing the child* at the centre of the model (see *Figure 6.2*) is significant because it encourages educators to consider the "traditional pedagogic practices of families" (Brooker, 2011, p. 144) alongside children's interests and needs in the learning community, when planning for literacy learning. It is recommended that educators be supported in exploring and understanding models of literacy learning, such as the re-contextualised Cambourne's (1995) conditions of learning, which incorporate consideration of the relationship between technology and literacy for 21st century early years learning, to improve educator practice.

7.4.2: Recommendations for Further Research

Following on from this research, there is a need for further research to explore the application of the re-contextualised model of Cambourne's (1995) conditions of learning to educator practice. As technology and literacy continue to evolve it is imperative that further research occurs to ensure that the model remains organic and continues to develop in ways that are encompassing of elements of the changing social and technological context.

This study suggested that there was merit in using a LSJ for teacher professional learning. The model adapted from Carr's (2001) Learning Stories used in early childhood assisted the early years educators to focus on good practice and replicate this practice in other literacy contexts. The application of a modified LSJ with further multimodal functionality is worthy of further investigation. It is recommended that further exploration of the re-contextualised model of Cambourne's (1995) conditions of learning be carried out using an educator LSJ incorporating the multimodal functionality of the I-pad for capturing critical incidents.

A longitudinal study is recommended as sustainability of practice over time is important. This study does not provide information to determine if early years educators continued to apply the strategies for teaching and learning used in this study. It is important to find out if practice was sustained over time and when a new group of children arrived.

7.5: Final Reflection

The experience of walking alongside each early years educator as they applied technology to the literacy context has been an extremely rewarding one. I wondered when the data collection process was completed and the new education year commenced whether Susie and Mollie would continue to move forward in their understandings of the relationship between technology and literacy, and embrace holistic approaches to technology and literacy in their learning environments. Although my intervention ceased after the study I have continued to maintain regular contact with both educators,

and it is extremely gratifying to observe their continued commitment to holistic approaches to technology and literacy, and to their leadership in this area in their respective communities. Susie continues to live up to her reputation as 'Gadget Girl' and her kindergarten now has a 'real' electronic whiteboard, four I-pads, and an I-pod with a docking station, all of which are used by the children in ways that were encouraged through her involvement in this study. In addition, Susie is a member of the regional kindergarten association, and her leadership in pedagogy associated with the integration of technology is recognised and acknowledged through frequent visits to her kindergarten by colleagues eager to gain insight into what a technology infused kindergarten learning environment looks like. The school population at Mollie's school has grown from twenty three to one hundred and fifty. Mollie continues to work in the Preparatory area of the school using technology in ways that she was introduced to through her involvement in this study. She is now the technology coordinator. One of Mollie's key goals, working with an increasing number of staff members, is to work with staff to develop holistic approaches to technology and literacy in ways which build upon her experiences in this study.

In a recent conversation with some early years educators about the findings of this study, they indicated that they know of, and understand, Cambourne's (1995) conditions of learning and that they understand story. They indicated that it is technology they are not sure about. If Cambourne's re-contextualised model, story and technology are brought together in the professional learning experience of educators, then perhaps the symbiosis of technology and literacy may be fully realised in early years learning environments.

From my perspective as a researcher, it almost seems like the fairy-tale ending, but in a world where social literacy and technology practices continue to change, the application of the re-contextualised model of Cambourne's (1995) conditions of learning would appear to be the next chapter in a continuing story.

REFERENCES

- Abasi, A. R., & Taylor, M. C. (2007). Tackling the issues and challenges of using video data in adult literacy research. *Australian Journal of Adult Learning*, 47(2), 289-307
- Andrews, R. (2003). ICT and Literacies: A new kind of research is needed. *Literacy Learning in the Middle Years*, 11(1), 9-12.
- Andrews, R. (Ed.). (2004a). *The impact of ICT on literacy education*. London: Routledge Farmer.
- Andrews, R. (2004b). Where next in research on ICT and literacies? *English in Australia*, (139), 58-67.
- Anning, A. (2005). Play and legislated curriculum. Back to the basics: An alternative view. In J.R. Moyles (Ed.), *Excellence of play* (2nd ed., pp. 15-26). Berkshire, GBR: McGraw-Hill Education.
- Anstey, M., & Bull, G. (2007). *Teaching and learning multiliteracies: Changing times, changing literacies*. Newark, DE: International Reading Association.
- Anstey, M., & Bull, G. (2010). Helping teachers to explore multimodal texts. *Curriculum Leadership Journal*, 8(16), 1-5
- Arthur, L. (2001). Young children as critical consumers. *The Australian Journal of Language and Literacy*, 24(3), 182-194.
- Australian Curriculum Assessment and Reporting Authority [ACARA]. (2011). The Australian curriculum: English. Retrieved June 20, 2011 from ACARA website: <http://www.australiancurriculum.edu.au/Home>.
- Banks, M. (2001). *Visual methods in social research*. London, GBR: Sage Publications Ltd
- Barone, D. M. (2011). Case study research. In N. K. Duke (Ed.), *Literacy research methodologies*. (pp. 7-27). New York, NY: Guilford Press.
- Bearne, E. (2009). Multimodality, literacy and texts: Developing a discourse. *Journal of Early Childhood Literacy*, 9(2), 156-187
- Bearne, E., & Wolstencroft, H. (2006). Playing with texts: The contribution of children's knowledge of computer narratives to their story-writing. In J. Marsh & E. Millard (Eds.), *Popular literacies, childhood and schooling* (pp. 72-92). Oxon: Routledge.
- Beavis, C. (2001). Digital culture, digital literacies: Expanding notions of text. In C. Durrant & C. Beavis (Eds.), *P(ICT)ures of English: Teachers, learners and technology* (pp. 145-161). Kent Town, SA: Wakefield Press.
- Beavis, C. (2002). Reading, writing and roleplaying computer games. In I. Snyder (Ed.), *Silicon Literacies* (pp. 47-61). London: Routledge.
- Beavis, C. (2003). Critical engagement: ICTs, literacy and curriculum. *Practically Primary*, 8(1), 39-44.
- Beecher, B., & Arthur, L. (2001). *Play and literacy in children's worlds*. Newtown, N.S.W: Primary English Teaching Association.
- Biggs, J. (2003). *Teaching for quality learning at university: What the student does*. (2nd ed.). Berkshire: Society for Research into Higher Education & Open University Press.

- Bigum, C. (2002). Design sensibilities, schools and the new computing and communication technologies. In I. Snyder (Ed.), *Silicon literacies: Communication, innovation and education in the electronic age* (pp. 130-140). London: Routledge.
- Bigum, C., & Green, B. (1992). Technologizing literacy: The dark side of dreaming. *Discourse*, 12(2), 4-28.
- Brooker, L. (2003). Integrating new technologies in UK classrooms: Lessons for teachers from early years practitioners. *Childhood Education*, 79(5), 261-267.
- Brooker, L. (2008). *Supporting transitions in the early years*. Berkshire, GBR: Open University Press.
- Brooker, L. (2010). Learning to play, or playing to learn? Children's participation in the cultures of homes and settings. In L. Brooker & S. Edwards (Eds.), *Engaging play* (pp. 39-53). Maidenhead: McGraw-Hill
- Brooker, L. (2011). Taking children seriously: An alternative agenda for research. *Journal of Early Childhood Research*, 9 (2), 137-149.
- Brooker, L., & Siraj-Blatchford, J. (2002). "Click on Miaow": How children of three and four years experience the nursery computer. *Contemporary Issues in Early Childhood*, 3(2), 251-273.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.
- Bruce, B. C., & Bishop, A. P. (2008). New literacies and community inquiry. In J. Coiro, M. Knobel, C. Lankshear & D. J. Leu (Eds.), *Handbook of research on new literacies* (pp. 699-742). New York, NY: Routledge Taylor & Francis Group.
- Burns, R. (2000). *Introduction to research methods* (4th ed.). Frenchs Forest: Pearson Education Australia Pty Ltd.
- Cambourne, B. (1988). *The whole story: Natural learning and the acquisition of literacy in the classroom*. Auckland, NZ: Ashton Scholastic Limited.
- Cambourne, B. (1989). Look what they've done to my song, Ma: A reply to Luke, Baty and Stephens. *English in Australia* (90), 13-22.
- Cambourne, B. (1995). Toward an educationally relevant theory of literacy learning: Twenty years of inquiry. *The Reading Teacher*, 49(3), 182-190.
- Cambourne, B. (2000). Conditions for literacy learning. Turning learning theory into classroom instruction: A minicase study. *The Reading Teacher*, 54(4), 414-417.
- Cambourne, B. (2002). The conditions of learning: is learning natural? *The Reading Teacher*, 55(8), 758-762.
- Cambourne, B. (2003). Taking a naturalistic viewpoint in early childhood literacy research. In N. Hall, J. Larson & J. Marsh (Eds.), *Handbook of early childhood literacy* (pp. 411-423). London: Sage Publications.
- Cambourne, B. (2005). Once more into the breach: phonics and reading in Australia. *English in Australia*, (144), 4-9.

- Cambourne, B., & Turbill, J. (2007). Looking back to look forward: Understanding the present by revisiting the past: An Australian perspective. *International Journal of Progressive Education*, 3(2), 8-29.
- Carr, M. (2001). *Assessment in early childhood settings: Learning stories*. London: Paul Chapman.
- Carrington, V. (2001). Emergent home literacies: A challenge for educators. *The Australian Journal of Language and Literacy*, 24(2), 88-100.
- Carrington, V., & Marsh, J. (2005). Digital childhood and youth: New texts, new literacies. *Discourse: Studies in the Cultural Politics of Education*, 26(3), 279-285.
- Chase, S. E. (2005). Narrative inquiry: Multiple lenses, approaches, voices. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 651-679). Thousand Oaks, California: Sage Publications Inc.
- Clay, M. (1993a). *An observation survey of early literacy achievement*. Auckland, NZ: Heinemann.
- Clay, M. (1993b). *Reading recovery: A guide book for teachers in training*. Auckland, N.Z: Heinemann.
- Clay, M. (1998). *By different paths to common outcomes*. Maine: Stenhouse Publishers.
- Cochran-Smith, M., & Lytle, S. L. (1990). Research on teaching and teacher research: The issues that divide. *Educational Researcher*, 19(2), 2-11.
- Coiro, J. (2005). Every teacher a Mrs Rumphis: Empowering teachers with effective professional development. In R. A. Karchmar, M. H. Mallette, J. Kara-Soteriou & D. J. Leu (Eds.), *Innovative approaches to literacy education: Using the internet to support new literacies* (pp. 199-219). Newark, DE: International Reading Association.
- Comber, B. (2001). Critical literacy: Power and pleasure with language in the early years. *The Australian Journal of Language and Literacy*, 24(3), 168-181.
- Comber, B. (2006). Pedagogy as work: Educating the next generation of literacy teachers. *Pedagogies: An International Journal*, 1(1), 59-67.
- Comber, B., Nixon, H., & Reid, J. (Eds.). (2007a). *Literacies in place: Teaching environmental communications*. Newtown, NSW: Primary English Teaching Association.
- Comber, B., Nixon, H. & Reid, J., (2007b). Environmental communications: pedagogies for responsibility and place. In B. Comber, J. Reid & H. Nixon (Eds.), *Literacies in place: Teaching environmental communications* (pp. 11-23). Newtown, NSW: Primary English Teaching Association.
- Comber, B., & Reid, J. (2006). Literacy education: What's new and what needs to be new? In B. Doecke, M. Howie & W. Sawyer (Eds.), *Only connect: English teaching, school and community* (pp. 335-348). Kent Town, SA: Wakefield Press.
- Comber, B., & Reid, J. (2007). Understanding literacy pedagogy in and out of school. In L. Makin, C. Jones Diaz & C. McLachlan (Eds.), *Literacies in early childhood: Changing views, challenging practice* (2nd ed., pp. 43-56). Marrickville, N.S.W.: Elsevier.
- Committee for the National Inquiry into the Teaching of Literacy. (2005). *Teaching reading: Report and recommendations*. Retrieved July 15, 2008 from DEST website: http://www.dest.gov.au/nitl/documents/report_recommendations.pdf.

- Connelly, F. M., & Clandinin, D. J. (2006). Narrative inquiry. In J. L. Green, G. Camilli & P. B. Elmore (Eds.), *Handbook of complementary methods in education research* (pp.477-487) Mahwah, NJ: Erlbaum.
- Cope, B., & Kalantzis, M. (Eds.). (2000). *Multiliteracies: Literacy learning and the design of social futures*. South Yarra, VIC: Macmillan.
- Coulter, C. A., & Smith, M. L. (2007). The construction zone: Literary elements in narrative research. *Educational Researcher*, 38(8), 577-590.
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W. (2007). *Qualitative inquiry and research design* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Crevola, C. A., & Hill, P. W. (2005). *The children's literacy success strategy (CLaSS): A research report on the first six years of a large-scale reform initiative*. East Melbourne: Catholic Education Commission of Victoria (CECV).
- Dalton, B., & Proctor, C. P. (2008). The changing landscape of text and comprehension in the age of new literacies. In J. Coiro, M. Knobel, C. Lanksher & D. J. Leu (Eds.), *Handbook of research on new literacies* (pp. 297-324). New York, NY: Routledge Taylor and Francis Group.
- Darling-Hammond, L. (2003). Keeping good teachers: Why it matters, what leaders can do. *Educational Leadership*, 60(8), 6-13
- Degotardi, S., & Pearson, E. (2010). Knowing me, knowing you: The relationship dynamics of infant play. In M. Ebbeck & M. Waniganayake (Eds.), *Play in early childhood education: learning in diverse contexts* (pp.46-65). Melbourne: Oxford University Press.
- Denzin, N. K., & Lincoln, Y. S. (2005). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage book of qualitative research*. (3rd ed., pp. 1-32). Thousand Oaks, CA: Sage Publications.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (2000). *Handbook of qualitative research* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Department of Education and Early Childhood Development [DEECD]. (2009). *Victorian early years learning and development framework: For all children from birth to eight years*. Melbourne, VIC: Early Childhood Strategy Division, Department of Education and Early Childhood Development, and Victorian Curriculum Assessment Authority
- Department of Education Employment and Workplace Relations for the Council of Australian Governments. (2009). *Belonging, being and becoming: The early years learning framework for Australia*. Retrieved June 20, 2011 from DEEWR website: http://www.deewr.gov.au/Earlychildhood/Policy_Agenda/Quality/Documents/Final%20EYLF%20Framework%20Report%20-%20WEB.pdf.
- Derry, S. J., Pea, R. D., Barron, B., Engle, R. A., Erickson, F., Goldman, R., et al. (2010). Videoing research in the learning sciences. *The Journal of the Learning Sciences*, 19, 3-53.
- Downes, T., Arthur, L., & Beecher, B. (2001). Effective learning environments for young children using digital resources: An Australian perspective. *Information Technology in Childhood Education Annual*, 1, 139-153.

- Downes, T., Fluck, A., Gibbons, P., Leonard, R., Matthews, C., Oliver, R., et al. (2001). Making better connections : Models of teacher professional development for the integration of information and communication technology into classroom practice. Retrieved June16, 2007 from DEEWR website:
<http://www.dest.gov.au/archive/schools/publications/2002/MBC.pdf>
- Dressman, M., & McCarthy, S. J. (2011). Toward a pragmatics of epistemology, methodology and social theory. In N. K. Duke (Ed.), *Literacy research methodologies* (pp. 441-471). New York, NY: Guilford Press.
- Driver, R., Asoko, H., Leach, J., Mortimer, E., & Scott, P. (1994). Constructing scientific knowledge in the classroom. *Educational Researcher*, 23(7), 5-12.
- Durrant, C. (2001). Peripherals to motherboard: Stories of ICT and English in Australia in the 1980s. In C. Durrant & C. Beavis (Eds.), *P(ict)ures of English: Teachers, learners and technology* (pp. 13-31). Kent Town: Wakefield Press.
- Durrant, C., & Beavis, C. (2001). A p(ICT)ure is worth. In C. Durrant, & Beavis, C. (Ed.), *P(ICT)ures of English: Teachers, learners and technology* (pp. 1-11). Kent Town: Wakefield Press.
- Durrant, C., & Green, B. (2000). Literacy and the new technologies in school education: Meeting the l(IT)eracy challenge? *The Australian Journal of Language and Literacy*, 23(2), 89-108.
- Early Years of Schooling Branch of the Department of Education Employment and Training. (1999). *Early years literacy program*. South Melbourne, VIC: Addison Wesley Longman Australia
- Ebbeck, M., & Waniganayake, M. (2010). Perspectives of play in a changing world. In M. Ebbeck & M. Waniganayake (Eds.), *Play in early childhood education: Learning in diverse contexts* (pp.5-24) Melbourne, VIC: Oxford University Press.
- Edgar, D., & Edgar, P. (2008). *The new child: In search of smarter grown ups*. Melbourne, VIC: Wilkinson Publishing Pty Ltd.
- Edwards, S. (2005). The reasoning behind the scene: Why do early childhood educators use computers in their classrooms? *Australian Journal of Early Childhood*, 30(4), 25-33.
- Edwards, S. (2009). Beyond developmentalism. In S. Edwards & J. Nuttall (Eds.), *Professional learning in early childhood settings* (pp. 81-95). Rotterdam, The Netherlands: Sense Publishers.
- Edwards, S., Henderson, M., & Mirkhil, M. (2010). *Everyday learning about screen time and digital technologies*. Deakin West, ACT: Early Childhood Australia.
- Elkind, D. (2007). *The power of play: How spontaneous, imaginative activities lead to healthier, happier children*. Cambridge, UK: Da Capo Press.
- Elliott, A. (2010). Play and literacy pedagogies for preschool and early years settings. In M. Ebbeck & M. Waniganayake (Eds.), *Play in early childhood education: Learning in diverse contexts*. (pp. 67-88). Melbourne, VIC: Oxford University Press.
- Emmitt, M., Zbaracki, M., Komesaroff, L., & Pollock, J. (2010). *Language and learning: An introduction for teaching* (5th ed.). Melbourne, VIC: Oxford University Press.
- Exley, B. (2008). Communities of learners: Early years students, new learning pedagogy and transformations. In A. Healy (Ed.), *Multiliteracies and diversity in education: New pedagogies for expanding landscapes* (pp. 126-144). South Melbourne, VIC: Oxford University Press.

- Fleer, M. (2004). Sociocultural constructions of technology education: Building conceptual tools. *Learning Matters*, 9(1), 3-7.
- Fleet, A., & Patterson, C. (2009). A timescape. In S. Edwards & J. Nuttall (Eds.), *Professional learning in early childhood settings* (pp. 9-25). Rotterdam, The Netherlands: Sense Publishers.
- Fontana, A., & Frey, J. (2000). The interview: From structured questions to negotiated text. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 645-672). Thousand Oaks: Sage Publications.
- Franklin, U. (1992). *The real world of technology*. Ontario, Canada: House of Anansi Press Limited.
- Freebody, P. (2004). Foreword. In A. Healy & E. Honan (Eds.), *Text next: New resources for literacy learning* (pp. 3-17). Newtown, N.S.W.: Primary English Teaching Association.
- Freebody, P., Reinmann, P., & Tiu, A. (2008a). *Alignment of perceptions about the use of ICT in Australian and New Zealand schools: Improving the uptake of ICT in schools*. Retrieved April 6, 2009 from Learning Federation website:
http://www.thelearningfederation.edu.au/verve/resources/Improving_the_uptake_of_ICT_in_schools_1.pdf
- Freebody, P., Reinmann, P., & Tiu, A. (2008b). *Alignment of perceptions about the uses of ICT in Australian and New Zealand schools: Brief review of research literature on the benefits of ICT use in school*. Retrieved April 6, 2009 from Learning Federation website:
http://www.thelearningfederation.edu.au/verve/resources/Improving_the_uptake_of_ICT_in_schools_2.pdf
- Freeman, J., & Somerindyke, J. (2001). Social play at the computer: Preschoolers scaffold and support peers' computer competence. *Information Technology in Childhood Education Annual*, 1, 203-213.
- Freire, P. (1972). *Pedagogy of the oppressed*. London: Sheed of Ward.
- Fullen, M., Hill, P., & Crevola, C. (2006). *Breakthrough*. Thousand Oaks, California: Sage Publications.
- Gannon, S., & Sawyer, W. (2007). "Whole language and moral panic in Australia. *International Journal of Progressive Education*, 3(2), 30-51.
- Garton, A. (2004). *Exploring cognitive development: The child as problem solver*. Malden, MA: Blackwell Publishing Ltd.
- Gee, J. P. (1993). Postmodernism and literacies. In C. Lankshear & P. McLaren (Eds.), *Critical literacy: politics, praxis and the postmodern* (pp. 271-295). New York: State University of New York Press.
- Gee, J.P. (1997). Foreward: A Discourse approach to language and literacy. In C. Lankshear with J.P. Gee, M. Knobel & C. Searle, *Changing literacies* (pp. xiii-xix). Buckingham, UK: Open University Press
- Gee, J. P. (1999). *Introduction to discourse analysis: Theory and method*. Retrieved from Ebrary database.
- Gee, J. P. (2003). *What video games have to teach us about learning and literacy* . Retrieved from Ebrary database.
- Gee, J. P. (2010). A situated socio-cultural approach to literacy and technology. In E. A. Baker (Ed.), *The new literacies: Multiple perspectives on research and practice*. (pp. 165-194). New York, NY: The Guilford Press.

- Goldberg, A., Russell, M., & Cook, M. (2003). The effects of computers on student writing: A meta-analysis of studies from 1992-2002. *Journal of Technology, Learning and Assessment*, 2(1), 1-24.
- Goodman, K. S. (1989). Whole language research: Foundations and development. *The Elementary School Journal*, 90(2), 207-221.
- Goodwyn, A. (2001). Complex citizens or citizens with a complex: Cultural rights in the convergence. In C. Durrant & C. Beavis (Eds.), *P(ict)ures of English: Teachers, learners and technology* (pp. 52-67). Kent Town: Wakefield Press.
- Gordon, E., McKibbin, K., Vasudevaqn, L., & Vinz, R. (2007). Writing out of the unexpected: Narrative inquiry and the weight of small moments. *English Education*, 39(4), 326-351.
- Graves, D. (1983). *Writing: Teachers and children at work*. Exeter, NH: Heinemann Educational Books.
- Green, B., & Bigum, C. (1993). Aliens in the classroom. *Australian Journal of Education*, 37(2), 119-141.
- Griffith, K., & Kowalski, H. (2010). *Dictionary of educational terms*. South Melbourne, VIC: Oxford University Press.
- Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology*, 29(2), 75-91.
- Halliday, M. A. K. (1984). Three aspects of children's language development: Learning language, learning through language, and learning about language. In Y. M. Goodman, M. Haussler & D. Strickland (Eds.), *Oral and written language development research: Impact on the schools* (pp. 165-192). Urbana, IL: National Council of Teachers of English.
- Hargreaves, D. (2005). *Personalising learning - 3: Learn to learn and the new technologies* Retrieved August 12, 2010 from iNet website:
<http://www.sst-inet.net/resources/publications/publicationdescriptions/personalisinglearningseries1.aspx>
- Harris, P., Turbill, J., Fitzsimmons, P., & McKenzie, B. (2001). *Reading in the primary school years*. Sydney, NSW: Social Science Press.
- Healy, A. (2004). The critical heart of multiliteracies: Four resources, multimodal texts and classroom practice. In A. Healy & E. Honan (Eds.), *Text next: New resources for literacy learning*. (pp. 19-36) Newtown, NSW: Primary English Teaching Association.
- Healy, A. (2008). Expanding student capacities: Learning by design pedagogy. In A. Healy (Ed.), *Multiliteracies and diversity in education: New pedagogies for expanding landscapes* (pp. 2-29). Melbourne: Oxford University Press.
- Healy, A., & Dooley, K. (2002). Digital reading pedagogy for novice readers. Paper presented at the AARE Conference, December 2-5. Retrieved from ERIC database.
- Hedges, H. (2000). Teaching in early childhood: Time to merge constructivist views so lerning through play equals teaching through play. *Australian Journal of Early Childhood*, 25 (4), 16-21.
- Hedges, H. (2010). Whose goals and interests? The interface of children's play and teachers' pedagogical practices. In L. Brooker & S. Edwards (Eds.), *Engaging play* (pp. 25-38). Maidenhead: McGraw-Hill.

- Herrington, J., Reeves, T. C., & Oliver, R. (2010). *A guide to authentic e-learning*. New York, NY: Routledge.
- Hill, P. W., & Crevola, C. A. (1998). *Key features of a whole-school, design approach to literacy teaching in schools*. Melbourne, VIC.: Department of Education and The University of Melbourne.
- Hill, S. (2004). Privileged literacy in preschool. *Australian Journal of Language and Literacy*, 27(2), 159-171.
- Hill, S. (2006). *Developing early literacy: Assessment and teaching*. Prahran, Vic.: Eleanor Curtain Publishing.
- Hill, S. (2007). Multiliteracies: Towards the future. In L. Makin, C. Jones Diaz & C. McLachlan (Eds.), *Literacies in childhood: Changing views, changing practice* (2nd ed., pp. 56-71). Merrickville, N.S.W.: Elsevier.
- Hill, S. (2010). The millennium generation: Teacher-researchers exploring new forms of literacy. *Journal of Early Childhood Literacy*, 10(3), 314-340.
- Hill, S., Comber, B., Loudon, W., Reid, J., & Rivalland, J. (2002). *100 children turn 10: a longitudinal study of literacy development from the year prior to school to the first 4 years of school*. (Vol. 1-2). Canberra, ACT: Department of Science, Education and Training.
- Hill, S., Yelland, N., & Thelning, K. (2004). *Mapping multiliteracies Children of the new millennium: Report of the research project 2002-2004*. Retrieved December 2, 2010 from Department of Education and Children's Services South Australia Website: http://www.earlyyears.sa.edu.au/pages/ProjectArchive/ICT_young_children/?reFlag=1
- Holdaway, D. (1979). *The foundations of literacy*. Sydney: Ashton-Scholastic.
- Howard, A., & Walsh, A. (2005). *Mercy and justice shall meet: Fraynetwork, digital storytelling: Fraynetwork*.
- Ingvarson, L., Meiers, M., & Beavis, A. (2005). Factors affecting the impact of professional development programs on teachers' knowledge, practice, student outcomes and efficacy. *Education Analysis Archives*, 13(10), 1-28.
- Johnson, I., Levine, A., Smith, R., Smythe, T., & Stone, S. (2009). *Horizon report, 2009 Australia-New Zealand edition*. Austin, Texas: The New Media Consortium.
- Jonassen, D., Howland, J., Marra, R.M., Crismond, D. (2008). *Meaningful learning with technology* (3rd ed.). New Jersey: Pearson
- Jones, M., & McLean, K. (2006). *Strategic partnerships in ICT Learning - a model of professional development shifting the focus of ICT as a vehicle for learning*. Paper presented at the IT's up here for thinking, Cairns, Australian Council for Computers in Education (ACCE).
- Kalantzis, M., Cope, B., & Cloonan, M. (2010). A multiliteracies perspective on the new literacies. In E. A. Baker (Ed.), *The new literacies: Multiple perspectives on research and practice* (pp. 61-88). New York, USA: The Guilford Press.
- Kalantzis, M., Cope, B., & Harvey, A. (2003). Assessing multiliteracies and the new basics. *Assessment in Education*, 10(1), 15-26.

- Kalantzis, M., Cope, B., & The Learning by Design Group. (2005). *Learning by design*. Melbourne: Victorian Schools Innovation Commission in association with Common Ground Publishing Pty Ltd.
- Keamy, K., Nicholas, H., Mahar, S., & Herrick, C. (2007). *Personalising education: From research to policy to practice*. (11). Retrieved May 29, 2009 from Department of Education and Early Childhood Development website:
<http://www.education.vic.gov.au/studentlearning/research/researchpublications.htm>
- Kellner, D. (1998). Multiple literacies and critical pedagogy in a multicultural society. *Education Theory*, 48(1), 103-122.
- Kellner, D. (2002). Technological revolution, multiple literacies and the restructuring of education. In I. Snyder (Ed.), *Silicon literacies: Communication, innovation and education in the electronic age* (pp. 154-169). London: Routledge.
- Kennedy, A., & Surman, L. (2007). Literacy transitions. In L. Makin, C. Jones Diaz & C. McLachlan (Eds.), *Literacies in childhood: Changing views, changing practice* (2nd ed., pp. 104-117). Merrickville, N.S.W.: Elsevier.
- Knobel, M. (2006). Technokids, Koala trouble and Pokemon: Literacy, new technologies and popular culture in children's everyday lives. In J. Marsh & E. Millard (Eds.), *Popular literacies, childhood and schooling* (pp. 11-28). Oxen: Routledge.
- Kress, G. (2000). Design and transformation: New theories and meaning. In B. Cope & M. Kalantzis (Eds.), *Multiliteracies: Literacy learning and the design of social futures* (pp. 153-181). South Yarra: Macmillan Publishers Australia Pty Ltd.
- Kress, G. (2006a). A continuing project: English for a period of radical instability. In B. Doecke, M. Howie & W. Sawyer (Eds.), *Only Connect* (pp. 27-30). Kent Town: Wakefield Press.
- Kress, G. (2006b). Reimagining English: Curriculum, identity and productive futures. In B. Doecke, M. Howie & W. Sawyer (Eds.), *Only Connect* (pp. 31-41). Kent Town: Wakefield Press.
- Kvale, S. (1996). *InterViews: An introduction to qualitative research interviewing*. Thousand Oaks: Sage Publications.
- Labbo, L. D. (2006). Literacy pedagogy and computer technologies: Toward solving the puzzle of current and future classroom practices. *Australian Journal of Language and Literacy*, 29(3), 199-209.
- Labbo, L. D., & Place, K. (2010). Fresh perspectives on new literacies and technology integration. *Voices from the Middle*, 17(3), 9-18.
- Labbo, L. D., & Reinking, D. (2003). Computers and early literacy education. In N. Hall, J. Larson & J. Marsh (Eds.), *Handbook of early literacy education* (pp. 338-354). London Sage.
- Labbo, L. D., & Ryan, T. (2010). Traversing the "literacies" landscape: A semiotic perspective on early literacy acquisition and digital literacies instruction. In E. A. Baker (Ed.), *The new literacies: Multiple perspectives on research and practice* (pp. 88-105). New York, USA: The Guilford Press.
- Lankshear, C., & Knobel, M. (1997a). Different worlds? Technology-mediated classroom learning and students' social practices with new technologies in home and community settings. In C. Lankshear, with, J. P. Gee, M. Knobel & C. Searle, *Changing literacies* (pp. 164-190). Buckingham: Open University Press.

- Lankshear, C., & Knobel, M. (1997b). Literacies, texts and difference in the electronic age. In C. Lankshear, with, J. P. Gee, M. Knobel & C. Searle, *Changing literacies* (pp. 133-163). Buckingham: Open University Press.
- Lankshear, C., & Knobel, M. (2003). New technologies in early childhood literacy research: A review of research. *Journal of Early Childhood Literacy*, 3(1), 59-82.
- Lankshear, C., & Knobel, M. (2006). *New literacies: Everyday practices and classroom learning* (2nd ed.). Berkshire, England: Open University Press.
- Lankshear, C., & Snyder, I., with Green, B. (2000). *Teachers and technoliteracy: Managing literacy, technology and learning in Schools*. St Leonards: Allen and Unwin.
- Lankshear, C., with Gee, J. P., Knobel, M., & Searle, C. (1997). *Changing literacies*. Buckingham, UK: Open University Press.
- Leadbeater, C. (2005). Focusing on the big things: Leading personalised learning in schools: *Helping Individuals Grow*. Retrieved September 13, 2010 from National College for School Leadership website: <http://www.nationalcollege.org.uk>
- Lichtman, M. (2006). *Qualitative research in education: A user's guide*. Thousand Oaks: Sage Publications Inc.
- Lincoln, Y., & Guba, E. (2000). Paradigmatic controversies, contradictions and emerging confluences. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp.163-188). Thousand Oaks: Sage Publications.
- Locke, T., & Andrews, R. (2004). ICT and literature: A Faustian compact. In R. Andrews (Ed.), *The impact of ICT on literacy education* (pp. 124-152). London: Routledge Falmer
- Lodico, M. G., Spaulding, D. T., & Voegtler, K. H. (2010). *Methods in educational research: From theory to practice*. Retrieved from Ebook Library database.
- Louden, W., Rohl, M., Barratt-Pugh, C., Brown, C., Cairney, T., Elderfield, J., et al. (2005a). Effective literacy teaching practices in the early years of schooling. *A Special Edition of the Australian Journal of Language and Literacy*, 28(3), 175-249.
- Louden, W., Rohl, M., Barratt-Pugh, C., Brown, C., Cairney, T., Elderfield, J., et al. (2005b). In teachers' hands: Effective literacy teaching practices in the early years of schooling. Mount Lawley, WA: Edith Cowan University.
- Luke, A. (1993). The social construction of literacy in the primary school. In L. Unsworth (Ed.), *Literacy learning and teaching: Language as social practice in the primary school* (pp. 1-92). South Melbourne: Macmillan Education Australia Pty Ltd.
- Luke, A., Baty, A., & Stephens, C. (1989). 'Natural conditions for language learning: A critique'. *English in Australia*(89).
- Luke, A., & Freebody, P. (1999). A map of possible practices: Further notes on the four resources model. *Practically Primary*, 4(2), 5-11.
- Luke, A., & Luke, C. (2001). Adolescence lost/ childhood regained: On early intervention and the emergence of the techno-subject. *Journal of Early Childhood Literacy*, 1(1), 91-120.
- Luke, C. (1999). What next? Toddler netizens, playstation thum, techno-literacies. *Contemporary Issues in Early Childhood*, 1(1).

- Luke, C. (2000). Cyber-schooling and technological change. In B. Cope & M. Kalantzis (Eds.), *Multiliteracies: Literacy learning and the design of social futures* (pp. 69-91). South Yarra: Macmillan Publishers.
- Lysaker, J. T., Wheat, J., & Benson, E. (2010). Children's spontaneous play in writer's workshop. *Journal of Early Childhood Literacy*, 10(2).
- Mallette, M. H., & Duke, N. K. (2011). Introduction. In N. K. Duke (Ed.), *Literacy research methodologies*. (pp. 1-3). New York, NY: Guilford Press.
- Marsh, J. (2003). Early childhood literacy and popular culture. In N. Hall, J. Larson & J. Marsh (Eds.), *Handbook of early childhood literacy*. London, UK.: Sage Publications.
- Marsh, J. (2005). Cultural Icons: Popular culture, media and new technologies in early childhood. *Every Child*, 11(4), 14-15.
- Marsh, J. (2006). Emergent media literacy: Digital animation in early childhood. *Language and Education*, 20(6), 493-506.
- Marsh, J. (2007). Icurricula, ipedagogies and outmoded ideologies: Literacy teaching and learning in the digital era. Paper presented to the Future Directions in Literacy: International Conversations Conference, Sydney, 9-12 July.
- Marsh, J. (2008). Media literacy in the early years. In J. Marsh & E. Hallet (Eds.), *Desirable literacies: Approaches to language and literacy in the early years* (pp. 205-222). London: Sage.
- Marsh, J., Brooks, G., Hughes, J., Ritchie, L., Roberts, S., & Wright, K. (2005). Digital beginnings: *Young children's use of popular culture, media and new technologies*. Sheffield, UK: University of Sheffield.
- Martello, J. (2007). Many roads through many modes: Becoming literate in childhood. In L. Makin, C. Jones Diaz & C. McLachlan (Eds.), *Literacies in childhood: Changing views, changing practice* (2nd ed., pp. 89-103). Merrickville, N.S.W.: Elsevier.
- McLean, K. (2007). Literacy meets technology in the primary school: Symbiosis of literacy and technology. Paper presented to the Future Directions in Literacy Conference: International Conversations, Sydney, 9-12 July.
- McLean, K. (2009). Technology as a doorway to literacy in the early years of education: access, equity and quality in literacy education. Paper presented at the *National Conference for Teachers of English and Literacy*. Retrieved May 23, 2010 from ALEA website: <http://www.englishliteracyconference.com.au/files/documents/hobart/conferencePapers/refereed/MacleanKaren.pdf>
- McNamara, S., Jones, M., & McLean, K. (2007). *Stories in ICT professional development*. Report to Department of Science Education and Training, Canberra, Australia.
- Meadows, M., & Murphy, F. (2004). Using technology in early childhood environments to strengthen cultural connections. *Information Technology in Childhood Education Annual*, 1, 39-47.
- Merchant, G. (2006). A sign of the times: Looking critically at popular digital writing. In J. Marsh & E. Millard (Eds.), *Popular literacies, childhood and schooling* (pp. 93-108). Oxen: Routledge.
- Merchant, G. (2008). Digital writing in the early years. In J. Coiro, M. Knobel, C. Lankshear & D. J. Leu (Eds.), *Handbook of research on new literacies* (pp. 751-774). New York: Routledge & Taylor Francis Group.

- Mertens, D., M. (2005). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (2nd ed.). Thousand Oaks, Calif.: Sage Publications.
- Montero, M. K., & Washington, R. D. (2011). *Narrative approaches: Exploring the phenomenon and/or method*. In N. K. Duke (Ed.), *Literacy Research Methodologies*. (pp. 331-352). New York, NY: Guilford Press.
- Morrow, L., Barnhart, S., & Rooyakkers, D. (2002). Integrating technology with the teaching of an early literacy course. *The Reading Teacher*, 56(3), 218-230.
- Nakata, M. (2000). History, cultural diversity and English language teaching. In B. Cope & M. Kalantzis (Eds.), *Multiliteracies: Literacy learning and the design of social futures* (pp. 105-120). South Yarra: Macmillan Publishers Australia.
- Nixon, H. (2001). ICT, literacy and disadvantage. In C. Durrant & C. Beavis (Eds.), *P(ict)ures of English: Teachers, learners and technology* (pp. 191-209). Kent Town, SA: Wakefield Press.
- O'Rourke, M., & Harrison, C. (2004). The introduction of new technologies: new possibilities for early childhood pedagogy. *Australian Journal of Early Childhood*, 29(2), 11(18).
- Papert, S. (1993). *The children's machine: Rethinking school in the age of the computer*. New York: Basic Books.
- Parliament of Victoria Education and Training Committee. (2009). *Final Report: Inquiry into effective strategies for teacher professional learning*. Melbourne, VIC: Parliament of Victoria.
- Pegg, J., Reading, C., & Williams, M. (2007). *Partnerships in ICT learning study: Full report*. Retrieved September 6, 2009 from DEEWR website:
http://www.deewr.gov.au/schooling/DigitalEducationRevolution/Documents/pictl_full_report_1.pdf.
- Piaget, J. (1965). *Judgement and reasoning in the child*. London, GBR: Routledge & Kegan Paul.
- Plowman, L., Stephen, C., & McPake, J. (2008). Supporting young children's learning with technology at home in in preschool. *Research Papers in Education*, 25(1), 93-113.
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1-15.
- Prensky, M. (2006). *"Don't bother me mum - I'm learning!"*. St Paul, MN: Paragon House.
- Reinking, D., Labbo, L. D., & McKenna, M. (2004). Navigating the changing landscape of literacy: current theory and research in computer-based reading and writing. In J. Flood (Ed.), *Handbook of research on teaching literacy through the communicative and visual arts* (pp. 77-90). Mahweh, New Jersey: Lawrence Erlbaum Associates.
- Richards, L., & Morse, J. (2007). *User's guide to qualitative methods* (2nd ed.). Thousand Oaks: Sage Publications.
- Riessman, C. K. (2008). *Narrative methods for the human sciences*. Thousand Oaks, CA.: Sage Publications.
- Robson, C. (2002). *Real world research* (2nd ed.). Massachusetts: Blackwell Publishers.

- Sefton-Green, J. (2001). The 'end of school' or just 'out of school'? ICT, the home and digital cultures. In C. Durrant & C. Beavis (Eds.), *P(ict)ures of English: Teachers, learners and technology* (pp. 162-174). Kent Town: Wakefield Press.
- Siraj-Blatchford, I. (2009). Conceptualising progression in the pedagogy of play and sustained shared thinking in early childhood education: A Vygotskian perspective. *Educational and Child Psychology*, 26 (2) pp.77-89
- Siraj-Blatchford, J., & Whitebread, D. (2003). *Supporting information and communications technology in the early years*. Berkshire, UK: Open University Press.
- Smagorinsky, P. (1995). The social construction of data: Methodological problems of investigating learning in the zone of proximal development. *Review of Educational Research*, 65(3), 191-212.
- Snyder, I. (1996). Integrating computers into the literacy curriculum: More difficult than we think. *Australian Journal of Language and Literacy*, 19(4), 330-344.
- Snyder, I. (2001). The new communication order. In C. Durrant & C. Beavis (Eds.), *P(ict)ures of English: Teachers, learners and technology* (pp. 111-124). Kent Town: Wakefield Press.
- Snyder, I. (2002a). Communication, imagination, critique- literacy education for the electronic age. In I. Snyder (Ed.), *Silicon literacies: Communication, innovation and education in the electronic age* (pp. 173-183). London: Routledge.
- Snyder, I. (2008). *The literacy wars: Why teaching children to read and write is a battleground in Australia*. Crows Nest, NSW: Allen & Unwin.
- Snyder, I. (Ed.). (2002b). *Silicon literacies: Communication, innovation and education in the electronic age*. London: Routledge.
- Stake, R. (2000). Case studies. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed.). Thousand Oaks: Sage Publications Inc.
- Street, B. (1984). *Literacy in theory and practice*. Cambridge: Cambridge University Press.
- The New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66(1), 60-92.
- The New London Group. (2000). A pedagogy of multiliteracies. In B. Cope & M. Kalantzis (Eds.), *Multiliteracies: Literacy learning and the design of social futures* (pp. 9-37). South Yarra: Macmillan Publishers Australia.
- Turbill, J. (2001). A researcher goes to school: The integration of technology into early literacy curriculum. *Journal of Early Childhood Literacy*, 1(3).
- Turbill, J. (2003). Exploring the potential of the digital language experience approach in Australian classrooms. *Reading online*, 6(7). Retrieved September 12, 2009 from <http://www.readingonline.org>
- Turbill, J., & Murray, J. (2006). Early literacy and new technologies in Australian schools: Policy, research and practice. In M. C. McKenna, L. D. Labbo, R. D. Kieffer & D. Reinking (Eds.), *International handbook of literacy and technology* (Vol. 2). Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Turner, M., & Turbill, J. (2007). Kinder kids: Learning to read in the 21st century. Paper presented to the Critical Capital: Teaching and Learning: AATE and ALEA National Conference 8-11

- July. Retrieved November 15, 2009 from AATE/ALEA website:
<http://www.englishliteracyconference.com.au/files/documents/Papers/Refereed%20Papers/Margaret%20Turner.pdf>
- Unsworth, L. (2001). *Teaching multiliteracies across the curriculum: Changing dimensions of text and image in classroom practice*. Buckingham, UK: Open University Press.
- Unsworth, L. (2002). Changing dimensions of school literacies. *Australian Journal of Language and Literacy*, 25(1), 62-77.
- VCAA. (2007). *Victorian Essential Learning Standards (VELS): Structure of the English domain*. Retrieved September 12, 2010 from Victorian Curriculum and Assessment Authority, State Government of Victoria website:
<http://vels.vcaa.vic.edu.au/english/structure.html>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA.: Harvard University Press.
- Walsh, D. J., Baker, N., Lee, T. B., Chung, Y., Chung, C., & Colleagues. (2007). Using digital video in field based research with children. In J. A. Hatch (Ed.), *Early childhood qualitative research* (pp. 43-62) New York, N.Y.: Routledge Taylor and Francis Group.
- Walsh, M. (2006a). Literacy and learning with multimodal texts: Classroom glimpses. *Synergy*, 4(1), 43-49.
- Walsh, M. (2006b). The 'textual shift': Examining the reading process with print, visual and multimodal texts. *Australian Journal of Language and Literacy*, 29(1), 24-36.
- Walsh, M. (2010). Multimodal literacy: What does it mean for classroom practice? *Australian Journal of Language and Literacy*, 33(3), 211-229.
- Walsh, M. (2011). *Multimodal literacy: Researching classroom practice*. Newtown, NSW: Primary English Teaching Association (e:lit).
- Walshe, R. D. (1981a). *Every child can write*. Rozelle: Primary English Teaching Association.
- Walshe, R. D. (Ed.). (1981b). *Donald Graves in Australia: "children want to write..."* Rozelle, NSW: Primary English Teaching Association.
- Whitebread, D., Coltman, P., Jameson, H., & Lander, R. (2009). Play, cognition and self-regulation: What exactly are children learning when they learn through play. *Educational and Child Psychology*, 26 (2) pp.40-52.
- Whitebread, D. & Jameson, H. (2005). Play, storytelling and creative writing. In J.R. Moyles (Ed.), *Excellence of play* (2nd ed., pp. 59-71). Berkshire, GBR: McGraw-Hill Education.
- Wing Jan, L. (2009). *Write ways: Modelling writing forms*. South Melbourne, Victoria: Oxford University Press.
- Wohlend, K. E. (2009). Early adopters: Playing new literacies and pretending new technologies in print-centric classrooms. *Journal of Early Childhood Literacy*, 9(2), 117-140
- Wood, E. (2010). Reconceptualising the play-pedagogy relationship. In L. Brooker & S. Edwards (Eds.), *Engaging play* (pp. 11-24). Maidenhead: McGraw-Hill.

- Wood, D, Bruner, J & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17, 89-100.
- Yallop, C., Bernard, J.R.L., Blair, D., Butler, S., Delbridge, A., Peters, P., & Witton, N. (2005). *Macquarie Dictionary* (4th ed.). Macquarie University, NSW: The Macquarie Library Pty Ltd.
- Yin, R. K. (1989). *Case study research* (Vol. 5). Newbury Park, Calif.: Sage Publications.
- Zammit, K., & Downes, T. (2002). New learning environments and the multiliterate individual: A framework for educators. *Australian Journal of Language and Literacy*, 25(2), 24-36.
- Zevenbergen, R. (2007). Digital natives come to preschool: implications for early childhood practice. *Contemporary Issues in Early Childhood*, 8(1), 19-29.
- Zevenbergen, R., & Lerman, S. (2006). Using ICTs to support numeracy learning across diverse settings. Paper presented to the MERGA Conference. Retrieved April 14, 2010 from MERGA website: <http://www.merga.net.au/node/55?query=zevenbergen>
- Zevenbergen, R., & Logan, H. (2008). Computer use by preschool children: Rethinking practice as digital natives come to preschool. *Australian Journal of Early Childhood*, 33(1), 37-44.

Appendix 1: Initial Interview Questions

Initial Interview Questions

Questions for Initial Interviews	
Teaching experience and background	• Could you tell me about your teaching experience and areas of teaching interest? • What key areas of professional learning have you been involved in? • What do you feel most passionate about in your teaching?
Teaching philosophy	• How do you feel children best learn? • How does this translate in your classroom?
Literacy teaching and learning	• Think about successful literacy teaching and learning experiences in your classroom. Can you describe these experiences? • Can you identify any underlying reasons for the success? • Think about some less successful literacy teaching and learning experiences in your classroom. Can you describe these experiences? • Can you identify any underlying reasons for the lack of success?
Literacy beliefs and understandings	• Can you describe your understanding of what it means to be 'literate'? • Can you identify any of your key beliefs about literacy that underpin your literacy teaching? • When you reflect on your current class what are your key goals for their literacy learning? Why? Do these goals change from year to year? Why/why not?
Technology	• How do you teach literacy in your classroom? Why? • How would you describe technology? What does the word technology encompass?
Technology competence	• How would you describe your competence with technology? • What do you feel are your strengths in technology? • What do you feel are your weaknesses in technology? • Are there any areas of professional learning you would like to pursue in this area? Why?
Technology teaching and learning	• How would you describe your use of technology in the classroom? Why? • Can you describe any successful teaching and learning moments incorporating technology in the classroom? • What do you think were the underlying reasons for the success? • Can you describe any unsuccessful teaching and learning moments incorporating technology in the classroom? • What do you think were the underlying reasons for the lack of success?
Technology beliefs and understandings	• How important to you is technology in the classroom? Why? • How do you believe technology should be used in the classroom? Why?
Literacy and technology beliefs and understandings	• When you consider technology in the literacy session how do you visualise this? • Is it important? Why/why not?
Conclusion	• Is there anything else that I should know or that you would like to add?

Appendix 2: Ethics

Information Letters

Consent Forms

Letter to Principal

Information Letters for Informed Consent for Photographs

Forms for Informed Consent for Photographs

INFORMATION LETTER TO PARTICIPANTS

Project Title: Technology as a doorway to literacy in the early years of education.

Name of Supervisor: Associate Professor Sue McNamara

Name of Student Researcher: Karen McLean

Program in which enrolled: Doctor of Philosophy

Dear Parent/Guardian,

You are invited to provide informed consent for your son/daughter to participate in a research study. As a staff member of Australian Catholic University (ACU, Ballarat) and a doctoral student of Associate Professor Sue McNamara, Head of School of Education, Victoria, Australian Catholic University, I am exploring the relationship between literacy and technology in the early years of education. The study suggests that there exists a relationship between literacy and technology that may be beneficial to student learning. The study focuses on teacher and student beliefs and understandings of literacy and technology. Kindergarten teachers participating in this study will plan, implement and reflect on new ways of teaching, learning, thinking and accessing information using technology. Data collection methods will include teacher interviews, teacher journal, researcher journal, work samples and video data. Data collection will occur across terms three and four of 2008.

In my role as researcher I will support teacher participants to implement new ways of teaching, learning, thinking and accessing information using technology in the classroom. Data collected from kindergarten teacher participants will be in the form of interview data and reflective journals. In addition to this, video data will be used to determine the ways in which children engage with technology in the literacy session and the kinds of learning that occurs.

All children involved in this research project must have informed consent from parent or guardian.

Data collected from this project will be used to determine how teacher beliefs and understandings about literacy and technology influence the way in which technology is used in the classroom, and how child beliefs and understandings about literacy and technology influence learning. In addition, classroom video data will be used to determine how children in the early years of education use technology, how teacher control over technology can influence learning opportunities and the potential for improved literacy learning through technology.

Teacher and student participation in this study are voluntary. Confidentiality and security practices outlined above serve to protect participants from any remote possibility of coercion to participate. Participants can withdraw their participation at any time and will be given access to counselling services if required.

All participants in this research study will be assured confidentiality. Data gathered; interview data, classroom video data, interview transcripts, reflective journals, student work samples and researcher journal will be kept in the strictest confidence and participants will not be named personally in any documentation that may be created or used at a later date. Arrangements will be made to protect confidentiality of data and no one will have access to data other than the research investigators. However, please note that confidentiality of

Appendix 2: Ethics-Information Letters

information provided is subject to legal limitations (e.g., subpoena, freedom of information claim, or mandatory reporting).

Any question regarding the project titled “*Technology as a doorway to literacy in the early years of education*” can be directed to the researcher:

Karen McLean of the Trescowthick School of Education
Australian Catholic University, Aquinas Campus, Ballarat
(03) 5336 5420

Feedback on the results of this research project will be provided to participants at the conclusion of the study and a copy of reports will be available upon request.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University.

Should you (i.e the participant) have any concerns about the conduct of this research project, please contact the Chair, Human Research Ethics Committee.

VIC:Chair, HREC
C/o Research Services
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3158
Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome.

If you agree to your child participating in this project, you should sign both copies of the Consent Form, retain one copy for your records and return the other copy to the Student Researcher. You can withdraw your consent or participation without giving a reason or suffering any penalty.

Associate Professor Sue McNamara
Principal Investigator

Karen McLean
Student Researcher

INFORMATION LETTER TO PARTICIPANTS

Project Title: Technology as a doorway to literacy in the early years of education.

Name of Supervisor: Associate Professor Sue McNamara

Name of Student Researcher: Karen McLean

Program in which enrolled: Doctor of Philosophy

Dear Parent/Guardian,

You are invited to provide informed consent for your son/daughter to participate in a research study. As a staff member of Australian Catholic University (ACU, Ballarat) and a doctoral student of Associate Professor Sue McNamara, Head of School of Education, Victoria, Australian Catholic University, I am exploring the relationship between literacy and technology in the early years of education. The study suggests that there exists a relationship between literacy and technology that may be beneficial to student learning. The study focuses on teacher and student beliefs and understandings of literacy and technology. Teachers participating in this study will plan, implement and reflect on new ways of teaching, learning, thinking and accessing information using technology. Data collection methods will include teacher interviews, teacher journal, researcher journal, work samples and video data. Data collection will occur across terms two, three and four of 2008.

In my role as researcher I will support teacher participants to implement new ways of teaching, learning, thinking and accessing information using technology in the classroom. Data collected from teacher participants will be in the form of interview data and reflective journals. In addition to this, video data will be used to determine the ways in which children engage with technology in the literacy session and the kinds of learning that occurs.

All children involved in this research project must have informed consent from parent or guardian.

Data collected from this project will be used to determine how teacher beliefs and understandings about literacy and technology influence the way in which technology is used in the classroom, and how child beliefs and understandings about literacy and technology influence learning. In addition, classroom video data will be used to determine how children in the early years of schooling use technology, how teacher control over technology can influence learning opportunities and the potential for improved literacy learning through technology.

Teacher and student participation in this study are voluntary. Confidentiality and security practices outlined above serve to protect participants from any remote possibility of coercion to participate. Participants can withdraw their participation at any time and will be given access to counselling services if required.

All participants in this research study will be assured confidentiality. Data gathered; interview data, classroom video data, interview transcripts, reflective journals, student work samples and researcher journal will be kept in the strictest confidence and participants will not be named personally in any documentation that may be created or used at a later date. Arrangements will be made to protect confidentiality of data and no one will have access to data other than the research investigators. However, please note that confidentiality of

Appendix 2: Ethics-Information Letters

information provided is subject to legal limitations (e.g., subpoena, freedom of information claim, or mandatory reporting).

Any question regarding the project titled “*Technology as a doorway to literacy in the early years of education*” can be directed to the researcher:

Karen McLean of the Trescowthick School of Education
Australian Catholic University, Aquinas Campus, Ballarat
(03) 5336 5420

Feedback on the results of this research project will be provided to participants at the conclusion of the study and a copy of reports will be available upon request.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University.

Should you (i.e the participant) have any concerns about the conduct of this research project, please contact the Chair, Human Research Ethics Committee.

VIC:Chair, HREC
C/o Research Services
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3158
Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome.

If you agree to your child participating in this project, you should sign both copies of the Consent Form, retain one copy for your records and return the other copy to the Student Researcher. You can withdraw your consent or participation without giving a reason or suffering any penalty.

.....
Principal Investigator

.....
Student Researcher

INFORMATION LETTER TO PARTICIPANTS

Project Title: Technology as a doorway to literacy in the early years of education.

Name of Supervisor: Associate Professor Sue McNamara

Name of Student Researcher: Karen McLean

Program in which enrolled: Doctor of Philosophy

Dear Staff,

You are invited to participate in a research study. As a staff member of Australian Catholic University (ACU, Ballarat) and a doctoral student of Associate Professor Sue McNamara, Head of School of Education, Victoria, Australian Catholic University, I am exploring the relationship between literacy and technology in the early years of education. The study suggests that there exists a relationship between literacy and technology. Using case study methodology the research proposes to focus on two Victorian early years of schooling classrooms, exploring teacher and student ideologies, values and understandings of literacy and language practices and the way in which these are embedded in classroom practice. Participating teachers will engage in an action-reflection model of professional learning to plan, implement and reflect on new ways of teaching, learning, thinking and accessing information through the symbiosis of literacy and technology. Data collection methods will include semi-structured interviews, mediated interviews, teacher reflective journal, researcher journal, work samples and video data. Teachers in the Ballarat area will be offered the opportunity to participate in the research project throughout 2008 with data collection occurring in terms two, three and four of 2008.

In my role as researcher I will work with teacher participants supporting teacher development and competence in technology, sharing and brainstorming of ideas for curriculum development, or through providing framework and support for planning and implementation of the literacy program. Data collected from teacher participants would include semi-structured interview data exploring values and understandings of literacy and language practices and the way in which these are embedded in classroom practice before and after the project, reflective journals describing the teacher journey and classroom video data used to examine the way in which technology is mediated in the classroom. In addition to this, video data will be used to determine the ways in which children engage with technology in the literacy session and the kinds of learning that occurs.

All children involved in this research project must have informed consent from parent or guardian. Using sampling techniques a further three to six students from each classroom will be followed more closely throughout the study. Sampling will be used to ensure that the students chosen to follow more closely will be representative of gender and the level of literacy achievement. Data collection will be in the form of mediated interviews seeking child views on literacy and technology before and after the project and the collection of student work samples and artefacts.

Data collected from this project will be used to determine how teacher beliefs and understandings about literacy and technology influence pedagogy and how student beliefs and understandings about literacy and technology influence learning. In addition, classroom video data will be used to determine how students in the early years of schooling engage with technology in the literacy session, how teachers mediate the use of technology in the classroom and the potential for improved literacy learning through technology.

Teacher and student participation in this study are voluntary. Confidentiality and security practices outlined above serve to protect participants from any remote possibility of coercion

Appendix 2: Ethics-Information Letters

to participate. Participants can withdraw their participation at any time and will be given access to counselling services if required.

All participants in this research study will be assured confidentiality. Data gathered; interview data, classroom video data, interview transcripts, reflective journals, student work samples and researcher journal will be kept in the strictest confidence and participants will not be named personally in any documentation that may be created or used at a later date. Arrangements will be made to protect confidentiality of data and no one will have access to data other than the research investigators. However, please note that confidentiality of information provided is subject to legal limitations (e.g., subpoena, freedom of information claim, or mandatory reporting).

Any question regarding the project titled “*Technology as a doorway to literacy in the early years of education*” can be directed to the researcher:

Karen McLean of the Trescowthick School of Education
Australian Catholic University, Aquinas Campus, Ballarat
(03) 5336 5420

Feedback on the results of this research project will be provided to participants at the conclusion of the study and a copy of reports will be available upon request.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University.

Should you (i.e the participant) have any concerns about the conduct of this research project, please contact the Chair, Human Research Ethics Committee.

VIC:Chair, HREC
C/o Research Services
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3158
Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome.

If you agree to participate in this project, you should sign both copies of the Consent Form, retain one copy for your records and return the other copy to the Student Researcher. You can withdraw your consent or participation without giving a reason or suffering any penalty.

.....
Principal Investigator

.....
Student Researcher

Australian Catholic University

Consent Form

Copy for Participant to Keep

Project Title: Technology as a doorway to literacy in the early years of education.

Supervisor: Associate Professor Sue McNamara

Student Researcher: Karen McLean

Consent (fill out below)

I.....parent/guardian of.....(minor's name)

of.....(address)

hereby consent to(minor's name) participation in the above research study.

The research program in which(minor's name) is being asked to participate has been fully explained to me, verbally and in writing, and any matters on which I have sought information have been answered to my satisfaction.

I understand that the classroom literacy session will be video taped and my child's work samples and artefacts may be collected as part of data collection. I understand that all information (interviews, video footage, researcher journal, reflective journal, work samples and artefacts) will be treated with the strictest confidence and data will be stored separately from any listing that includes my child's name and address.

I agree to my child's participation in this research study throughout term three and four in 2008, realising that I can withdraw my consent at any time without comment or penalty. I agree that research data for the study may be published or may be provided to other researchers in a form that does not identify my child in any way.

NAME OF PARTICIPANT:.....

SIGNATURE.....

DATE.....

SIGNATURE OF SUPERVISOR. Associate Professor Sue McNamara **DATE:** 09/07/2008

SIGNATURE OF STUDENT RESEARCHER. Karen McLean **DATE:** 09/07/2008

Australian Catholic University

Consent Form

Copy for Participant to Keep

Project Title: Technology as a doorway to literacy in the early years of education.

Supervisor: Associate Professor Sue McNamara

Student Researcher: Karen McLean

Consent (fill out below)

I.....parent/guardian of.....(minor's name)

of.....(address)

hereby consent to(minor's name) participation in the above research study.

The research program in which(minor's name) is being asked to participate has been fully explained to me, verbally and in writing, and any matters on which I have sought information have been answered to my satisfaction.

I understand that the classroom literacy session will be video taped and my child's work samples and artefacts may be collected as part of data collection. I understand that all information (interviews, video footage, researcher journal, reflective journal, work samples and artefacts) will be treated with the strictest confidence and data will be stored separately from any listing that includes my child's name and address.

I agree to my child's participation in this research study throughout term three and four in 2008, realising that I can withdraw my consent at any time without comment or penalty. I agree that research data for the study may be published or may be provided to other researchers in a form that does not identify my child in any way.

NAME OF PARTICIPANT:.....

SIGNATURE.....

DATE.....

SIGNATURE OF SUPERVISOR..... **DATE:**

SIGNATURE OF STUDENT RESEARCHER..... **DATE:**

Australian Catholic University

Consent Form

Copy for Participant to Keep

Project Title: Technology as a doorway to literacy in the early years of education.

Supervisor: Associate Professor Sue McNamara

Student Researcher: Karen McLean

Consent (fill out below)

I,.....of.....

.....

have read and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this research study throughout terms two, three and four in 2008. I agree to be interviewed by the researcher and video /audio taped, realising that I can withdraw my consent at any time without comment or penalty. I agree that research data for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

I understand that all information I provide (interviews, reflective journal, video footage, researcher journal) will be treated with the strictest confidence and data will be stored separately from any listing that includes my name and address.

NAME OF PARTICIPANT:.....

SIGNATURE.....

DATE.....

SIGNATURE OF SUPERVISOR.....

DATE:

SIGNATURE OF STUDENT

RESEARCHER..... **DATE:**

Dear Principal,

I am writing to seek your permission to endorse staff and student involvement in a research project that I am undertaking as part of my doctoral studies at Australian Catholic University. The study suggests that there exists a symbiotic relationship between literacy and technology. By symbiotic we mean a mutually beneficial relationship. The study is set against the backdrop of the implementation of curriculum strategies in the form of Victorian Essential Learning Standards (VELS) in Victorian schools. The overarching question, **“How can technologies be a doorway to literacy in the early years of schooling?”** is informed through literature providing historical, current and emerging perspectives on literacy and technology in the early years of schooling. Using case study methodology the research proposes to focus on two Victorian early years of schooling classrooms, exploring teacher and student ideologies, values and understandings of literacy and language practices and the way in which these are embedded in classroom practice. Teachers will engage in an action-reflection model of professional learning to plan, implement and reflect on new ways of teaching, learning, thinking and accessing information through the symbiosis of literacy and technology. Data collection methods will include semi-structured interviews, mediated interviews, teacher reflective journal, researcher journal, work samples and video data.

The research addresses concerns regarding the uptake of technology by classroom teachers in the early years of schooling and the infusion of technology across the curriculum. Using an action-reflection model of professional learning teachers will be supported to develop technology skills, knowledge and understanding appropriate to their needs, and pedagogical understanding needed to interweave technology and literacy seamlessly in the early years.

Teacher and student participants would be involved in the project throughout terms two, three and four of 2008. In my role as researcher I will work with teacher participants supporting teacher development and competence in technology, sharing and brainstorming of ideas for curriculum development, or through providing framework and support for planning and implementation of the literacy program. Data collected from teacher participants would include semi-structured interview data exploring values and understandings of literacy and language practices and the way in which these are embedded in classroom practice before and after the project, reflective journals describing the teacher journey and classroom video data used to examine the way in which technology is mediated in the classroom. In addition to this, video data will be used to determine the ways in which children engage with technology in the literacy session and the kinds of learning that occurs.

All student participants involved in this research project must have informed consent from parent or guardian. Using stratified sampling techniques a further three to six students from each classroom will be followed more closely throughout the study. Stratified sampling will be used to ensure that the students chosen to follow more closely will be representative of gender and the level of literacy achievement. Data collection will be in the form of mediated interviews seeking child views on literacy and technology before and after the project and the collection of student work samples and artefacts.

Additional data collection will be in the form of a researcher journal that I will keep throughout the data collection period of terms 2, 3 and 4, 2008. All data collected will be confidential and kept anonymous in reports. All responses will be kept in the strictest confidence and participants will not be named personally in any documentation that may be created or used at a later date.

Appendix 2: Ethics-Letter to Principal

This study aims to provide insights into the symbiotic relationship between literacy and technology in the early years of schooling, with particular relevance to the current educational climate in regional Victoria that challenges educators to put emerging theoretical perspectives of literacy and technology into practice using existing resources and frameworks. With a strong focus on pedagogy it is anticipated that this study will shed light on new ways of teaching, learning and accessing information drawing on the existing relationship between literacy and technology.

As I indicated at the beginning of this letter I am seeking your permission to endorse the involvement of staff and students at this school in the study. I would like to contact staff regarding involvement in this research through introductory letter and personal visitation to outline the research study and answer questions. I would like to address parents of students in classrooms of teacher participants at a parent meeting, to outline the research study and answer parent questions. I will organise the distribution of an information letter to be sent home to parents of students in classrooms of participant teachers. Please contact me by phone on (03) 5336 5420 or by mail if you require further information or if you would like to discuss any aspects of the project.

I look forward to hearing from you.

Yours sincerely,

Karen McLean

Lecturer, English and Technology Education
Trescowthick School of Education
Australian Catholic University
Aquinas Campus
PO BOX 650
Ballarat 3353

INFORMATION LETTER

Project Title: Technology as a doorway to literacy in the early years of education.

Name of Supervisor: Associate Professor Sue McNamara

Name of Student Researcher: Karen McLean

Program in which enrolled: Doctor of Philosophy

Dear Parent/Guardian,

In 2008 you were invited to provide informed consent for your son/daughter to participate in a research study. As a staff member of Australian Catholic University (ACU, Ballarat) and a doctoral student of Associate Professor Sue McNamara, Head of School of Education, Victoria, Australian Catholic University, I was exploring the relationship between literacy and technology in the early years of education. Data collection methods included a teacher journal, researcher journal and work samples. As part of the data collection a series of photographs were collected. The thesis is now ready for submission and I would like to use some of these photographs in the final thesis.

I am writing to seek your informed consent to use these photographs in the thesis. These photographs may also be used for teacher professional learning, conference presentations, and in journal or book publications related to this research. I have included a copy of the photographs that I am seeking informed consent to use in the thesis and in any related publications or presentations. **These photographs will be treated with the strictest confidence and children's names or addresses will not be identified in any use of the photographs.**

If you agree to providing informed consent for the use of the photographs of your child could you please sign the Informed Consent Form and return the school by **Thursday 17th November, 2011.**

Kind regards,

Principal Investigator

Student Researcher

INFORMATION LETTER

Project Title: Technology as a doorway to literacy in the early years of education.

Name of Supervisor: Associate Professor Sue McNamara

Name of Student Researcher: Karen McLean

Program in which enrolled: Doctor of Philosophy

Dear Staff,

In 2008 you were invited to provide informed consent to participate in a research study. As a staff member of Australian Catholic University (ACU, Ballarat) and a doctoral student of Associate Professor Sue McNamara, Head of School of Education, Victoria, Australian Catholic University, I was exploring the relationship between literacy and technology in the early years of education. Data collection methods included a teacher journal, researcher journal and work samples. As part of the data collection a series of photographs were collected. The thesis is now ready for submission and I would like to use some of these photographs in the final thesis.

I am writing to seek your informed consent to use these photographs in the thesis. These photographs may also be used for teacher professional learning, conference presentations, and in journal or book publications related to this research. I have included a copy of the photographs that I am seeking informed consent to use in the thesis and in any related publications or presentations. These photographs will be treated with the strictest confidence and no names or addresses will be identified in any use of the photographs.

If you agree to providing informed consent for the use of the photographs could you please sign the Informed Consent Form and return the school by Friday 18th November, 2011.

Kind regards,

Principal Investigator

Student Researcher

INFORMED CONSENT FORM

Project Title: Technology as a doorway to literacy in the early years of education

Supervisor: Associate Professor Sue McNamara

Student Researcher: Karen McLean

Informed Consent (fill out below)

I,.....parent/guardian

of.....(minor's name)

of.....(address)

hereby consent to the photographs of(minor's name) that I have viewed to be used in the project.

I understand that these photographs will be used in the thesis and may be used for teacher professional learning, conference presentations, and in journal or book publications related to this research. I understand that these photographs will be treated with the strictest confidence and my child's name or address will not be identified in any use of the photographs.

NAME OF PARENT/GUARDIAN:.....

SIGNATURE..... **DATE**.....

SIGNATURE OF SUPERVISOR

DATE: 9/11/2011

SIGNATURE OF STUDENT RESEARCHER.

DATE: 9/11/2011

INFORMED CONSENT FORM

Project Title: Technology as a doorway to literacy in the early years of education

Supervisor: Associate Professor Sue McNamara

Student Researcher: Karen McLean

Informed Consent (fill out below)

I,.....of.....

.....
hereby consent to the photographs that I have viewed to be used in the project.

I understand that these photographs will be used in the thesis and may be used for teacher professional learning, conference presentations, and in journal or book publications related to this research. I understand that these photographs will be treated with the strictest confidence and my name or address will not be identified in any use of the photographs.

NAME OF PARTICIPANT:.....

SIGNATURE..... **DATE**.....

SIGNATURE OF SUPERVISOR

DATE: 9/11/2011

SIGNATURE OF STUDENT RESEARCHER.

DATE: 9/11/2011

Appendix 3: Teacher Learning Story Journal Template

Learning Story Journal			
Data Collection July - December			

Appendix 3: Teacher Learning Story Journal Template

Title:		
<u>Domain</u>	<u>Dated Commentary of critical incidents</u>	<u>Artefact</u>
Taking an interest <i>(Initial discussions and planning)</i>	• Recognition of interest in the focus • Making connections between artefacts, activities, social identities, places • Recognising resources and abilities to support the interest	Examples for all domains: Photographs Digital video recordings Interview-podcast or recordings Work sample- photographed or digital version embedded
Being Involved <i>(Implementation)</i>	• Readiness to be involved, attention • Making informed judgements • Employ strategies to be involved	Work selected by adults and children, annotated with key aims highlighted transcripts of collaborative exchanges between the children
Persisting with difficulty <i>(Challenges)</i>	• Enthusiasm for persisting with difficulty • Making a mistake • Tackling difficulty • Problem solving	Dictated comments by children Photocopies or photos of children's work
Expressing an idea or a feeling <i>(Communication)</i>	• Communicate with others • Communicate ideas and feelings • Listening and responding • Reflecting	
Taking responsibility <i>(Adapting, modifying, building upon, scaffolding)</i>	• Taking responsibility • Recognise a different point of view • A view of self and others • Strategies for responsibility	

Appendix 3: Teacher Learning Story Journal Template

Learning Story No. 1.		
Title:		
<u>Domain</u>	<u>Dated Commentary of critical incidents</u>	<u>Artefact</u>
Taking an Interest		

Appendix 3: Teacher Learning Story Journal Template

Learning Story No. 1.		
Title:		
<u>Domain</u>	<u>Dated Commentary of critical incidents</u>	<u>Artefact</u>
Being Involved		

Appendix 3: Teacher Learning Story Journal Template

Learning Story No. 1.		
Title:		
<u>Domain</u>	<u>Dated Commentary of critical incidents</u>	<u>Artefact</u>
Persisting with difficulty		

Appendix 3: Teacher Learning Story Journal Template

Learning Story No. 1.		
Title:		
<u>Domain</u>	<u>Dated Commentary of critical incidents</u>	<u>Artefact</u>
Expressing an idea or a feeling		

Appendix 3: Teacher Learning Story Journal Template

Learning Story No. 1.		
Title:		
<u>Domain</u>	<u>Dated Commentary of critical incidents</u>	<u>Artefact</u>
Taking responsibility		

Appendix 3: Teacher Learning Story Journal Template

Learning Story No. Short Term Review	What Next?
What learning has occurred (main points)?	How might we encourage this interest, ability, strategy, disposition to • Be more complex. • Appear in different areas or activities? How might we encourage the next step in the learning story?

