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***FUNDS OF KNOWLEDGE
IN EARLY CHILDHOOD
COMMUNITIES OF INQUIRY***

A thesis presented
in partial fulfilment of the requirements
for the degree of
Doctor of Philosophy in Education
at Massey University,
Palmerston North,
New Zealand.

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Abstract

Inquiry is a fundamental human undertaking. The present study investigated interests-based curriculum and pedagogy in early childhood education, through the creation of a community of inquiry between children, teachers and a researcher. In two case study settings, it explored ways teachers and children co-construct interests-based curriculum and ways teachers might strengthen coherence between research, theory, practice and professional learning to support such curriculum construction. During year-long fieldwork, the researcher drew on participant observation techniques, interviews, documentation and co-constructed inquiry discussions as sources of data. Data analysis occurred on two levels: descriptive and theoretical. Sociocultural theory provides a foundation for the approaches to learning and teaching, inquiry, the research design and lenses of interpretation.

The study uses two frameworks to explain its findings, challenging and extending current understandings of funds of knowledge and communities of inquiry. In addition, it illuminates the concept of working theories. Discussion of the notion of evidence-informed inquiry explains some types of evidence teachers bring to the complexities of curriculum decision making as their funds of knowledge and working theories, thereby arguing against narrow interpretations of evidence-based practice.

This thesis argues that interpretation of children's interests, from a sociocultural perspective, requires a more analytical understanding of children's family and community experiences and their impact on children's inquiry, and of teacher interests and responsibilities in relation to culturally-valued knowledge. Further, the thesis contends that children's and teachers' co-constructed inquiry is dependent on reciprocal and responsive pedagogical relationships that provide meaningful responses during engagement in learning-and-teaching. Links between everyday knowledge and conceptual knowledge in children's learning may be brought together. In this way, participatory learning enables children and teachers to co-create a foundation for conceptual learning. Two inquiry continua and one model are offered to incorporate the key theoretical ideas and arguments of the thesis. It is argued that the model represents components of an interests-based sociocultural curriculum and pedagogy.

A funds of knowledge approach has the potential to transform early childhood learning-and-teaching environments, and implement partnerships with families, communities (including the research community) and cultures authentically. Implications for teaching practice, teachers' professional learning, research and policy are discussed to recognise and strengthen both an inquiry focus in pedagogical relationships, and an awareness of funds of knowledge in early childhood education contexts.

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I have no special gift. I am only passionately curious.

The important thing is not to stop questioning.

- *Albert Einstein*

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Chapter one

INTRODUCTION

"[H]uman life is fascinating" (Ezzy, 2002, p. 23).

Curriculum, pedagogy and inquiry

The present study investigated interests-based curriculum and pedagogy in early childhood education through children's, teachers' and a researcher's inquiry. In early childhood settings, children's interests "find voice and place within the planned curriculum" (Broadhead, 2006, p. 192) and act as the means for children and teachers to spontaneously inquire into and explore intuitive ideas. Early childhood is a term describing not only the age of children served, but also the philosophy, pedagogy and curriculum of the sector. Early childhood curriculum and pedagogy are complex and problematic (Siraj-Blatchford, 2004; E. Wood, 2004) and there is no trouble-free distinction between these two terms (Ross, 2000). Taken together, these powerful overarching concepts determine children's learning experiences in any context. Investigating curriculum and pedagogy is essential to understanding young children's educational experiences.

Interests-based curriculum and pedagogy in early childhood is highly participative and interpretive. It involves teachers and children in ongoing co-constructed inquiry learning. Mutual engagement in interests-based curriculum and pedagogy is a common guiding principle and is the focus of the present study. Inquiry is a fundamental human undertaking. Inquiry learning for children and teachers is most effective when it engages with authentic questions and issues (Wells, 1999). By investigating inquiry in specific contexts, "we may come to see how the universal urge to understand the world with the help of others plays itself out in culturally and distinctive ways" (Lindfors, 1999, p. xii).

Focus of present inquiry into curriculum and pedagogy

The central research question guiding the study was: How might teachers, children and a researcher co-construct a community of inquiry in early childhood education? Specifically, in two case study settings in North Shore City, Aotearoa/New Zealand (NZ), it explored the ways that teachers draw on their professional knowledge to co-

construct curriculum through recognising and engaging with children's interests and inquiries, and ways teachers may be encouraged to strengthen coherence between research, theory and practice to provide a knowledge base grounded in contemporary theory to support such curriculum construction.

A coherent theoretical framework provides a set of lenses or concepts through which to interpret and analyse curriculum, pedagogy and inquiry. The present study explored the application of sociocultural theories to early childhood education, emphasising responsive pedagogical relationships foremost. In addition, it was designed to assist teachers to strengthen links between sociocultural theory, research and practice. Sociocultural theory also guided the research design and interpretive procedures utilised.

The study utilised two theoretical frameworks to explain its findings. Firstly, the thesis argues that a deeper and more analytical understanding of children's learning is necessary, from a sociocultural perspective, to interpret children's authentic interests and inquiries founded in their family and community experiences. A "funds of knowledge" (González, Moll & Amanti, 2005a) approach to recognising and extending children's interests has the potential to transform early childhood learning and teaching environments and implement partnerships with families, communities and cultures authentically. Further, a funds of knowledge approach to the types of knowledge and evidence that teachers bring to their curriculum decision-making may assist teacher inquiry and reflection and strengthen research-based discourse.

Secondly, it explored the notion of a community of inquiry (Wells, 1999, 2001a, 2001b, 2002). One metaphor of a community of inquiry, a "spiral of knowing" and the concept of children's "real questions" (Wells, 1999, p. 91), are applied in various ways to early childhood education. The concept of "working theories", developed from Claxton's (1990) notion of minitheories, is explicated to support spirals of knowing as being a useful metaphor for describing ongoing incremental learning.

The next section of this chapter provides an historical overview of early childhood education in NZ in order to situate the present study, followed by an introduction to the early childhood curriculum document, *Te Whāriki* (Ministry of Education, 1996).

Although the present study is not explicitly about *Te Whāriki*, development of curriculum and pedagogy in NZ early childhood settings inevitably focuses on this document as a guide for practice. The final section overviews the purposes and content of this thesis.

Early childhood education in Aotearoa/New Zealand

Political, social, economic, cultural and historical contexts affect the beliefs and values that societies hold about appropriate curriculum and pedagogy for young children. The value of sociocultural theory for interpreting and framing a study in early childhood education is therefore foregrounded in terms of its complexity, valuing of diversity, constant development of practices, and viewing teachers, as well as children, as learners (A. Edwards, 2000).

Early childhood education services in NZ manage supervised education and care programmes for children aged birth to five years, the common age at which children begin primary school. These services have evolved in a somewhat arbitrary and fragmented way since the late 19th-century, with an educative focus emerging in the past 40 years. The more recent history of early childhood education has been tied to the feminist movement and societal change (May, 1997, 2001, 2003). This process has been influenced by its non-compulsory nature as a sector, and varying theories, philosophies and policies. Consequently, a diverse range of services, from sessional to full-day, in a range of home-based and community settings co-exist, administered by the Ministry of Education, within a legislative framework that is particularly susceptible to political change. In the wider context of NZ education, this diversity of provision is consistent with current government policy and research initiatives (e.g., see Alton-Lee, 2003; S.-E. Farquhar, 2003). Moreover, outside the public kindergarten service, the early childhood sector has historically been an "open entry" profession, able to employ unqualified or partially qualified practitioners as part of staffing.

Te Whāriki was developed during the 1990s and owes much to the skills of its developers, Helen May and Margaret Carr, in negotiating a collaborative consultative process that brought a diverse early childhood community together to agree on the document (see Te One, 2003 for a more detailed account). At the time of embarking

on this thesis, early childhood education was in the midst of a ten-year strategic policy plan to improve participation, collaboration and quality (Ministry of Education, 2002).

Curriculum document: *Te Whāriki*

Te Whāriki is one of few documents internationally intended to cater for children aged birth to five years. It divides these years into three overlapping groups: infants (birth-18 months), toddlers (1-3 years) and young children (2½-5 years). There is international agreement that curriculum for this age group ought to focus on children's interests and needs, in particular, their dispositions for learning and social and emotional well-being (Bertram & Pascal, 2002). *Te Whāriki* has been acclaimed as a curriculum document in relation to other international curricula (e.g., see Soler & Miller, 2003). It has also had considerable influence in debates regarding early childhood curriculum construction in other countries (Bröstrom, 2003; Flear, 2003). On the international stage, *Te Whāriki* was an early curriculum document entrant, noted for its progressive and non-prescriptive bases, emphasis on learning processes and orientations rather than knowledge outcomes, and bicultural content (Soler & Miller, 2003).

Te Whāriki values children as competent learners and highlights play-based learning environments as best for children. Its principles emphasise relationships, empowerment, holistic development, and family and community. These are woven with strands (well-being, belonging, contribution, communication and exploration) to construct curriculum. In operationalising assessment related to *Te Whāriki*, M. Carr (2001a) has linked children's interests to the disposition to inquire within the strand of well-being.

Te Whāriki's definition of curriculum is "the sum total of the experiences, activities, and events, whether direct or indirect, which occur within an environment designed to foster children's learning and development" (p. 10). Such a definition identifies that every experience that children engage in is a learning opportunity, whether through deliberate planning or spontaneous happenings. This provides an overt example of what Eisner (1994) described as the intended and operationalised curriculum, highlighting that chance opportunities can create curriculum. Its pedagogy (learning

and teaching approaches) is based on the notion of reciprocal and responsive relationships, a concept explored shortly.

The document is non-prescriptive in relation to curriculum content. Rather than knowledge outcomes, its indicative learning outcomes relate to ways in which "knowledge, skills, and attitudes are closely linked. These three aspects combine together to form a child's 'working theory' and help the child develop dispositions that encourage learning" (p. 44). Dispositions and working theories are matters explored further in this thesis in conjunction with children's interests and inquiries. *Te Whāriki* suggests that curriculum should be built primarily on "children's interests, strengths, needs and behaviours" (p. 28). It affirms the bicultural nature of NZ, providing links to cultural and national identity, and is designed for each early childhood setting to weave its own curriculum, reflecting the social and cultural context in which each is embedded.

The document asserts that authentic play-based learning is situated in socially and culturally constructed settings and is mediated by reciprocal and responsive relationships with people, places and things. This mediation also describes pedagogy considered appropriate for young children, drawing on the Māori term "akō" to consider learning and teaching as both a continuum and a concept that operationalises the knowledge and strengths of the teachers and learner. "People" include peers, teachers and families and their relationships with "the learner, expectations, goals, prior knowledge and experience, and intuitions" (Cowie & M. Carr, 2004, p. 95). "Places" include the organisational, structural and physical features of the early childhood setting, home and other community and cultural settings that children participate in. "Things" refers to the resources, artefacts and cultural tools that are utilised in teaching and learning interactions.

Te Whāriki is likely best located within the process-driven, child-centred, progressive classification of curriculum types described by Ross (2000). Central identifying and unifying concepts of the process-driven curriculum type are learner autonomy, exploration, self-directed learning, teachers and learners negotiating curriculum, and a participative style of pedagogy. Assessment is formative, personal and open-ended. Furthermore, learners are usually less involved in knowledge construction and more

in orientations towards learning and the processes of how to construct and understand knowledge. These elements are apparent in the narrative style of assessment, "learning stories" (M. Carr, 2001a), that has evolved in the development of practices consistent with *Te Whāriki*.

A curriculum ought to encompass coherent relationships between theory, philosophy and practice. However, there is a potential theoretical tension evident in *Te Whāriki* (Cullen, 1996). The legacy of developmental psychology, especially the theories of Piaget and Erikson, continues with the emphasis on individual children and frequent use of the metaphor of "acquiring" knowledge in the document, alongside the ecological and sociocultural theoretical perspectives of Bronfenbrenner and Vygotsky. Such tension has been accentuated in teaching practices by lack of deep understanding of relevant theory, and these theorists' differing orientations to knowledge, by teachers and teacher educators (Cullen, 1996). One consequence is that this has perhaps unnecessarily polarised distinctions between the theories rather than asserting common ground to guide teaching (Hedges, 2000; Rogoff, 1998).

Further, theoretical discourse has evolved in the intervening years since *Te Whāriki's* introduction and it is now increasingly interpreted from a sociocultural perspective (M. Carr, 2001a, 2001b; Cullen, 2003; Flear, 2003). Cullen (2003) was recently more positive about teachers' understandings and ability to adopt more socioculturally-oriented perspectives, but maintained that it remains likely that one of the constraints in the implementation of *Te Whāriki* is the knowledge base and understandings of teachers. In keeping with many countries internationally, not all early childhood teachers in NZ currently hold a teaching qualification that represents a grounding in professional knowledge. Further, it may only be recently that teacher education (and professional development) providers in NZ have altered programmes to reflect the sociocultural discourse of *Te Whāriki* (see Kane, 2005).

Overview of thesis

The purposes of the present study were to:

- increase knowledge about and bring coherence to understanding of children's experiences and interests-based curriculum and pedagogy from a sociocultural perspective;

- extend current knowledge of early childhood curriculum and pedagogy from a sociocultural perspective;
- increase understanding about teachers' professional knowledge that supports children's authentic, meaningful learning during co-constructed inquiry; and
- explore the role of an external facilitator in research partnerships to increase coherence between research, practice and professional learning.

A qualitative, interpretivist methodology was adopted (Flick, 2006; P. Hughes, 2001; D. Walsh, Tobin & Graue, 1993) because of its potential to generate rich data and acknowledge the involvement of the researcher in the study. A case study approach (Merriam, 1998) with a focus on dialogue and inquiry during participatory learning (Park, 2001; Wells, 1999, 2001a, 2001b, 2002) was utilised, consistent with the sociocultural theoretical and methodological underpinnings of the study.

A diverse range of literature informs the present study. In chapter two play as a basis of early childhood curriculum and pedagogy is overviewed and sociocultural theory's main tenets in relation to learning and teaching are described. While few studies appear to have directly addressed children's interests per se or teacher decision-making about these, literature about children's informal learning in family and community contexts is discussed to inform the study. Key concepts of the two theoretical frameworks that underpin the study, a community of inquiry and funds of knowledge, are described. Chapter three reviews research on teachers' professional knowledge, evidence-based approaches to educational decision-making and the potential of facilitated inquiry to be an effective form of teachers' professional learning. During chapters two and three a range of limitations in current theory and research are identified that guided the research questions and design of the present study.

Chapter four features explanation and justification about the research design, methodological approaches used, ethical dimensions that permeated the study and situates the researcher as the central data generation agent. Ways in which teachers and children were positioned in the study and supported co-constructed, participative inquiry to occur are described. Considerations of validity in relation to the present

study are discussed. In chapter five, the participants in the study are introduced and the methods by which data were generated during the year of fieldwork explained. Data analysis procedures are described. The justification for using funds of knowledge as a framework for presenting the findings is discussed.

Chapter six discusses the findings in relation to children's funds of knowledge-based interests and inquiries. These are identified in a range of pedagogical relationships in their families, centres and communities, in which children's active participation and inquiry enables them to build knowledge. Chapter seven presents the findings in relation to teachers' professional knowledge and inquiries, utilising and extending the conceptual framework of funds of knowledge. This analysis reveals the range of evidence types that informed teacher knowledge and practice. The ways that teacher knowledge was enriched by engagement with professional learning derived from the study's data is also described.

In chapter eight, light is shed on the nature of children's fundamental interests and inquiries and key theoretical ideas of the thesis are brought together. The thesis argues that a funds of knowledge approach to identifying children's interests and inquiries recognises these in a deeper and more analytical way than current approaches. Funds of knowledge and a community of inquiry as frameworks for recognising and responding to children's and teachers' interests and inquiries provide a foundation for a sociocultural curriculum and pedagogy. Two continua and a model are provided to incorporate key theoretical ideas and arguments.

Finally, in chapter nine, the conclusions of the study are drawn. These have wide-ranging implications for teaching practice, teacher education and professional learning, and for policy. In addition, the contributions and limitations of the study are identified and future research directions suggested.

Chapter two

PERSPECTIVES ON CHILDREN'S LEARNING

We do not encounter the world as it exists in any neutral or objective sense outside the realm of human experience. ... [T]he world is pre-interpreted for us by previous generations and we draw on the experiences that others have had before us (Säljö, 1998, p. 55).

Introduction

Early childhood education, including its research base, is multidisciplinary, drawing on fields such as psychology, sociology, education, history, anthropology and neurophysiology. Knowledge and insight from diverse fields can be woven together usefully to inform research and practice. In order to investigate interests-based curriculum and pedagogy, various bodies of literature needed to be considered. This chapter reviews literature related to children's learning, along with the theoretical underpinnings of the present study. In the first section of the chapter, the primacy of play as a theoretical and philosophical basis for early childhood education is briefly overviewed.

Currently, researchers, teachers and indeed children, can draw on a range of understandings to develop their theoretical perspectives. Consistent with current interpretations of *Te Whāriki* (Ministry of Education, 1996), the present study draws on sociocultural theory as its foundation. Sociocultural theory is an emerging field, representing various viewpoints, and inspires researchers to extend their methodologies and interpretations (Rogoff, 1998). In the second section of this chapter, key concepts of sociocultural theory relevant to the study are overviewed. Approaches to education consistent with sociocultural theory are described, including the notion of a community of inquiry (Wells, 1999, 2001a, 2001b) central to the present study.

The third section of this chapter focuses on children's interests and inquiries. It appears that studies have rarely focused on children's interests, or the knowledge that teachers may need to build curriculum and pedagogy on children's interests and inquiries. However, studies on children's "informal" learning provided insight into the topic of the present study. It should be noted that much of the literature reflects

western cultural perspectives, until the notion of "funds of knowledge" (González, Moll & Amanti, 2005a) is introduced. This concept provided a framework for reporting the study's findings consistent with a way to present culturally-valued knowledge (Case, 1996) from a sociocultural perspective that also recognised the diverse nature of children's interests and inquiries.

Curriculum and pedagogy based on play

Much has been written internationally about the pervasiveness and benefits of play for young children's learning, and the ways that children engage in play in differing contexts (e.g., see Saracho & Spodek, 1998). Yet, the literature is complex and contradictory (e.g., see Dockett & Fler, 1999; MacNaughton, 2003, 2005). Play is both a social and cultural construct and a social practice (E. Wood, 2004) that has defied a simple definition. Moreover, Ross (2000) claimed that the role of play in children's learning has been "popularly misunderstood" (p. 139) by adults who relied on their own memories of schooling to criticise unstructured curriculum. Without a sound foundation of professional knowledge, many employed in the sector have also perhaps struggled in their ability to teach through play and rationalise and explain its role in children's learning (see Bennett, L. Wood & Rogers, 1997; Hedges, 2000; E. Wood, 2004). Studies in both the United Kingdom (UK) and NZ suggest even qualified teachers have grappled with the notion of play without developing some clear understandings, and found it difficult to synthesise beliefs about play with their eclectic teaching practices (e.g., Bennett et al., 1997; Jordan, 2003). For the purposes of the present study, drawing on Dockett and Fler's (1999) analysis of differing theories of play, play is defined as a meaningful activity that children choose to participate in, that involves children in physical, cognitive and communicative efforts in social and cultural contexts.

In NZ, early childhood services have grown rapidly in the past 20 years. However, the relatively recent growth in a research base means that philosophies and policies often guide practice in the absence of research evidence available to inform decision-making. The dominance of philosophy and policy is also evident in teacher education provision (Kane, 2005). Current early childhood literature reinforces the dominance of play in children's learning (Anning, Cullen & Fler, 2004; Broadhead, 2006; G. Walsh, Sproule, McGuinness, Trew, Rafferty & Sheehy, 2006). Play as the basis of

curriculum and pedagogy frequently draws on developmental psychology as an overarching theoretical framework. Basing play provision largely on Western theories and models of child development and learning, and understandings of associated learning and teaching practices, is potentially problematic and may not be appropriate in some contexts and communities (Brooker, 2002; Cannella, 1997; S. Farquhar & Fler, 2007).

"Learning through play" is a popular expression used frequently to describe early childhood pedagogy. E. Wood (2004) identifies that research evidence has demonstrated that through play, children learn to communicate, interact with others, be creative and learn thinking and problem-solving skills. Such findings support the emphasis of teacher philosophy and practice on play. Consequently, the quality of the physical environment has become an over-riding consideration in ensuring children have rich learning experiences (E. Wood, 2004). This quality is determined largely by teachers' knowledge and understandings (Bennett et al., 1997; Brownlee & Berthelsen, 2006; Frost, Shin & Jacobs, 1998). E. Wood (2004) defines the pedagogy of play as "ways in which early childhood professionals make provision for playful and play-based activities, how they design play/learning environments, and all the pedagogical techniques and strategies that are used to support or enhance learning through play" (p. 19). While provision of abundant resources and space, organised well to promote integrated learning experiences, has been a focus of early childhood teaching and learning environments, pedagogical aspects such as how teachers interpret children's interests outside that of the play environment, or identify how play is representative of children's interests, has not been well-investigated. A notable exception in terms of what might be interpreted as children's interests is the teacher-researcher work of Gallas (1994, 1998) and Paley (1981, 1992, 1999).

As a further specific example of the complexity of ideas about play, Youngquist and Pataray-Ching (2004) suggest that in order for curriculum to be interpreted as educational and meaningful, a distinction between "inquiry-play" in the educational setting and "play-in-outside-contexts" is useful. However, the present study does not agree that children's play should be categorised in these two ways, as the interplay between them is very important. Children's play in other settings is also likely to represent aspects of their interests and inquiries that may not be able to be expressed

in an early childhood setting and should not be overlooked by such a distinction. As Andrews and Yee (2006) and Thomson (2002) point out, children's play and learning in outside contexts is rich with possibility *for* the educational setting, if teachers recognise and respond to it. If a redefinition were required, it might be to classify all play as inquiry.

Refuting Youngquist and Pataray-Ching's argument demonstrates that the non-compulsory, non-prescriptive, unstructured and play-based notions of early childhood education have left it open to many viewpoints and debates. Alongside a focus on play, constructs such as child-centred, child-initiated, holism, developmentally appropriate practice and integrated curriculum, also deeply rooted in developmental psychology, have also dominated western early childhood teaching (Chung & D. Walsh, 2000; Fleer, 2003; Tinworth, 1997) and often merged with each other in interpretations. The present study does not have space to explore these notions, but notes that these philosophical and theoretical standpoints create challenges for sociocultural approaches to curriculum and pedagogy consistent with current interpretations of *Te Whāriki* and other approaches to curriculum internationally, such as the popular ideas of Reggio Emilia (e.g., Rinaldi, 2006).

Teachers as key curriculum decision-makers

A contemporary approach to curriculum encourages a critical stance as to the theories and values underpinning curriculum (Cannella, 1997; Dahlberg, Moss & Pence, 1999) and recognition of curricula as complex, contested, contextual and culturally-bound (Joseph, 2000; MacNaughton, 2003; Ross, 2000). Consequently, teachers are key curriculum decision-makers (Connelly & Clandinin, 1988; Grundy, 1994). The example of *Te Whāriki* provides a case in point. Grundy identifies curriculum as a series of phenomena that are constructed and reconstructed on a moment-by-moment basis during pedagogical relationships. Teacher decision-making is not impulsive; it is a conscious process that draws on understandings about children, curriculum, pedagogy and context (Nuttall, 2004). In implementing *Te Whāriki*, the knowledge teachers draw on to inform their interpretations of interactions and teaching and learning may involve many spontaneous moment-by-moment events. Moreover, such a pedagogical view of curriculum presumes the active participation of learners in

negotiating and constructing curriculum, and the willingness of teachers to reflect on and articulate their judgments.

Through highlighting elements of the discourse of play as central to young children's learning, the highly interpretive nature of a curriculum for young children, for whom learning comes naturally from every experience, is apparent. Learning is dependent on teacher knowledge and responsiveness, and the quality of social relationships.

Sociocultural theory in curriculum and pedagogy

Sociocultural approaches to research study learners' participation in activities that involve both the individual's contributions as well as those of other people, cultural institutions and artefacts. Originating with the seminal ideas of Vygotsky (1978, 1986) about the social processes of learning that enable humans to appropriate culture, sociocultural theories of learning and teaching view children's cognitive activity as occurring primarily through social interactions. Knowledgeable peers and adults in multifaceted roles support children to explore and construct new understandings, knowledge and skills and develop dispositions towards learning. In contrast with cognitive-constructivist theories, this is a dialectic process rather than a staged process of development.

Rogoff (1998) identifies two major branches of sociocultural theory that have developed from Vygotsky's idea that meaning making is central to learning. The first, commonly known as sociocultural, emphasises language and forms of understanding embedded in social and cultural contexts and practices, viewing these as cultural tools and resources available to learners. Within this branch, a perspective identified as social-constructivist emphasises learning activity within relationships, where those with knowledge or experience lead the learning of others. This perspective recognises the importance of social and cultural processes. The second branch Rogoff identifies is that of cultural-historical activity theory. These theorists emphasise practical activities and cultural practices in shaping learning. Both groups of researchers have developed Vygotsky's ideas by enabling researchers to focus on sociocultural activity as the unit of analysis and emphasising the learning inherent in any context. These theories also foreground the importance of recognising and building on children's family and community learning and knowledge. Teachers need to establish and

engage with children's prior cultural and conceptual understandings to promote learning (Pollard, 2005).

The present study locates itself primarily within the social-constructivist domain of sociocultural theory as Rogoff (1998) described it. The social-constructivist approach developed Vygotsky's focus on language as the most important cultural tool, from individual words to dialogue as a unit of meaning making activity to research. This perspective has also brought to prominence the importance of teaching and learning relationships and interactions that mediate learning (Bennett et al., 1997; Hedges, 2000). Such an interpretation is consistent with a mix of the social-constructivist and transformative paths as described by S. Edwards (2003), as the outcomes of pedagogical relationships can result in transformation and change to knowledge and action. While acknowledging that culture and context impact on children's learning inextricably from the social interactions, pedagogical relationships and dialogue are the primary foci of the present study.

The nature of knowledge

Multiple theoretical perspectives can be drawn on to inform education. A sociocultural perspective of knowledge highlights kinds of knowledge valued by communities and cultures (Case, 1996). However, the nature of knowledge, and its contested nature, has become a source of debate (Bereiter, 2002; Hedegaard & Chaiklin, 2005), including in relation to sociocultural early childhood curriculum and pedagogy (Anning, Cullen & Flear, 2004).

Some writers have drawn attention to the different metaphors that underpin perspectives of knowledge, based on contrasting views on learning. Sfard (1998) distinguishes between the acquisition metaphor and the participation metaphor. The former views learning as an individual pursuit and is derived from cognitive-constructivist theories of learning; the latter regards learning as occurring between people in social and cultural contexts and is supported by sociocultural theory. In response to criticism that learning rather than knowledge is emphasised in both metaphors (e.g., see Bereiter, 2002), Paavola, Lipponen and Hakkarainen (2004) argue for a third metaphor, that of knowledge creation. In this metaphor, Paavola et al. emphasise the dynamic nature of learning for transforming knowledge and

practice. Of further significance to the present study, the knowledge creation metaphor is linked to inquiry learning. In this way, the present study argues that there is a link between participatory learning co-constructed in relation to children's interests and knowledge creation (and building). Such a contention is supported by Bereiter who argues that "both learning and knowledge building ought to be meaningful" (p. 255) and that both are collaborative efforts. In this way, both everyday and conceptual knowledge may be built.

Theories of formal and informal learning

A further possible classification of particular importance to the present study appears to occur in the theoretical literature between theories of "formal" and "informal" learning. For instance, well-known theories of formal learning such as Piaget's theories of cognitive development, Bandura's theories of social cognition, Erikson's of social and emotional development, and Ainsworth's of attachment are informants to early childhood curriculum and pedagogy. Many of these theories derive from the legacy of developmental psychology that has been heavily critiqued as an informant to early childhood education (e.g., Cannella, 1997; S. Farquhar & Flear, 2007; Lubeck, 1996). In addition, formal theories such as Bronfenbrenner's ecological theory and aspects of Vygotsky's sociocultural theory are also well-established, and have been developed to account for learning that occurs inside and outside of formal education contexts (Rogoff, 1998).

Bronfenbrenner's (1979) theory describes the "microsystem" of children's homes and early childhood centres as central to children's learning. This is supported by connections between these and wider social networks in the "ecosystem", for example, the support of family and friends, and "macrosystem", the beliefs and values of the wider society. This theory has similarities with theories of social and family capital discussed later in this review.

Vygotsky's concept of a zone of proximal development (ZPD) has become popular, yet perhaps suffers from narrow interpretations (Kozulin, Gindis, Ageyev & Miller, 2003). Chaiklin (2003) explains Vygotsky's three uses of the notion. Firstly, it describes developing psychological capabilities in children. Secondly, applied to educative approaches, it explains the difference between children's unaided

performance and performance with assistance. Thirdly, it was used as a metaphor to represent a zone where children's everyday understandings interact with conceptual knowledge provided by mediators of learning, such as teachers. Kozulin et al. note that this third interpretation is less well-known and that understanding children's everyday and conceptual knowledge warrants further research investigation. Further, the ZPD can be viewed as a dynamic, creative zone during mediated interactions (Lidz & Gindis, 2003).

Vygotsky's theory discussed the mutual influence and co-existence of scientific (i.e., formal or conceptual) and everyday (i.e., experiential) concepts in children's learning. Vygotsky (1986) described how children learn "everyday" or "spontaneous" concepts and gradually, through play and language, develop and recontextualise these into "scientific" concepts. Vygotsky believed that children's informal daily interactions provide a bank of experiences to draw on to develop more formal, scientific, conceptual knowledge in later schooling. Inagaki and Hatano (2002) provide evidence that children's everyday experiences with people provide the basis for beginning to understand scientific ideas in biology, physics and psychology, and label these as "naïve" understandings. These authors state that children spontaneously pay attention to human interactions, and within "naïve biology", children reveal a personification-based understanding of the world; attempting to understand something new by assuming it to be human-like. Further, Vygotsky believed that practical activity was important for development. The notion of everyday concepts and practical activities as important in children's spontaneous early learning leads to consideration of other potentially relevant concepts that are referred to within this study as theories of informal learning, and are therefore grouped together in the next substantive part of this review.

Theories of children's informal learning, consistent with a sociocultural perspective, that are important to an examination of interests and inquiry-based approaches to curriculum and pedagogy in the present study are: views of learning as occurring through intent participation, working theories, dispositions, intersubjectivity and reciprocal and responsive relationships. These ideas, and issues pertinent to the present study such as defining curiosity and cultural tools and events, are now overviewed.

Learning through intent participation

Language organises human activity (Säljö, 1998). Through the mediation of people and cultural tools, individuals make sense of new concepts, learning and internalising these through thought (Kozulin, 2003). Such views stress the importance of teaching and learning relationships and interactions, whether or not they were intentionally designed to be educational.

Many situations in which children engage are not directly instructional (Rogoff, 1998). Learning may occur simply through observation and participation. This view of learning may be expressed as learning through "intent participation ... a powerful form of learning", (Rogoff, Paradise, Arauz, Correa-Chávez & Angelillo, 2003, p. 176). Rogoff et al. describe how humans learn by observing and listening in on others as they collaborate in shared tasks, in flexible and complementary roles. Observation of others' activities, as an important way in which children learn, is neither incidental nor passive. Language is a vital cultural tool employed when both information sharing and questioning to explore ideas occurs.

In many communities, children learn through observation and participation with adults in cultural activities. Lave and Wenger (1991) termed this "legitimate peripheral participation". Sometimes children take responsibility for involvement, and the experiences are structured to support this involvement; at other times children simply observe, preparing to participate on later occasions (Rogoff et al., 2003). In this way, children also become exposed to other cultural tools, events and artefacts relevant to their culture and practices (Rogoff et al., 2003). From engagement in social and cultural activity, learning is eventually internalised by children, and represented and re-created as opportunities arise to do so. However, while Rogoff and others have investigated these cultural practices, research has rarely addressed which of these cultural practices, events, tools and artefacts might be of most interest to young children, and which members of their families and communities might influence these interests.

There is a clear link between learning through intent participation and the concept of constructing curriculum, in its widest sense, based on interests. Without the activities in which learners engage having some intrinsic interest and importance, the

motivation to learn in this way would not be present. As Rogoff et al. (2003) point out, such learning often occurs in authentic situations in which children are very eager to participate. Motivation is intrinsic to achieving real participation goals. Moreover, observing others may stimulate the interests of learners through extending their experiences and understandings. Certainly, as Brennan (2005) argues, children observing, listening to talk about, or collaboratively building understanding of such experiences also demonstrates that certain activities and events have cultural significance to others.

Further, Rogoff (1998, 2003) argues that human development and learning occur through a transformation of participation in sociocultural activities. Because humans are constantly changing and developing their understandings, they themselves change, likely observed in altered involvement in similar activities or events in the future. In doing so, they also transform current cultural practices as they alter them to fit a situation. A transformation of participation means that individuals, the people they are with and their cultural institutions, influence ongoing creative development of knowledge.

Cognition therefore, according to Rogoff (1998), is a dynamic, collaborative process that requires researchers to investigate how children's understandings change through participation with people in cultural activity. How this might be theorised in early childhood education appears to have not been explored in the literature. Moreover, children's changing knowledge and understandings are likely to reflect children's relatively limited experience, and rather than developing everyday and conceptual knowledge in a coherent way, may involve the development of working theories.

Working theories

Working theories, alongside dispositions, were noted earlier as the indicative learning outcomes of *Te Whāriki*.

In early childhood, children are developing more elaborate and useful working theories about themselves and the people, places, and things in their lives. These working theories contain a combination of knowledge about the world, skills and strategies, attitudes, and expectations. ... As children gain greater experience, knowledge, and skills, the theories they develop will become more widely applicable

and have more connecting links between them. Working theories become increasingly useful for making sense of the world ... (Ministry of Education, 1996, p. 44).

The term "working theories" is also included in one of the goals for the strand of exploration "[children] develop working theories for making sense of the natural, social, physical, and material worlds" (p. 82). The notions of intent learning (Rogoff et al., 2003) and emergent inquiry (Lindfors, 1999) are congruent with the notion of working theories.

From birth, virtually all children develop the ability to engage others in their attempts to make sense of the world [T]his process occurs naturally in children's daily interactions with others. This view sees the emergent inquirer as actively and continuously engaged in constructing her understanding of inquiry acts: purposes, expression, participants, contexts (Lindfors, 1999, p. 49).

However, given the Ministry of Education's decision to remove the theoretical endnotes included with the draft version of the curriculum (Ministry of Education, 1993) in the final document, the concept of working theories was not explicated. Nor was it defined in a recent article about children's working theories (Simmons, Schimanski, McGarva, Cullen, & Haworth, 2005); in which examples were provided of how the notion might be interpreted through the data presented. In an attempt to redress this gap in the literature, this section explores the origin and meaning of the term, in order to later justify the interpretation of working theories as viewed within the elements of a "spiral of knowing" (Wells, 1999) in the present study.

A reference to Claxton (1990) as the source of the theoretical basis of working theories is made in the draft of *Te Whāriki*. Making links to Claxton's work is through the way that knowledge, skills and attitudes are seen as interdependent and through his notion of "mini theories" (Ministry of Education, 1993, p. 152). Further, the notion was seen as having links to the idea of reciprocal and responsive relationships in which children developed their own knowledge and theories, "rather than knowledge 'handed down' from above" (M. Carr, personal communication, May 2, 2006).

Claxton (1990) developed the notion of minitheories based on the idea of implicit theories, arguing that much knowledge is tacit, that is intuitive and intangible, and therefore humans find it difficult to articulate the basis of their knowledge and understandings. Claxton suggests that implicit theories come largely from three sources: first-hand experience of the physical world, experiences in the social world, and thirdly, both the explicit and hidden curriculum. Therefore, children's experiences in early childhood settings are likely to inform their developing theories as they try to understand the world and reveal themselves in the experiences they choose to participate in.

Claxton noted that implicit theories are not one large, coherent body of knowledge, but "a collection of lots of different, piecemeal, purpose-built 'minitheories'" (p. 8) that are used to interpret new information in light of current experience and understandings. Sometimes, instead of any deep understanding, learners just grasp pieces of knowledge regarded as relevant and interesting, without any overall coherence in knowledge or understanding. Claxton states that with minitheories there is also the possibility of seeking personal meaning or insight, sharing this, and building further collaborative understandings and revisions to minitheories.

Claxton argues that in the early years of life, through gradual improvement, minitheories become more effective, comprehensive and appropriate. A second aspect involves the linking up of originally separate minitheories. As young children gain more and more experience, so the accumulation of minitheories continues in a spiral manner. Through collaboration with parents, siblings, peers or teachers, minitheories become richer and more differentiated. Every experience is an opportunity to progress minitheories and also to develop strategies for learning; here a link to dispositions for learning is evident.

As noted, the notion of working theories has been little explored in relation to *Te Whāriki*, yet is a perspective of informal learning that has much potential in an investigation of children's inquiries and interests. For the purposes of this study, working theories provide a perspective for analysing children's learning and thinking. The notion of minitheories is perceived as the knowledge and skills components of working theories, with dispositions comprising the third element.

Dispositions

The concept of dispositions originated in the psychological literature on cognition (see Katz, 1993; Perkins, Jay & Tishman, 1993). Recently, a sociocultural perspective of dispositions has been argued (M. Carr & Claxton, 2002; Claxton & M. Carr, 2004) that accounts for multiple contexts and influences on children's learning. The perspective also accounts for the views of family and community members, and children themselves, alongside professionals, such as teachers, about children's learning. This perspective has had a major influence on the learning stories assessment practices related to *Te Whāriki* (M. Carr, 2001a; Ministry of Education, 2004). In learning stories, competent learners are seen to develop positive dispositions for learning linked to the strands of *Te Whāriki* such as curiosity, concentration, persistence, contribution and communication (M. Carr, 2001a).

Dispositions are a debated construct as to their suitability for describing and assessing learning (e.g., see Bone, 2001; Katz, 1993, 2002; Sadler, 2002). If viewed as residing in individual inclinations, the impact of pedagogical relationships may be underemphasised in theories of dispositional cognition. Further, a limitation in the literature related to *Te Whāriki*, which may relate to children's wide-ranging interests, is other dispositions might relate to domain learning and knowledge construction, for example, the disposition to think mathematically (Anning & A. Edwards, 1999) or scientifically (Hedges, 2003a). Likewise, teachers can view children as emergent learners (Cullen, 1998) or with specific learning orientations such as "being nearly five" (M. Carr, 2001b) or being active, emergent inquirers (Lindfors, 1999).

Curiosity

The role of motivation in inducing conceptual change has largely been neglected in literature that attempts to investigate cognitive and affective components of children's learning (Inagaki & Hatano, 2002). Therefore, even when criticisms of dispositions are taken into account, motivation in the form of intent participation and a disposition towards curiosity are vital in investigating children's interests and inquiry. The lack of research on children's curiosity was noted by Tizard and M. Hughes (1984) over twenty years ago and reaffirmed recently by Chak (2007).

Curiosity is a multi-faceted concept, theorised as combining features such as motivation, exploration, novelty and creativity (Chak, 2007). Inquiry and curiosity can be interpreted as either to take an interest in something occurring, or to be interested in something self-initiated and self-absorbing, and want to know and explore more.

Children's inquiry acts provide a window to their thinking, allowing us to glimpse what they make sense of and how they are doing it, how they understand and how they use others to help them (Lindfors, 1999, p. 16).

Curiosity and inquiry are supported by adults who respond meaningfully to children's inquiries (Henderson & Moore, 1980). Moreover, Sussman (1989) argues that adults act as mediators in maintaining motivation, introducing children to new experiences, sustaining exploration and providing emotional security during inquiry episodes. Such a view is consistent with sociocultural perspectives of pedagogical relationships as central to teaching and learning, and the mutual effect of cognition and affect. Chak (2007) studied teachers' and parents' understandings of curiosity and exploration, to understand how they might then support children's inquiry. Both groups had a positive perception of curiosity in young children, but teachers were keener than parents to encourage it.

Sternberg (1994) suggested that adults who respond to children's inquiries and encourage exploration will foster conceptual understandings. Hence, the early childhood setting may provide opportunities outside the home to encourage, generate, continue and sustain inquiry and knowledge building. Yet, curiosity alone and collaboration with others is insufficient. It is likely that inquiry requires other dispositions that may include involvement, enthusiasm, perseverance, risk taking, and communication. This would then link curiosity and inquiry beyond the strand of well-being in *Te Whāriki*, as the learning story approach (M. Carr, 2001a) tends to delineate it (see p. 4), to weave itself with all other strands (belonging, contribution, communication and exploration) and associated dispositions. Further, to engage in learning that involves working theories and dispositions requires attention to the processes of learning, and therefore suggests that participants need to have some shared understandings and engagement and interconnectedness in authentic learning and teaching.

Reciprocal and responsive relationships

Intersubjectivity is about developing shared purpose and meaning among participants in teaching and learning experiences. This definition fits well with the notion of inquiry and is essential to build curriculum from children's authentic interests. From a Vygotskian perspective, the effort to achieve intersubjectivity means that participants each contribute, although not necessarily equally, to the learning exchange. Moreover, children may test out developing ideas (i.e., working theories) with adults, wanting adults to simply listen and reflect the child's thinking and understanding.

Intersubjectivity also relies on children and teachers knowing each other well in order to be responsive. From a sociocultural perspective of pedagogy as "responsive interactivity" (A. Edwards, 2001, p. 166), responsive teaching comes from teachers and children knowing each other well and sharing purposeful learning in positive, reciprocal interactions that have a joint focus; hence the notion of co-constructing curriculum. The foundations of critical thinking and metacognition are also laid in such interactions and support early childhood's integrated experience-based approaches that foster choice, inquiry, initiative and independence.

Reciprocal and responsive relationships imply that intersubjectivity and the opportunity for sustained interactions and dialogue are vital in promoting meaningful learning. Both a range of experiences and the language to support these are essential. Jointly focused attention on something a child has shown interest in or initiated a conversation about helps the child to make sense of the experience and build understanding of the topic of interest.

Meaningful engagement in learning relies on teachers listening closely to children. Yet, as Moss, Clark and Kj rholt (2005) point out, much about "listening" is infused with power relationships and other complexities. Which children are listened to, when and why, and which interests that arise from these conversations are developed in curriculum, requires examination. Further, there are implications for teachers' ability to engage in sustained interactions with children. Conversing with children to create intersubjectivity and act on their understandings and curriculum decision-making may be affected by teacher-child ratios or interpretations of teacher roles (Kontos & Wilcox-Herzog, 1997).

Furthermore, all learning and knowledge construction is situated, that is, an individual's learning is mediated by social relationships, activities, cultural tools and practices. Distributed cognition is a term that describes the shared processes by which this learning occurs and is mediated (Salomon, 1993). For example, dialogue during play facilitates both knowledge construction and the appropriation of complex ideas and cognitive processes. Considerations of reciprocal and responsive relationships and the notion of distributed cognition are important aspects of a sociocultural approach to early childhood pedagogy. Both support the notion of learning as a process of transformation of participation employing cultural tools (Rogoff, 1998, 2003).

Cultural tools, activities and events

Vygotsky (1978, 1986) discussed the role of cultural tools (e.g., language, symbols, resources and equipment) in mediating learning and teaching. Vygotsky supported that learning should be authentic; that is, it should be relevant to the daily life and practices of a child in a community or culture. For example, he maintained that children should learn to read and write in the context of their play, rather than taught letters in isolation. As Jordan (2003) noted, "Vygotsky clearly favoured supporting children's learning in the context of their interests" (p. 35). In early childhood education, these tools include, but are not limited to, physical aspects of the environment such as play equipment and resources.

Of particular relevance to a study of early childhood education, Vygotsky (1978) viewed play, and particularly socio-dramatic play, as a major source of learning, forming a ZPD; that is, play is important for children's potential to behave and act above their current age. He viewed imaginative and symbolic play as a way in which children acted out understandings of real life behaviours (e.g., what parents do), often showing this through the imaginary behaviour of characters and objects used in the play situation. When children engage in socio-dramatic play they assume the actions, language, thinking and emotions of the human roles they are engaging in. For example, to successfully play at being families requires that children have knowledge of family roles and responsibilities and intersubjectivity with play partners. Corsaro (1985) noted that role play can also be an innovative expansion of understandings, a way that children both practise and transform knowledge.

Sociocultural perspectives also suggest children's play provides a way for them to take part in the social life of the adult world before their skills are adequate for real participation (Leont'ev, 1981 cited in Hakkarainen, 1999). Imagined situations, symbolic actions, scripts, roles and rules provide the mediational means for such play as children use cultural tools to interact with peers and adults.

Application of sociocultural concepts to education

Vygotsky and post-Vygotskian scholars have considered sociocultural theory and its applications to education. Early childhood pedagogy has recently developed sociocultural strategies. This chapter now explores some of these ideas, culminating in introducing the concept of a community of inquiry.

Early childhood pedagogy: Current challenges

Pedagogy is a term that has become common in recent discourse, but suffers from being "populated with many meanings" (A. Edwards, 2001, p. 162), involving teachers in "informed interpretations of learners, knowledge and environments in order to manipulate environments in ways that help learners make sense of the knowledge available to them. It is an intense, complex and discursive act, which demands considerable expertise" (p. 163). In addition, pedagogy is influenced by wider issues of history, politics and ethics (Dahlberg & Moss, 2005).

A. Edwards' definition of pedagogy raises important issues related to teachers assisting learners' meaning making. A coherent theoretical framework that provides guidance for teachers to recognise and engage with children's prior experiences and knowledge intersubjectively, in order to collaboratively construct knowledge appears to be lacking in the current literature. Whatever that framework, pedagogical relationships, cultural tools, activities and events that inform it will be significant.

The types of pedagogical relationships reflected in sociocultural ideas are participatory, mediational and allow for the flexible and changing roles of participants as teachers and learners. Three pedagogical approaches discussed in the literature are scaffolding (Berk & Winsler, 1995; Jordan, 2004), guided participation (Rogoff, 1990, 2003) and co-construction (Jordan, 2004; McNaughton, 1995; Valsiner, 1993). Each encourages an active role in the meaning making process.

Scaffolding describes the process of providing temporary guidance and support to children within their ZPD as they increase competence in areas of development and learning. In its original sense, the goal of scaffolding was to foster the learner's autonomy and independent mastery in problem-solving. Rogoff (1998) criticises the notion due to its weighting of control to the adult and focus on individuals as the unit of analysis. Yet, Stone (1993) describes scaffolding as "a much more subtle phenomenon, one that involves a complex set of social and communicative dynamics" (p. 80).

Rogoff (1990, 2003) developed the concept of scaffolding further in her construct of guided participation, consistent with the view of children learning through intent participation. Guided participation provides more focus on the role of children as active agents and communicators in their own learning and development than scaffolding. Rogoff (1990) considers children as "active in their efforts to learn from observing and participating with peers and more skilled members of their society, developing skills to handle culturally defined problems with available cultural tools, and building from these givens to construct new solutions within the context of sociocultural activity" (p. 2). She considers guided participation as essential to the collaborative processes in this approach and that intersubjectivity underlies these processes. More experienced people guide learners' involvement in activities, often participating alongside them. The learners may also take the initiative to contribute to the shared tasks (Rogoff et al., 2003). Later, using the model they have been exposed to, learners become the experienced others that facilitate similar learning for new learners.

Co-construction (Valsiner, 1993) views development and learning as occurring through complex and dynamic exchanges between children and their actions to make sense of the world, and the social and cultural processes in everyday activities. These two aspects are both dependent on each other and also part of each other. The process of co-construction holds a potentially empowering approach to encouraging both adults and children, including groups of child peers, to have an active role in teaching and learning experiences and negotiate curriculum.

The role of peers in children's learning

While research has paid some attention to the role of adults in children's learning, less has occurred in relation to the role of child peers (Rogoff, 1998). Verba (1994) observed three groups of children aged 17 months to 4 years in small groups within their early childhood centres playing with manipulative materials. Patterns of interaction were classified into modes of socio-cognitive collaboration. The same interactive patterns were found in each group, despite infants' limited verbal communication capacities. Verba found that "the relative equality of partners with respect to competence and social power in peer interaction allows processes of co-construction to emerge that differ from those characterising adult-child interaction" (p. 126). Verba's study of child peers suggested that co-construction encourages participants to develop shared meaning. Rogoff (1998) claimed that peer relationships enable children to explore ideas in a more equal relationship than with adults for two reasons: the power differential between adults and children that impinges on reciprocity; and that adults often constrain children's exploration by imposing limits on it.

The role of peers in children's learning has been investigated in a few other studies, mostly investigating child peers with disabilities, but remains a largely-unexplored area of research (Fabes, Hanish & Martin, 2003), particularly in areas where children are more expert than adults in guiding participation in culturally-valued activity (Rogoff, 1998). The opportunities that early childhood centres afford for children to learn from each other are potentially immense and may differ from learning with adults. For example, children may communicate with peers, perhaps through negotiation and conflict resolution, in ways different to interactions with adults. While the literature is incomplete, Rogoff further suggested that engagement with each others' thinking may be a vital point of connection in promoting knowledge building. In the present study broadening the notion of peers to include siblings provided further insights into how children collaborate and what interests they share and develop together, particularly about family roles. In addition, this approach supported Rogoff's suggestion that research needed to focus on peer collaboration and engagement in a range of situations that are not primarily intended to be instructional.

Learning communities

Children engage in participatory and collaborative learning in a range of settings. The metaphor of learning communities has developed from anthropological literature (Grossman, Wineburg & Woolworth, 2001) and has been used extensively recently in all education sectors to confer a sense of belonging and shared purpose among a group of people. A focus on co-constructing knowledge within sociocultural theory has led to various concepts of learning communities. As Hill, Stremmel and Fu (2005) point out, the centrality of relationships and teacher decision-making in such communities makes these communities *for* learning as well as *of* learning.

The term "community of learners" (Rogoff, Matusov & White, 1996) emphasises that learning is commonly viewed as collaborative participation in shared experiences, does not assume that the community is always structurally organised and does not distinguish between adult and child participants (Rogoff et al., 1996; Rogoff, 1998). It highlights participation, intersubjectivity and that each participant brings valued knowledge and experience to new collaborative learning activities. By focusing on the process and dispositional elements of teaching and learning, experts and novices learn to cooperate and share their knowledge and skills, motivate and support each other, and develop respect and responsibility in their relationships (Rogoff, 1998). The result is changes to individual and shared understandings, and the practices and artefacts that may derive from these.

Rogoff (1998) suggests that a focus on learning communities reduces the assumed dichotomy of teacher-led and child-initiated models, instead highlighting the potential collaboration of the participants, and is a model well-suited to the theoretical notion she favours of transformation of participation. Therefore, a learning community model for early childhood education may potentially resolve philosophical tensions about child-initiated and interests-based curriculum revealed in studies of children's play (e.g., Bennett et al., 1997) and highlight collaboration and co-construction as a basis for interests-based pedagogy.

The concept of a collaborative learning community tends to imply a positive, warm and co-operative environment and is not unproblematic (see A. Edwards, 2005; Wisneski & Goldstein, 2004). A. Edwards (2001) cautions that such wide application

of the term "community" could diminish its utility. Conflict, disagreement and actively working on shared understandings may be critical to the development of dynamic learning communities (Orland-Barak & Tillema, 2006). Therefore, the present study investigated further notions of learning communities for their suitability to the present study.

Community of practice

Wenger's (1998) term "community of practice" describes learning as an active process of meaning-making and participation in the experiences and practices of knowledge communities. Wenger's notion places learning within participation in the contexts of social experience that are an integral part of daily human life. The outcome is constructing an identity and sense of belonging in relation to the values and goals of the communities.

Wenger suggests that people interact together in a range of activities to learn the accepted beliefs, knowledge and practices of communities and cultures. Established community members support newer members in an apprentice-like fashion to learn expected patterns of behaviour and practice, and the knowledge underpinning these. These forms of knowledge and practice are often secured through artefacts. In early childhood education, for example, teachers may participate in curriculum planning discussions that reinforce established practices through both the dialogue occurring and the artefacts such as assessment materials and other documentation.

Wenger's notion allows for conflict between community members as established practices are challenged by others. Early childhood settings develop their own unique patterns of relationships, communications and practices that become accepted in that context. Yet, many such reified practices can indeed be challenged, such as the learning environment, teaching practices or routines. Recently, the concept of a community of practice has been applied to groups of teachers engaging in professional development and inquiry (e.g., Aitken, 2006; Cullen, 2004; Liebermann & Miller, 2001). Certainly, teams of teachers engaging in examination of their practices together may enhance professional identity and relationships and effect long-term change in a way that individual reflection may not. Nevertheless, an

external viewpoint from outside the community may also enhance challenge and change, and create innovation in practices.

Therefore, the notion of a community of practice is somewhat limited to participation viewed as a form of apprenticeship into an existing culture that primarily changes internally. Moreover, scholars raise several further flaws in relation to the present study. Firstly, it ignores that participants bring to the community prior knowledge and experience (Colley, James & Diment, 2007). Secondly, it lacks explanation for innovative knowledge creation (Paavola et al., 2004), that is, the kind of knowledge that children and teachers are likely to co-construct through interpersonal learning in the spontaneous teaching and learning of an early childhood setting (Colley et al., 2007; A. Edwards, 2005). Thirdly, it disregards external influences such as macro level policy that may impact on the community, something early childhood communities continually have to take account of. Finally, it assumes individuals progress forward within the community, when individual trajectories are much more complex and may involve regression (Colley et al., 2007). For these reasons, the present study looked to another notion of learning community to guide the study.

Community of inquiry

The notion of a community of inquiry began in philosophy of education as a dynamic, dialogic pedagogy that enabled groups to work on problem-solving through critical thinking. Key notions in dialogic inquiry are that of respect for the members of the group and their viewpoints, building a sense of community, meaning making and co-construction of learning (Skidmore, 2006). These are all consistent with sociocultural theory. Wells (1999, 2001a, 2001b, 2002) focuses the notion of participatory learning on inquiry. Through this notion, two key concepts of the present study may be brought together: learning as a transformation of participation built on intrinsic interests and associated dispositions, and inquiry as a pedagogical approach. Wells' community of inquiry concept was developed from the belief that inquiry is relevant to all learning situations across education sectors and includes students, teachers and researchers (Wells, 2002). Hence, it was applicable to the varying contexts of inquiry co-constructed between children, teachers and a researcher in the present study.

The concept of a community of inquiry that Wells advocates began from researchers observing the importance of children's "real questions" (Wells, 1999, p. 91), and ways in which these questions were responded to in co-constructing meaningful learning. This focus is consistent with the view of learning as intent participation and involving inquiry-based interests. Through inquiry and progressive discourse (Bereiter, 2002), knowledge is co-constructed. Wells' (1994, 1999) examples are all from the domain of science, an area of focus at that time in United States policy and curriculum development. Skidmore (2006) questions how the approach might be applied to other domains and suggests that the concept needs expanding. In the context of the present study, the notion of a community of inquiry is extended. Key ideas form a framework that is not domain-specific and account for affective as well as cognitive learning in the early childhood education sector.

The communities of learners, practice and inquiry models each acknowledge the sociocultural origins of knowledge and allow for the flexible and changing agency of participants within the learning and teaching processes. Of these models, the community of inquiry is suggested as being most consistent with the sociocultural view of children as capable and competent. It emphasises the role of children's prior knowledge, interests and inquiry, implies that working theories can be developed and explored, and stresses both the central role of language as a cultural tool in dialogic inquiry and the intersubjective nature of the reciprocal and responsive relationships highlighted in early childhood pedagogy. Further, it enables curriculum and pedagogy to explore co-constructed, dynamic and open-ended approaches. Therefore, this model provided an approach that could be used in the various sectors, relationships and contexts of the present study, and was also consistent with the theoretical perspectives underpinning the study.

The primacy of dialogue in co-constructing inquiry

Wells (1999) draws on the ideas of Vygotsky, Bakhtin and Halliday to argue that language is the most powerful cultural tool. Language can be both a tool of communication and create and mediate shared understandings. This claim highlights the importance of reciprocal and responsive pedagogical relationships in order to create and sustain dialogue in a community of inquiry. A relationship approach to pedagogy consistent with a sociocultural perspective supports that inquiry learning

and co-constructing knowledge are processes of meaning-making (Dahlberg et al., 1999).

To highlight dialogue in early childhood education, Pramling (1996) analysed teacher-child conversations with 3-6 year olds. Her research supported that in constructing new understandings, children bring relevant knowledge to learning situations. Such knowledge might contribute to working theories that children test out the applicability of in the new situation. Pramling also claimed that programmes developed from children's interests and experiences assist children's cognitive and metacognitive development by developing children's awareness of their learning strategies. In that case, dispositions, as highlighted in *Te Whāriki*, may be one of these strategies. Further in relation to metacognition, Inagaki and Hatano (2002) claim that awareness of learning strategies is a necessary condition for conceptual learning and knowledge building.

Wells (2001b) claims that dialogue is "the discourse of knowledge building" (p. 185). While Wells states that knowledge building also takes place through other modes, the primacy of dialogue between people is fundamental to the concept of inquiry. Wells (2002) views learning-and-teaching as inseparable and as occurring through dialogic co-construction. This hyphenated term has parallels with the Māori term *akō* (see p. 5). Dialogue with adults or peers maximises children's learning during participation in play. Dialogue is also likely to be an important learning mechanism as young children are not yet capable of accessing written material in other cultural tools such as books and the Internet without the mediation of adults' or more skilled peers' interpretation (Hedges & Cullen, 2003). Further, other writers argue that a dialogic mode of engagement with learners may reduce outcome disparities for diverse learners (e.g., Skidmore, 2006).

Wells' concept suggests teachers and learners together explore issues to which there are no predetermined answers or outcomes. This accords with a curriculum that emerges from children's interests, which are likely to be broad and varied. This further supports that co-construction (Valsiner, 1993) may be a promising pedagogical approach within an early childhood community of inquiry where co-constructing knowledge occurs collaboratively.

"The emergent inquirer learns from actually engaging in inquiry" (Lindfors, 1999, p. 110). Researching children's inquiry is fundamental to finding out how children learn and has important implications for early childhood learning environments, curriculum and pedagogy, and teacher preparation and professional learning. Children's continuing inquiry and knowledge construction is dependent on the meaningful responses of the adults in their lives. Yet, as noted, a coherent theoretical framework in which to ground these ideas, and provide pedagogical guidance for teachers, is necessary in early childhood education.

A "spiral of knowing"

One metaphor Wells employs in the community of inquiry model might be applied to early childhood education. Wells (1999, 2001b) describes a "spiral of knowing" as being central to an inquiry oriented curriculum. Each spiral begins with experience and adds information gained that contributes to understanding through a process of knowledge building. The outcome of knowing is action. Such a spiral, when coupled with the notion of working theories, illustrates that learning builds on foundational (i.e., prior, everyday) knowledge and is an interpretive and incremental process. Each element of the spiral is now described further.

Experience is a person's participation in cultural activities, and in the actions and social interactions through which they occur. However, Wells (1999) makes it clear that it is not the experience per se, but the meanings that are constructed in the course of participation in experiences that are crucial. Experiences may be "limited and repetitive ... or diverse and richly varied" (p. 84), a statement that has implications for the quality of children's experiences in early childhood education. Experiences are the fundamental source of the meanings and representations on which all knowledge builds. Information comes from other people's interpretations of experiences and meanings, for example, from informal conversations through to reference books. Information can be varied. Whether or not it will be remembered and acted on depends on how much it connects with a person's experiential meaning and can be integrated into their current knowledge of the world.

Knowledge building involves developing meanings collaboratively and publicly in an active and integrated way. Individuals engage in "meaning making with others in an attempt to extend and transform their collective understanding ... of a jointly undertaken activity" (Wells, 1999, p. 84). Understanding has a relationship with knowledge building and experience, but is more personal than knowledge building, and has a relationship with action. Action is the final dimension of a cycle of knowing and commonly also involves improving artefacts. In summary:

Knowing starts with personal experience which, amplified by information, is transformed through knowledge building into understanding, where understanding is construed as knowing that is oriented to action of personal and social significance and to the continual enriching of the framework within which future experience will be interpreted (p. 85).

Thus, individuals, the social environment of learning, and the cultural practices involved, are continuously transforming through cycles of learning. Further, echoing notions such as Rogoff's (1998) transformation of participation and Gordon's (2002) transformative pedagogy, Wells argues that the primary goal of participants in education should be a willingness to transform knowledge and activity to create a better society.

Consideration of a spiral of knowing appears to find further parallels in the notion of working theories, particularly given that understandings are "personal, holistic and intuitive" (Wells, 1999, p. 85). As further information or experiences challenge current understandings in a spiral fashion, working theories can be adapted and both knowledge and actions change; later to undergo further change in a similar fashion. Part of this process may involve regression, rather than continual progression in learning. Connections between parallel spirals of knowing may be made by accumulating further working theories and connecting existing working theories through interactions with knowledgeable others that support and co-construct new learning (Claxton, 1990). As children gain more experience and information in a spiral fashion, so the growth and interconnections of working theories continue. Through knowledge building with parents, siblings, peers and/or teachers, children's working theories may also be challenged, creating new understandings and actions.

Sociocultural theory focuses on participation and productive engagement in learning. In relation to the present study, it emphasises theories of children's informal learning; in particular, highlighting children's learning through intent participation in activities not always specifically designed to be educational. Through the concept of a community of inquiry, dialogue in pedagogical relationships with teachers and peers, and working theories and their link with a spiral of knowing, have been suggested as ways that children may build knowledge related to their interest and inquiries. These concepts provide some guidance for a potential framework for a sociocultural curriculum and pedagogy in early childhood education.

Children's interests and inquiries

Literature about children's interests and inquiries that informed the study is now reviewed. Firstly, the contexts for the development of children's interests are identified. Definitions of inquiry are then explored further in order to provide a stronger interpretation of children's interests. This is followed by a review of literature about children's interests-related learning, leading to discussion of a second concept central to the present study, funds of knowledge.

Children's interests: Play-based and emergent

In the early years, children respond spontaneously to, and talk about, things that interest them, attempting to increase their understanding during play and interactions with others. Children's inquiry emerges from everyday experiences and activities in families and communities. Consequently, learning is focused and given meaning by the social and cultural contexts in which it occurs. In other words, as Säljö (1998) highlighted in the quote opening this chapter, children's experiences of the world are pre-interpreted by others. In this way, children gradually understand the adult way of interpreting the world in their families and cultures, and construct their own knowledge, likely to be revealed in their interests-based play.

Emergent curriculum approaches (E. Jones & Nimmo, 1994) encourage teachers to develop curriculum planned in advance that is relevant to the realities and contexts of children's lives. The two most well-known types of emergent curriculum are thematic curriculum and projects. Projects usually focus on a topic over a period of time and some conceptual learning is commonly involved (Helm & Katz, 2001). However, E.

Jones and Nimmo cautioned that "emergent" does not mean that everything emanates from the children. Emergent curriculum arises dynamically not only in response to children's interests, but also to teachers' interests, developmental tasks, things in the physical environment, people in the social environment, serendipity, living together (e.g., conflict resolution, caregiving and routines) and values as a number of possible sources. All these sources are consistent with a sociocultural interpretation of interests. An interpretation of emergent as emerging, that is, spontaneous, is not included in E. Jones and Nimmo's book. However, these terms appear to be used interchangeably in early childhood practice (e.g., see Seitz, 2006).

Patterson and Fleet (2003) argued that the notion of curriculum emerging from children's spontaneous interests can be misinterpreted as teachers waiting for children's interests and inquiries to become obvious. Patterson and Fleet claim that a blend of child-initiated and adult-initiated ideas is the basis of a relevant curriculum; that "children and adults should be seen as co-creators of curriculum" (p. 5). Therefore, as E. Jones and Nimmo (1994) first noted, opportunities for children to develop new interests may result from teachers introducing original and innovative experiences based on their own specialist knowledge and interests.

In the NZ context, this may be interpreted as attending to *Te Whāriki's* imperative to also build curriculum on children's "needs" (p. 28) with the term "needs" defined in the sociocultural sense of culturally-valued knowledge rather than the more commonly applied and developmental sense of special educational needs. Early childhood teachers can encourage children to develop interests through the introduction of experiences, topics and information outside children's experience that contribute to the construction of knowledge, and that also meet the goals and values of the community and society. It is clear then that teachers' professional knowledge and active involvement in teaching processes impact on the opportunities and experiences presented to children, may provide novel learning opportunities for children, and might also influence whose and which interests are followed up.

Moreover, if children's interests are stimulated by the experiences they are involved in, then these sources will undoubtedly spiral back into representation in children's interests themselves. In a professional practice article, an example of a serendipitous

event, also commonly described as a teachable moment (Hyun & Marshall, 2003), is provided by Seitz (2006). Using the example of a child finding a loose metal nut, Seitz described ways in which children's learning was developed into a project through conversations, questions and opportunities and experiences. Seitz's description of emergent curriculum could also be described as children engaging in spirals of knowing that foster increasingly complex working theories.

The term "interests" can, therefore, be seen on two levels in relation to current approaches to early childhood curriculum and pedagogy. Cullen (2003) suggested that children's interests can be interpreted in:

the narrow sense, as in a traditional play-based program where children self-select activities, presumably on the basis of their interests; or in the strong sense, where children's interests are identified by teachers and parents and extended through sustained project work (p. 280).

The long-standing tradition of the play-based programme has meant that teachers have been slow to move from the narrow to the strong interpretation (Anning, Cullen & Fler, 2004).

Towards a stronger interpretation of children's interests

Lindfors (1999) defines an act of inquiry as when "one attempts to elicit another's help in going beyond his or her own present understanding" (p. ix). This definition accords with the concepts described earlier of intersubjectivity in mutual engagement, working theories and engaging with real questions. Lindfors (1999) demonstrates how children argue, challenge, negotiate, compare, evaluate, hypothesise, predict and reflect to deepen their investigation and understandings. More experienced partners in each interaction must listen carefully in various ways in order to pick up on children's inquiries, including being cognisant of their non-verbal behaviour (Wells, 1986). Inquiry acts also seek information, confirmation of an idea, explanation of some phenomenon, and/or wonder about something (Bruner, 1986; Lindfors, 1999; Wells, 1999).

From the sociocultural perspective of holistic, integrated curriculum and reciprocal and responsive pedagogical relationships, curriculum can be viewed as occurring dynamically in response to children's interests stimulated by a range of experiences in

differing contexts. This then suggests that a sociocultural perspective of children's interests might be interpreted in an even stronger sense than Cullen (2003) described, a point returned to shortly.

Studies of children's interests

An extensive, assisted search for literature conducted using Massey University's databases revealed that little published research appears to exist on curriculum and pedagogy built on children's interests, or indeed, children's interests themselves. The only study of direct relevance was Cremin and Slatter (2004) who investigated whether or not young children could be reliably consulted with, using as a focus six 3-5 year-old children's interests, defined as their freely-chosen activities in an early childhood setting. Conscious of validity, a variety of data gathering methods were used: interviews with parents and staff, but not children, (a criticism in terms of their study's aim); three half-day observations of the children, and children taking photographs of favourite places, people and activities. The most popular interests were other children, outside play, socio-dramatic play, art and drawing. Consistent with Cremin and Slatter, the present study defines children's interests as children's spontaneous, self-motivated play, discussions, inquiry and/or investigations that derive from their social and cultural experiences. However, the present study sought to go beyond an interpretation of children's interests as focused on the play environment.

Although children's interests do not appear to have been the primary focus of research, evidence of children's interests is included in studies undertaken in NZ early childhood settings. The following studies used participant observation as a method. Cullen and Allsop (1999) observed three and four-year-old children in spontaneous outdoor play. They noted that children brought a range of prior knowledge and experience to their play, such as how to make concrete, the ability to tie knots, and types of insects and weapons. Such knowledge in young children is likely to result from interest and investigation of their own volition. Similarly, children had a wide range of interests and knowledge in Hedges' (2002a) study. Interests in insects and animals, especially their own pets; their families, particularly caring for babies; and literacy tools and events such as relevant media, birthday cards and shopping lists were among the children's everyday interests that they incorporated into their play.

Brennan (2005, 2007), in her study of the impact of mealtimes as a sociocultural event in an early childhood setting, found that child-initiated conversations occurred about themes such as illness, death and tragedy, highlighting children's interest in aspects of human life outside the centre.

Some light was also shed on the topic of the present study through what is described as children's "informal" learning in the literature. Consistent with the perspective of intent participation, much of this literature has investigated the activities that children undertake enthusiastically in their homes. Children's deep interests and inquiry, based on their experiences in their families and cultures, and their self-motivated desire to explore these further is revealed.

Children's informal learning in families and communities

Children's families provide their first, formative learning experiences and build their sense of identity as a learner through participation in everyday experiences. Knowledge of children can assist teachers to describe, interpret and utilise observations of children as learners. The potential of using a child's interests to focus and extend learning is highlighted in Pollard's (1996) research. Pollard conducted an ethnographic study over three years in England to follow seven children from home and early childhood to primary school experiences. The case study of Hazel demonstrates how different teachers responded to Hazel's interests. In her first year at school, Hazel used personal agency to adapt tasks set by the teacher to connect them with her own interests and previous experience. Pollard notes that this first primary teacher eventually came to appreciate Hazel's talents, but was unable to capitalise on this as a means of motivating Hazel to engage in her schoolwork. The following year, Hazel's next teacher utilised Hazel's interests to channel her learning. Hazel flourished and gained much self-confidence. Her teacher, in working with her interests, fostered her identity as a competent, capable learner.

Tizard and M. Hughes' (1984, 2002) seminal study of children's language in England also drew attention to children's interests in their homes. Researchers observed 30 girls aged three and four years old, as a purposive sample, at their nursery school for one morning and at home during one afternoon, recording 2.5 hours of conversations each time. The study found that everyday experiences at home were valuable learning

opportunities. Through conversations, questions, arguments and stories, the girls and their mothers investigated their world. Children expressed their uncertainties, pursued questions and issues that mattered to them, argued their own viewpoints, and considered the viewpoint of their mothers in supportive and varied contexts. In comparison, such dialogic experiences were rare at the nursery, largely because of teacher-child ratios.

A finding of interest from Tizard and M. Hughes' study in relation to the present study was that the conversations provided insight into the curiosity of four-year-olds. In the context of their families, the children persevered with issues that puzzled them, and pursued questions that interested or confused them. The authors described "passages of intellectual search" (p. 91) where children struggled with several complicated ideas at once. "Because they are such active thinkers, children usually construct their own theories to fill the gaps in their knowledge. These theories surface and can be observed when a misunderstanding is apparent" (p. 95). Here, a link to the idea of working theories may be made, and perhaps several working theories occurring simultaneously within a spiral of knowing as connections are attempted.

A body of recent literature considers further ways in which children's everyday informal learning experiences contribute to their growing interests and understandings. For example, children are immersed in literacy practices in a range of informal home and community settings. Cullen (2002) identified ways in which children construct much literacy knowledge by participating in authentic experiences of interest to them such as meaningful conversations, family stories, shopping experiences or watching television. Here a link between children's everyday experiences and later conceptual knowledge building may be seen.

Many studies of children's informal learning used children's homes as the context for either the study itself or for a comparison with children's centre experiences. Cumming (2003) studied children's experiences and understandings of the origins of food, its preparation for eating and its destiny once eaten by them. She used parent diaries of children's self-initiated food-related conversations and experiences over a three-year period and questionnaires about experiences with animals and plants as data gathering techniques. The most common contexts for conversations about food

were at mealtimes and during food preparation and cooking, highlighting again the importance of first-hand everyday experiences and ways in which everyday concepts could be developed into conceptual learning. Cumming also noted that sometimes a child pursued a topic over a period of time that stretched into months, evidence of a deep interest. Therefore, the necessity to investigate the topic of children's interests over a reasonable period of time to ascertain patterns and themes of repeated interests was indicated.

Dunst, Hamby, Trivette, Raab and Bruder (2000) used survey methods to focus on the learning experiences and opportunities in family and community life of children participating in a range of early intervention programs in the United States. Survey items were identified from a review of the literature on family and community learning in a range of ethnic and cultural contexts. Examples included mealtimes, listening to stories, playing games and socialising experiences such as picnics and visits to zoos. Children's relatives, commonly their mothers, completed the survey. This form of self-reporting is an acknowledged limitation of the study. Another criticism might be the lack of focus on these children's direct experiences of family and cultural events. Nevertheless, the evidence suggested that family and community settings might offer a rich mix of situated everyday learning opportunities for children that may later be represented in self-chosen interests.

Viewing children's early mathematical experiences as a foundation for cognitive development, Tudge and Doucet (2004) employed researchers to observe children for 20 hours over the course of one week. Most observations (60%) occurred in the child's home, about 15% in early childhood centre; another 15% in someone else's home and about 10% in public places such as supermarkets or parks. This highlights the varying contexts of children's informal learning. Data were categorised according to learning and play values, with a focus on literacy and mathematics. Tudge and Doucet noted that explicit mathematical activity was rare, but also that they could not surmise what children might have been thinking or learning while, for example, sitting on a rug decorated with numbers or walking up steps. The importance of involving children in studies of their learning experiences is therefore highlighted alongside the need for a mechanism to recognise informal mathematical learning that occurs as part of the process of building conceptual knowledge.

Similarly, L. Wright's (2004) study using participant observation of children educated in home-based settings in NZ draws attention to the role of everyday experiences in families and communities as authentic learning opportunities. Children were frequently outside the home setting in community settings such as sports grounds, music groups and local schools. Coupled with travel by car or walking, these experiences added richness and variety to children's learning. L. Wright argues that these experiences provide contextually relevant learning that ought to be acknowledged in institutionalised centre-based early childhood settings, rather than the cultural tools of play experiences such as paint, collage, puzzles and the like being considered to constitute the curriculum. Again, such a comment pointed to analysis of children's interests beyond the play-based environment being important to pursue.

Thus far, evidence of informal learning happening in homes has been discussed. Some literature suggested there is disjuncture in children's experiences between the two contexts of home and early childhood centre, possibly due to teachers' lack of awareness of children's home experiences. Flear (1997) studied the experiences of technology in the home for knowledge building in three to five-year-old children. The children's teachers were oblivious to the range and depth of children's understanding of technology. Likewise, Aubrey (1997) investigated the mathematical knowledge five-year-old children had before starting school, also concluding that teachers were unaware of the richness of such prior knowledge. These two studies combined interviews and observations as data gathering techniques. Similarly, Cumming's (2003) study, cited earlier, and Loveridge's (2004) in the NZ context, concluded that children learn much valuable information from family and friends, and that teachers perhaps unwittingly overlook this in their teaching practices.

Failing to capitalise on children's own knowledge and experience gained in informal settings, such as the home, would appear to both negate any espoused sociocultural approach to curriculum and pedagogy and also impact on the quality of diverse children's learning in their centre experiences. In Brooker's (2002) one-year ethnographic study of 16 four-year-olds in English and Bangladeshi families, the rich social and cultural capital of Bangladeshi children's family and community environments had little transfer value because the classroom environment did not

acknowledge this. Although the teachers were not ignorant of the discontinuities between school and home, or differences between families, they believed creating a good play-based learning environment allowed children to follow their interests, and that for children to discover their own motivations and learning style would overcome these inequalities. This invisible pedagogical discourse needed to be learned by children and their families before the children could make progress. While notionally inclusive, teachers' views were founded on exclusive western views of childhood and learning. An alternative interpretation, consistent with Rich and Davis' (2007) findings in relation to bilingual children, is that such children might use their own agency to negotiate between the home and family settings in ways that maintain their identity, but that do not necessarily result in improved learning in the majority culture's system.

Social capital

The notion of social capital, as developed by Coleman (1988), has relevance to the present study. The central tenet of social capital theory is that "relationships matter" (Field, 2003, p. 1). Coleman suggested that family environments contained three types of capital: human capital, for example, the educational levels of parents; physical capital, for example, the material resources and opportunities afforded by family income; and social capital, that is, the social resources in the family and community.

Coleman's theory asserted that human and social capital must combine for children's education to benefit, and suggested that social capital, with positive features such as trust and communication, is instrumental in the development of human capital. For people to cooperate in networks, reciprocity is needed. He suggested family norms and intergenerational relationships promote educational achievement, motivation and engagement that are useful for the cognitive and social development of children. The role of grandparents and other family relations' social capital on children's learning remains sparse in current literature (Donati & Prandini, 2007). Further, Coleman claimed that peers dilute the effect of adult-child relationships on educational outcomes. However, it would be more consistent with the positive perspective of family relationships suggested by the notion of social capital to explore the potential of siblings as sources of learning.

Social capital is a contestable theoretical construct because of its imprecision and lack of rigorous empirical study (Dika & Singh, 2002; Field, 2003). Nevertheless, a growing literature has emerged that largely agrees on the broad impact of social capital upon people's well-being (Dika & Singh, 2002). Further, as a notion, it has positive connotations about the role of families in education, rather than families being viewed as a key source of explanation for inequality in educational outcomes for children (Donati & Prandini, 2007). It also examines family relationships in complex ways rather than as a single entity (Coleman, 1988).

The notion of social capital was used in Australian policy as a key determinant of well-being and subsequent research (Farrell, Tayler, Tennent, & Gahan, 2002; Farrell, Tayler & Tennent, 2004). What distinguishes this research is its use of children aged 4-8 years as informants about their everyday experiences in homes, communities and early childhood settings. In relation to social networks and relationships built on trust, Farrell et al. (2004) found that urban communities had higher levels of social capital than rural communities and recommended strengthening social capital through the use of organised networks rather than relying on the informal nature of most self-chosen relationships. In this way, community capacity building may be achieved (Farrell et al., 2002). Widmer (2007) confirms that family contexts with high densities of connections enhance the amount of social capital available. Therefore, families whose children attend early childhood centres are likely to increase both social connections and access to varied sources of knowledge both consistent with and additional to the families themselves.

Family capital

As a development of social capital theory, the term family capital has been employed recently (Donati & Prandini, 2007; Li, 2007; Marjoribanks, 2005). Marjoribanks considers that family capital has two elements: the social relationships that provide access to resources and the amount and quality of those resources extended to the child through family interactions. Measuring family capital involves investigation of the opportunities, encouragement and support provided by family members in educational activities. Li analysed the family capital of four Chinese families who had immigrated to Canada and whose children (aged from infancy to 16) were involved in second language learning. A mix of participant observation techniques

were employed in the study. His findings support Coleman's (1988) argument in illustrating that it is not so much the type and quality of family capital that influences children's education, but the choices that families made about how this was utilised to support learning. However, the efforts of the teachers to understand the families' values were not part of the study.

Brooker's (2002) study in the early childhood context cited earlier, highlights that teachers need to develop knowledge of children's family capital that may be outside their own experience, and to view the experiences children gain in their homes and families in a positive light. Prince (2006) demonstrates ways in which social capital and funds of knowledge about the environment are shared between teachers and parents in two NZ early childhood education settings, and combine in curriculum construction to strengthen development of young children's conceptual knowledge in communities of learners focused on environmental education in the curriculum. This thesis extends Prince's idea, to employ the term family capital to refer to informal opportunities that are everyday or regular occurrences that combine social, physical and human capital to increase children's learning. Funds of knowledge form a particular kind of family capital.

Funds of knowledge

As an important form of prior, everyday knowledge, the personal qualities of children's knowledge are based on the unique informal family and community experiences that contribute to their foundational knowledge. A credit-based view of the diverse knowledge and experiences found in families is research on children's funds of knowledge (González, Moll & Amanti 2005a; Moll, Amanti, Neff, & González, 1992). Funds of knowledge can then be viewed as a form of family capital that creates informal learning opportunities for children.

Consistent with a sociocultural approach:

The concept of *funds of knowledge* ... is based on a simple premise: People are competent, they have knowledge, and their life experiences have given them that knowledge (González et al., 2005b, pp. ix, italics in original).

Moll et al. (1992) define funds of knowledge as the bodies of knowledge, including information, skills and strategies, which underlie household functioning, development

and well-being. These may include information, ways of thinking and learning, approaches to learning and practical skills (González et al., 1993). Examples include economics, such as budgeting, accounting and loans; repair, such as household appliances, fences and cars; and arts, such as music, painting and sculpture (Moll, 2000). The occupational background of parents is noted as influential by Moll et al. This has been further interpreted recently to include specialist knowledge children learn through their parents' interests as well as occupations (M. Carr, 2001a).

A focus on funds of knowledge provides a framework to recognise how children's knowledge and interests arise in, and are stimulated by, the contexts of their intent participation in everyday activities and experiences. Moreover, their funds of knowledge are supported by the social relationships that are integral to developing knowledge of the world. Moll et al. (1992) believed that if teachers established understanding of local funds of knowledge as a form of professional knowledge, this could inform curriculum through teaching and learning being organised around children's interests and questions, as well as build respect for diverse communities, thereby improving children's educational experiences and outcomes.

In their volume, González et al. (2005a) bring together the theoretical understandings developed of the concept, descriptions of teacher research into funds of knowledge, and how these were utilised in curriculum building. The context of the research was Mexican-American and Latino communities in Tucson, Arizona. González, Floyd-Tenery et al. (1993) and González, Moll et al., (2005) describe the funds of knowledge for teaching methodology used to find out about the job histories and everyday household practices of families. Teachers, as ethnographers, visited the homes of two or three primary school-aged students to gather information about the knowledge families use in their daily lives. They shared this with each other during study groups. Dialogue between the teachers was identified as important to the success of the project in conceptualising the connection between households and schools. Examples of household activities and routines in which children were involved included:

car repair, gardening, home improvement, child-care, or working in a family business or hobby. ... [W]e asked about music practices, sports, shopping with coupons, and

other aspects of a child's life, which helped us develop a competent and multidimensional image of the range of possible funds of knowledge (p. 18).

Of further significance to the present study, González, Moll et al. (2005) claim that the teachers who participated in their study were attracted to developing an inquiry model of teaching, in order for students to draw on and be actively involved in developing their knowledge. In addition, teachers came to deeper understandings of the complexities of their students' lives. González et al. suggest that funds of knowledge are a mediational artefact in supporting teacher understanding of the dynamic nature of children's lives within their families and communities.

Riojas-Cortez (2001) extended the term to include cultural traits such as parents' language, values and beliefs, ways of discipline, and the value of education as funds of knowledge sources. In her study of the socio-dramatic play of 12 4-5 year olds in a bilingual programme, she sought to illustrate ways that culturally inclusive curriculum could go beyond tokenism. Through observations and interviews with the teacher and the children's parents, she identified ways in which a teacher could ascertain information from children and families to create more authentic and meaningful curriculum. Similar to González et al. (2005a), her perspective is that funds of knowledge indicate children's capabilities, can inform curriculum and can assist children to later develop formal bodies of knowledge and skills such as language and literacy.

Moll (2005) makes an important proviso to the concept of funds of knowledge that is relevant to the present study. He notes that the concept is dynamic, as it changes with each relationship in each family and evolves to new circumstances and cultures. Parallels with the dynamic notions discussed earlier of working theories, a spiral of knowing, ZPD and learning as transformation through participation become evident.

The potential of funds of knowledge to build sociocultural curriculum and pedagogy

Hensley (2005) was one of the teachers involved in the Mexican-American and Latino communities' funds of knowledge project in Tucson, Arizona. During a home visit he asked about a guitar he noticed and found out that father played guitar and keyboard

and wrote songs and poetry. He then asked the father to write some children's songs and create a musical that tied in knowledge of music and of gardening. Another parent visited had a background in dance and was asked to help choreograph the musical. Costume making workshops were organised that several other parents participated in. The musical was performed by children five times.

In the UK and Australia, Comber and Kamler (2005) align funds of knowledge with Thomson's (2002) notion of the "virtual school bag" (p. 1) as both concepts enable teachers to see students as knowledgeable and resourceful. Thomson provides two hypothetical cases of children about to start school, detailing their "virtual school bag full of things they have already learned at home, with their friends, and in and from the world in which they live" (p. 1). Despite each child's school bag containing approximately equal, if different, knowledge and interests, Thomson shows how the culture of the school determines whether or not the child gets to open the bag and make use of its contents. Parallels with Brooker's (2002) findings regarding family capital are evident. Again, for early childhood education, this raised the question of whose interests are noticed in building curriculum. Thomson's suggestion that much of what students already know is not capitalised on has implications for all sectors of education, including early childhood education.

Recent studies as part of the Home-School Knowledge Exchange project in the UK (see M. Hughes & Pollard, 2006) drew on the concept of funds of knowledge. Large, interdisciplinary research teams investigated ways to improve home-school collaboration. A specific aim was to value the knowledge and practice of the homes, although home visits were not used as a methodology. Instead, knowledge exchange activities included making a video of children's literacy learning including ideas about how parents might support the children's reading and writing; children filling a shoe box with items such as photos, toys, books and other special items from home to bring to school for use in literacy sessions; and a bag in which to bring a favourite toy to school in order to promote relationships and dialogue between teachers and children (M. Hughes & Greenhough, 2006). Other examples were providing a disposable camera for children to use at home during holidays and choose photographs to share with their class (Feiler, Greenhough, Winter, Salway & Scanlan, 2006). The potential

of a funds of knowledge framework was useful to alter teachers' perceptions of families and position parents more positively in children's education.

Within early childhood settings, funds of knowledge may be an important way in which children's interests can be recognised, engaged with and extended.

... what is important is not only that the children are exposed to multiple domains in which funds of knowledge are used, but that they are also afforded the opportunity to experiment with them in each domain. ... they may emulate adults by creating play situations for practicing the learned behaviour (Vélez-Ibáñez & Greenberg, 2005, p. 61).

The potential of teachers building curriculum on children's knowledge, experiences and interests in an authentic and empowering way is highlighted through teachers' use of a funds of knowledge approach. However, a criticism of González et al.'s (2005a) collection is that the voices and experiences of children and families are not heard directly, but reported through teacher interpretation. Incorporating their perspectives would perhaps strengthen the validity of the discussion and the notion, and highlight the pedagogical relationships in which funds of knowledge are developed. Further, a step was not made between this intuitive type of knowledge and conceptual knowledge that may result to provide a link between participatory learning and knowledge outcomes. In this way, a link might be made between Vygotsky's (1986) notions described earlier of everyday and scientific concepts; Hedegaard and Chaiklin's (2005) notion of "radical-local" teaching and learning, where both general societal interests and individual personal development and learning contribute to the content of educational programmes; and ways that early childhood settings provide experiences for children to draw on to develop more formal knowledge in later schooling.

Linking funds of knowledge with children's interests and inquiries

Each study cited in the sections on children's informal learning and interests-based learning provides evidence for the view that children's interests are often driven by their awareness of the world and a desire to act with knowledge and competence within this world (Brennan, 2005; E. Wood, 2004). As they develop competence, children are gaining funds of knowledge on a variety of matters that also inform

working theories and actions when confronted with seemingly similar situations and experiences. As Tudge and Doucet's (2004) study found in relation to mathematics, informal learning is often intuitive and difficult to articulate and requires a different framework for explaining it. A funds of knowledge perspective may explain this.

We found family members engaged in diverse occupations that gave them skills in many areas. For example, carpenters and seamstresses both engage in mathematical practices, which are often intuitive, based on a common sense, and not based on academics (González et al., 2005, p. 13).

More literature about children's learning is now interpreted from a funds of knowledge perspective to strengthen the argument that these are fundamental to explaining children's interests and explaining both everyday and early conceptual learning.

In Pollard's (1996) study, the contributions Hazel's parents made to her interests through their own backgrounds (her mother had talent and interests in art and her father was a designer with an engineering company) were influential funds of knowledge in the development of Hazel's interests and learning. In her drawing she was able to reproduce what she had seen, even if only briefly. For example, aspects of Inca/Aztec architecture her father was looking at one night were reproduced in serpents' teeth she drew. Similarly, Katie, a two-year-old, (Hedges, 2004a), had many experiences of music and literacy provided by her parents. It was therefore unsurprising that language, literacy and music played important roles in Katie's expression of new understandings in another knowledge domain. The knowledge that children in Cullen and Allsop's (1999) study of outdoor play and Cumming's (2003) study of children's experiences and understandings of food can also be interpreted as funds of knowledge gained in a range of activities and contexts that, in turn, influenced their interests. A framework for identifying the pedagogical relationships and contexts of children's interests and inquiries through informal learning is offered by the notion of funds of knowledge.

Furthermore, awareness of children's funds of knowledge as a form of family capital may lead to consideration of opportunities for learning in community settings. Again, the examples of Hazel (Pollard, 1996) and Katie (Hedges, 2004a) demonstrate this. Hazel's parents took her on frequent trips to the museum and zoos to feed her growing

interest in natural history. Katie had access to her sisters' dancing and music classes that contributed further to her knowledge and experience.

Of these studies, many used qualitative methodologies and drew on ethnographic methods to ensure that children's experiences were researched over a period of time. This assists analysis of patterns and themes in activities and relationships. A major criticism of several of these studies is that children were rarely directly involved as participants.

Children's perspectives bring different insights and add to a study's validity and authenticity as Maddock's (2006) and Rich and Davis' (2007) studies illustrate. Maddock undertook ethnographic case studies over 18 months of nine 8-10 year old children identified as "difficult" by their schools. She observed and talked with the children about their home activities, among several data generation techniques that also involved teachers and parents. Maddock found three different personas in her data: firstly, the child as known by the teacher; and secondly, the child as known by the parent. The third persona was the child acting with agency to develop her/his own understandings, often by manipulating or subverting teacher or parent-led experiences. The children themselves transformed learning outcomes so that experiences provided by their families were personally meaningful. Such a conclusion is supported by Rich and Davis' finding that children use their own agency to negotiate between the home and family settings in ways that maintain their identity.

Linking funds of knowledge with teachers' professional knowledge

Moll et al. (1992) proposed that teachers build on knowledge and practice occurring in children's homes. Through understanding each child's prior knowledge and interests, and the child's home background and funds of knowledge, teachers and children could extend children's knowledge in a meaningful way. The concept of funds of knowledge provides a positive and credit-based way for teachers to acknowledge the richness of children's lives and interests, collaborate with parents in children's learning and reduce the disjuncture between homes and centres cited earlier (Aubrey, 1997; Cumming, 2003; Flear, 1997; Loveridge, 2004). If early childhood education settings are to be viewed as communities for learning and be focused on positive outcomes for children's learning, parents and families must be involved.

Varying interpretations of children's interests have been exemplified and discussed. Children's interests do not emerge in a vacuum, but as the literature on children's informal learning in their families and communities highlights, are likely stimulated by children's intent participation in everyday experiences in their families, cultures and communities. Consideration of experiences children may be exposed to through their families and teachers' interests supported that a third dimension of children's interests in the present study, besides play-based and project-based, might be revealed, that has implications for teacher knowledge. A shift from project to inquiry-based learning was an important outcome of New Beginnings Preschool's action research that investigated ways project work could build a community of learners (J. Wright, Ryder & Mayo, 2006). A third dimension might be revealed by looking for patterns in children's inquiries and identifying funds of knowledge-based interests and inquiries.

Curriculum and societal goals: Culturally-valued knowledge

Early educational experiences of children are culturally situated and reflect the varying values and beliefs of the culture (New, 1999). New notes the importance of parents, teachers and community members negotiating educational expectations of children from this perspective. *Te Whāriki's* emphasis on Māori knowledge and educational philosophy and promotion of biculturalism provides one example. New also states that a curriculum should emphasise the relationship between goals for children and societal expectations for adults, something consistent with *Te Whāriki's* overall goal for children:

to grow up as competent and confident learners and communicators, healthy in mind, body, and spirit, secure in their sense of belonging and in the knowledge that they make a valued contribution to society (p. 9).

Culturally-valued knowledge is commonly defined within knowledge domains. Bowman, Donovan and Burns (2001) suggested much research has occurred in the domains of literacy, numeracy and science because these are the domains in which children have a "natural proclivity to learn, experiment, and explore" (p. 9). However, it could also be argued that the domains of literacy and numeracy are privileged because they act as funds of knowledge that support the construction of knowledge in other domains. A recent focus on evidence-based policy in NZ (e.g.,

Alton-Lee, 2003; S.-E. Farquhar, 2003) has led to a proliferation of research on literacy and numeracy, including in early childhood education. While this educational and political discourse continues, these domains will continue to be privileged. Consequently, this may be reflected in the emphases that teachers select for curriculum planning or ways that children's interests are extended, and in the goals that parents express for their children. This serves to reinforce and validate the status of these domains.

The risks of highlighting particular domains are that a focus on holistic education may be lost or that inappropriate teaching emphasis occurs. Some teachers may understand that concepts such as those of literacy and numeracy can be taught through children's interests, while others may struggle with the level of professional knowledge required to do so. Cullen (2003) suggested that the way *Te Whāriki's* woven mat metaphor allows for conceptual knowledge to be incorporated in interests-based learning needs to be made more explicit to teachers. Teachers need to find ways to identify the themes of children's interests and curiosity in their families and communities, in order to build a meaningful curriculum that also develops, at least in an early way, culturally-valued and conceptual knowledge.

Summary

In this chapter, several bodies of literature have been reviewed and key ideas related to children's interests and inquiry have been introduced. This summary highlights key areas of the review related to gaps in current research, theoretical issues and methodology.

The studies reviewed supported that children are likely to have serious and deep interests in topics of their own choice, contributed to from a variety of sources and experiences of social and cultural significance. Children may express and extend their funds of knowledge, working theories and early conceptual knowledge in these topics to pursue this interest over a period of time. Furthermore, children engaged in meaningful intellectual inquiry, often with parents, to construct further knowledge and shared understandings of these topics and events. This literature suggested that children may be more likely to learn when they are engaged with others in interesting, relevant activities in which they enjoy developing knowledge, have a degree of

intrinsic motivation in learning and a vested interest in continuing their knowledge and inquiry. Furthermore, they highlighted the role adults play in providing a range of contexts and experiences for children's learning and whether or not children's interests and learning might be identified, explored or extended. The role of other children such as peers or siblings was however overlooked in the available literature.

Of most significance in relation to the present study, no studies of children's learning had children's interests as the primary focus. However, some studies provided insight into the range and depth of children's interests and inquiries, and indicated that qualitative approaches, incorporating ethnographic techniques, might illuminate these further. Further, the dominance of play in early childhood education may have discouraged teachers from deeper interpretations of children's interests or a sociocultural perspective of the term "interests" (Cullen, 2003). Sociocultural theory may provide a way to highlight learning-and-teaching that may currently be under-emphasised. Certainly, a stronger interpretation of children's interests responsive to sociocultural theory suggested these might involve funds of knowledge-based inquiry about being members of families and cultures. A funds of knowledge perspective of children's interests has been highlighted as a way to connect teachers, children and their families meaningfully.

In addition, no previous research could be located that specifically investigated the ways in which teachers recognise and engage with children's interests as a focus of learning and teaching. Therefore, it was established that there was a major gap in the research available: research that focused on children's interests and inquiries, explored the mechanisms by which teachers recognise what these are, and choose which will be used in curriculum. This appears particularly crucial in NZ when it is specified in *Te Whāriki* that children's interests are a major source of generating curriculum.

A further body of literature reviewed was that related to the nature of knowledge and theories of informal learning. A sociocultural perspective of children's learning suggests that notions of learning through intent participation and inquiry, that takes into account their family and community funds of knowledge experiences, is vital to understanding how children build everyday knowledge and working theories that lead to conceptual knowledge. Both the participation and knowledge creation metaphors

of learning (Paavola et al., 2004) appear to have relevance to children's interests-related knowledge building as much learning is co-constructed with adults and peers in pedagogical relationships. Further, the knowledge creation metaphor is linked to inquiry learning. Major notions of a community of inquiry that seem to have relevance are dialogue and a spiral of knowing; the latter assisting understanding of the concept of working theories.

In short, interests-based curriculum and pedagogy is highly participative, informal, interpretive and often spontaneous. Inquiry learning and knowledge building for children is incremental, and is most effective when it builds on prior knowledge and experience and engages with working theories as part of a spiral of knowing. In this chapter two possible frameworks for conceptualising a sociocultural approach to interests-based curriculum and pedagogy in early childhood education were identified: funds of knowledge and key concepts of a community of inquiry.

Chapter three

TEACHER KNOWLEDGE AND INQUIRY

We all acquire folk theories and are apt to go on using them until we get far enough into some endeavour that we need specialised knowledge (Bereiter, 2002, p. 9).

Introduction

Given that young children are capable of learning quickly and enthusiastically, the extent of that learning is highly dependent on the knowledge and skills of adults with whom they interact. This chapter discusses teacher knowledge and inquiry. The professional knowledge and experiences teachers might draw on in their curriculum and pedagogical decision-making are described. This is followed by consideration of evidence-based approaches to educational decision-making, incorporating consideration of teacher inquiry, and what constitutes effective professional learning.

At the conclusion of the chapter, drawing on chapters two and three, gaps in the research, theoretical and methodological literature available to inform curriculum, pedagogy, teacher knowledge and professional learning are further explicated, along with direction with regard to methodology. These are subsequently drawn together to provide the research focus and questions of the present study.

Teacher knowledge

Early childhood pedagogy is complex and requires expertise. A growing body of international literature describes effective pedagogy in the early years (e.g., see Bowman et al., 2001; S.-E. Farquhar, 2003; Siraj-Blatchford & Sylva, 2004; Siraj-Blatchford, Sylva, Muttock, Gilden & Bell, 2002). S.-E. Farquhar's (2003) NZ synthesis of research identified seven characteristics of effective pedagogy that maximise children's learning outcomes. Many of these characteristics are responsive to the broad definition of play as pedagogy, encompassing the way teachers make provision for play-based learning experiences, the design of play and learning environments, and the pedagogical techniques and strategies used to support and enhance learning through play (E. Wood, 2004). These characteristics also incorporate a sociocultural perspective in terms of the role of families and

communities in children's learning and teachers' ability to understand and build on that learning in the early childhood setting.

Siraj-Blatchford et al. (2002) argued that effective pedagogy has three features: adult and child involvement in high quality dialogue, including episodes of sustained thinking between both adults and children and child peers; cognitive engagement or co-construction of learning in a careful juxtaposition of teacher initiated and child initiated experiences; and the use of pedagogical techniques such as modelling, demonstrating, questioning and explaining. This study of effective pedagogy also provides explicit guidance on essential elements of teachers' professional knowledge: teachers need to be knowledgeable about assessment of children's learning, followed by planning of a wide range of learning experiences; child development and curriculum; and shared educational aims with parents supported by effective communication. Siraj-Blatchford et al.'s three features highlight the importance of teachers being able to converse with children for a period of time in ways that draw out children's understandings.

Categories and models of professional knowledge

Research to generate models of teacher knowledge has occurred over the past thirty years in the primary and secondary sectors, but no comprehensive study of early childhood teachers' knowledge has been undertaken. Nevertheless, seminal studies can be drawn on for consideration of the categories that may be relevant to a curriculum built on children's interests and that are responsive to the literature on effective pedagogy.

W. Carr and Kemmis (1986) delineated seven categories of teacher knowledge. These are: professional knowledge of pedagogy and curriculum; educational theory; contextual knowledge of individual students, the class, community and culture; knowledge of effective teaching strategies; social and moral theories and philosophies; common-sense knowledge and the folk wisdom of teachers. Similarly, Shulman (1986), and Wilson, Shulman and Richert (1987), defined seven categories of teacher knowledge: knowledge of content, pedagogy, curriculum, learners and learning, contexts of schooling, pedagogical content knowledge, and educational philosophies, goals and objectives.

These models resonate well with the literature on children's interests cited earlier. Considering this body of literature, it seems pertinent that early childhood teachers require deep theoretical knowledge of learning, knowledge of curriculum and pedagogy applicable to young children, insightful knowledge about individual children, their families, and the communities and cultures of the educational context, knowledge of appropriate pedagogical strategies, understanding of early childhood philosophy and a range of general knowledge and experience to draw on. In considering this general knowledge and experience, it is likely then that a range of informal knowledge may also be drawn on intuitively in teacher decision making and action. Of these models, only W. Carr and Kemmis (1986) include informal knowledge as part of teachers' professional knowledge, by incorporating categories named teachers' common-sense knowledge and folk wisdom. It is possible that the funds of knowledge they have been exposed to during their lives may be part of this aspect of professional knowledge and also involve their own implicit or working theories.

Bereiter (2002) argues that folk theories are:

theories or conceptual frameworks people pick up from popular culture and use in their daily efforts to make sense of events and plan their actions. We ... are apt to go on using them until we get far enough into some endeavour that we need specialised knowledge (p. 9).

It should be noted that folk, implicit, intuitive or working theories in adults differ qualitatively from those in children due to adults' wider experience and knowledge (Inagaki & Hatano, 2002). Bereiter (2002) suggests that researchers make use of teachers' implicit knowledge and use theory and research to assist teachers to address practice. For Bereiter, this facilitates a process of continual reflection and improvement.

Early childhood teachers' professional knowledge

An explosion of research since the 1990s has led to increased understandings of teaching and learning in the early years. It is now widely accepted that teachers need specialised knowledge of early childhood education in order to teach young children (Bowman et al., 2001; Cullen, 2003; Howes, 1997). The NZ early childhood teacher education community values diversity in its provision, and therefore a variety of

professional knowledge (Kane, 2005). Current policy in NZ is to increase the number of qualified teachers. For many in a teaching role, this involves complementing informal and practical knowledge with evidence-based knowledge.

Viewing a curriculum as a guide for practice, as is the case with *Te Whāriki*, rather than a detailed description of content to be covered, will only be effective if teachers have an extensive professional knowledge base to bring to their decision-making. Findings from an action research project in the UK (Anning & A. Edwards, 1999) support the notion that teachers who are confident about their professional knowledge are more likely to recognise and maximise potential learning in children's play experiences. Moreover, ways teachers continue to examine their practice through reflection, inquiry and consideration of theory and research, may also be critical to responding to children's changing interests in a curriculum continually negotiated in response to evolving priorities.

Teachers' funds of knowledge

Teachers, like children, are learners who bring a diverse range of formal and informal knowledge and experience to curriculum and pedagogy. Similarly, teachers are shaped by the contexts of their personal and professional experiences. Recent writers have made use of the term funds of knowledge in relation to teacher knowledge. Gupta (2006) uses the term to describe teacher beliefs and their origins, particularly in childhood experiences, and considers ways to make this knowledge explicit so student teachers make connections between informal and formal knowledge. Andrews, Yee, Greenhough, M. Hughes and Winter (2005) use the term to explain aspects of teachers' personal and professional knowledge, specifically in relation to mathematics teaching. They show how experiences of being a parent, being a teacher, sharing ethnic and religious background, and being a part of the local community influence teacher knowledge.

Teachers' theories of practice may be considered funds of knowledge that impact on the curriculum constructed with children. These theories link to learning environments provided and the curriculum and pedagogical practices teachers engage in, but may not necessarily be clearly articulated nor have a foundation of theoretical knowledge (for a NZ example, see Bell, 1990). Theories of practice could also be

referred to as working theories teachers have developed through their practical experiences, with or without reference to formal knowledge (Claxton, 1990). As teachers gain further experience and knowledge, they review their theories. Moreover, if personal experience shapes teachers so strongly, then formal theory must have clear relevance to their experiences or it may not be considered in reviews of theories of practice. Alternatively, it may become transformed to become judged appropriate for the context (Schoonmaker & Ryan, 1996).

Teachers' personal and professional knowledge and experience in NZ is likely to have been influenced by the views of play as pedagogy and developmental theories of childhood (Anning, Cullen & Fler, 2004; Cannella, 1997). These theories may have been added to by exposure to sociocultural views of learning. As noted earlier, a mix of theories in *Te Whāriki* may create tension (Cullen, 1996, 2003). In that case, teachers may resort to their own implicit theories about children's interests and inquiries, not always considering how sociocultural theoretical ideas may inform these, and build their practice from observation and participation with colleagues.

Furthermore, examining constraints to applying teachers' professional knowledge may be important. For example, from a sociocultural perspective, the reality of children's ability to follow their interests is dependent upon the structure of the learning environment, routines that punctuate learning opportunities, the amount of interaction with peers and adults, provision of resources and the potential for children's interests and inquiries to be connected with worthwhile learning (Bennett et al., 1997; Brooker, 2002; Cannella & Viruru, 1997; M. Hughes & Tizard, 1984, 2002).

Influences on teachers' professional learning

A growing appreciation of education as a dynamic field means that initial specialised professional knowledge, often gained in teacher education, is limited (e.g., see Wideen, Smith & Mayer-Moon, 1998). Continued professional learning is expected of teachers as evidence about teaching and learning increases and changes (Guskey, 2000). For example, teachers are expected to alter their practices to align with new theories, such as sociocultural theories (Butler, Lauscher, Jarvis-Selinger, & Beckingham, 2004). Often there may be a tension between constructing new knowledge and deepening existing knowledge, with both needing to be respected

(Grossman et al., 2001). Influences on teacher learning are a ripe topic for current research (Beijaard, Korthagen & Verloop, 2007).

There is much in the academic literature about teacher development (e.g., Campbell, 2002; Day 1999; Goodson & Sikes, 2001). This literature suggests several features of teachers' professional learning that are consistent with sociocultural perspectives. Firstly, studies suggest that teacher development is ongoing in response to changes in knowledge and understanding; and secondly, that it is highly context-dependent and influenced by the culture of the organisation worked for. Thirdly, it proffers that teachers' personal and professional development is impacted on by political, historical, social and economic events and change; and fourthly, that teachers' personal beliefs impact on both their teaching and their professional learning experiences.

Reflective practice has an established history in teacher education and teaching practice (Dana & Yendol-Silva, 2003; Schön, 1983, 1987). The deeply-held implicit, personal or working theories that teachers hold are a vital aspect for teacher inquiry and reflection. Recent perspectives on reflection suggest that questioning taken-for-granted assumptions and exploring reified beliefs and practices can contribute to changes in practice (Raths, 2001). Yet, if it were that uncomplicated for teachers to improve practice, they would do so. Instead, teachers are often resistant to change to established practices (Guskey, 2000, 2002). Reflective practice represents a powerful tool for professional growth but may remain at a superficial level unless teachers are empowered to reflect on practice (Lindsay & Mason, 2000), and engage in theoretically-informed dialogue.

Guskey's (2002) model of teacher development and change, originally developed in 1986, proposes a different idea to many traditional models that suggest teacher development is a relatively straightforward process of induction and maturity in a profession (e.g., Katz, 1995). Such models promote a technicist view of teachers and an uncomplicated set of knowledge, skills and dispositions. The reality of teaching is much more complex and interpretive (Dall'Alba & Sandberg, 2006). Guskey (2002) notes that change may be a difficult and incremental process for teachers, that regular feedback on progress is beneficial, and that continued "follow-up, support and

pressure" (p. 388) is necessary to effect change. Significantly, he suggests teachers require evidence of any necessity to change practices, often through trialling successful new practices themselves, before changes in their beliefs occur.

When research and inquiry is in keeping with teachers' interests, significant and sophisticated new understandings, insights and ideas emerge about teaching practice and changes are made. This inquiry benefits from a critical friend knowledgeable about research (Goodfellow & Hedges, 2007). The research undertaken in NZ Centres of Innovation (see <http://www.minedu.govt.nz/index.cfm?layout=index&indexid=8303>) recently, demonstrates the value of teacher inquiry on outcomes for children (e.g., see Haworth, Cullen, Simmons, Schimanski, McGarva, & Woodhead, 2006; J. Wright et al., 2006). It is likely that key success factors of these research projects have been the government funding that has enabled teacher time release and the support of experienced research associates in the research processes and dissemination phases. Researchers have assisted teachers to engage in inquiry and achieve significant personal and professional change (see Meade, 2006).

Therefore, teachers do not engage in change simply because an outside facilitator suggests it, although that external perspective may raise issues that teachers do not recognise themselves. Teacher change needs to recognise teachers as learners who can be empowered through iterative spirals of engagement in co-constructed professional learning (Fleet & Patterson, 2001; Meade, 2006; Timperley et al., 2007).

In summary, teaching can be viewed as an active, complex and contextualised process in which teachers' formal and informal professional knowledge provides a means for interpreting and responding to teaching and learning interactions. The notion of funds of knowledge has potential to examine the kinds of informal knowledge teachers might draw on to assess and respond meaningfully to children's interests and inquiry. Teachers' professional knowledge undergoes change, development and refinement throughout their careers in varying ways. Ways in which this might be supported to go beyond reflection and have a strongly articulated theoretical basis warrant attention.

Evidence-based approaches to teaching

In recent years, policy making and practice in education have been increasingly linked to research evidence and positive outcomes for children (Aubrey, Anning, Calder & David, 2003; S.-E. Farquhar, 2003; Mitchell & Cubey, 2003). Certainly, many writers advocate a closer link between research, practice and policy. Yet, an evidence-based approach may be inappropriate for education because it assumes a linear relationship between research and practice (Hodkinson & Smith, 2004) borrowed from scientific research and the health professions. Moreover, McIntyre (2005) suggests that the commonly acknowledged gap between research and practice is because they are two contrasting kinds of knowledge with differing agendas. For example, research-based propositions must be abstract and theoretical to be judged of value, whereas teachers commonly want research knowledge to have pragmatic value and address their context-specific situations.

Linking research with teaching

Two NZ best evidence syntheses note that although there is much literature on teacher professional development, very little of this research investigates outcomes for learners (Mitchell & Cubey, 2003; Timperley et al., 2007). The notion of "outcomes" warrants further attention at this point. A focus on making connections between professional knowledge and improvements in student outcomes is relatively recent and not straightforward (Guskey, 2000). The relationship between professional learning and student learning is complex, dynamic, and affected by variety of factors. These diverse factors foil efforts to ascertain a direct, causal link between teachers' professional learning and student learning improvements. In the early childhood context, this could point to employing a sociocultural approach in defining and assessing outcomes, as used by M. Carr (2001a) or Maddock (2006). In this way, emphasis on the processes of learning and knowledge building might be more illuminating about children's learning than an emphasis on what was actually learned and how this might be measured. Furthermore, if the goals of education are to produce lifelong learners and responsible citizens, as intimated in *Te Whāriki*, then education is a long-term activity, not easily measurable in short-term outcomes.

Not only are outcomes for children not easily measurable or observable in much early childhood research, as a longitudinal design would be most desirable, there are a

broad range of possible outcomes. Those mentioned in chapter two include dispositions for learning, positive social and emotional behaviours, cognitive change and language development, health and well-being and behavioural changes. Penn and Lloyd (2006) add to this list long-term social and emotional outcomes, improved parenting skills and parents' changed relationships with children. Clearly, what is desirable and what counts as an outcome is a matter of judgement (Hammersley, 2005). In this way, research can potentially be used to justify a number of decisions in policy or practice.

Research related to outcomes for diverse learners is currently a focus in NZ best evidence syntheses and subsequent policy development (e.g., Alton-Lee, 2003; S.-E. Farquhar, 2003; Mitchell & Cubey, 2003). Three problems arise with this focus. The first is that research often reveals that differences in achievement relate to culture rather than ability, but research can rarely advise teachers how to rectify this (Alton-Lee, 2006). The second is that early childhood education has a relatively limited research base (e.g., see S.-E. Farquhar, 2003; Penn & Lloyd, 2007). Thirdly, given this, a link between policy and funded research may have resulted in domains, and/or researchers, being privileged (Cullen, 2007a) or findings interpreted to justify policy (Croad & S.-E. Farquhar, 2005).

The nature, quality, veracity, interpretation and use of evidence can therefore be a source of debate. Queries have been raised about these issues in relation to research included in best evidence syntheses and systematic reviews, and whether or not particular research has been privileged (MacLure, 2005; Penn & Lloyd, 2006, 2007; Sebba, 2004; Thomas, 2004). Rigorous approaches to best evidence syntheses, where only research that has undertaken some process of peer review is included, are examples of attempts to make a direct link between research and practice (Aubrey et al., 2003; S.-E. Farquhar, 2003). Other syntheses incorporate material that has not undergone scrutiny by the academic community (see Mitchell & Cubey, 2003) and therefore, while it may be of practical value, may not encourage teachers to consider research critically (Meade, 2000). Nevertheless, such studies may contain "nuggets" of wisdom relevant to teachers (Pawson, 2006) that may otherwise be overlooked.

If research were defined too narrowly, the evidence base for a teaching profession facing the challenges of a rapidly changing world is then limited (Thomas, 2004; Whitty, 2006). Further, Hammersley (2005) claims policy and practice cannot be based directly on research because research needs to be filtered through teachers' experiences and understandings. Hence, the difference between evidence-based and evidence-informed practice is raised (Hammersley, 2004; Thomas, 2004). While the latter is generally regarded as less robust, it allows for a range of evidence to be considered, including evidence that comes from inquiring into practice (Thomas, 2004).

If research-based knowledge is to influence practice, it needs to become one of the regular sources contributing to informed professional action and become embedded in teachers' professional knowledge. To enhance practice, research needs to inform both the interpretations and responses of teachers, and be sensitive to the existing values and expertise teachers bring to their professional decision-making (A. Edwards, 2000; Hammersley, 2004). Hence, the boundaries between research, practice and professional knowledge and learning are likely to be complex, blurred and have considerable overlap, particularly when teachers' informal knowledge is taken into account.

Davies (1999) noted that evidence-based practice in education functions at two levels: firstly, using research literature as a basis for practice; and secondly, establishing sound evidence by the systematic collection of information. Davies' second level of interpretation suggests that rather than a role of implementing the findings of academic research, teachers might be positioned more actively in research. Evidence can be used for two purposes: to support a case for particular practices and/or to understand a particular phenomenon (Groundwater-Smith & Dadds, 2004). Sykes (1999) noted that teachers' participation in producing new knowledge is a fundamental aspect of research-based teacher development. Teachers' engagement in shared inquiry may be a successful model for teacher development and a way to strengthen the position of research in the evidence that informs teachers' decision-making. Such an approach is also consistent with Guskey's model of teacher change. These ideas informed the methodology of the present study.

Teachers' professional learning

Ongoing knowledge building through professional learning is essential as educational theory and research progress and the challenges of teaching constantly change (Guskey, 2000; Timperley et al., 2007). Research on teacher effectiveness has shown that working with teacher beliefs, helping teachers link theory, research, philosophy and practice, and providing opportunities to engage in discussion about new research findings is integral to ongoing success and efficacy (e.g., Kennedy, 1997; Raths, 2001; Wideen et al., 1998).

Although facilitators may have incorporated these aspects into actual programmes, government-funded teacher professional development in NZ has not focused on such teacher knowledge building or efficacy. Instead, recently, it emphasised the implementation of *Te Whāriki* and associated assessment and evaluation material, transitions for children, the development of management systems and accountabilities and concerns and considerations of quality (Gaffney, 2003; Hampton, 2000). One of Mepham's (2000) participants in her narrative study of NZ early childhood teachers' professional development considered funded professional development came from a deficit view of teachers, that is, professional development filled gaps in knowledge or practice, a common criticism of programmes across sectors (e.g., see Timperley et al., 2007). This may also be because not all those in an educative role in early childhood yet hold a teaching qualification.

Fleet and Patterson (2001) described a successful programme in Sydney that occurred over an 18 month time frame, where the authors as researchers/professional developers engaged in co-constructed dialogue about planning processes, using documentation as a source of evidence of practice. The authors both valued and affirmed teachers' practical knowledge, while also offering expertise and alternative interpretations and challenges for teachers to consider in their practices. Opportunities to revisit ideas over time, and changes that occurred for most participants, upheld the complexity of teaching and spirals of engagement in learning as a professional growth process.

Fleet and Patterson's approach supports Timperley et al.'s change in nomenclature from professional development to professional learning, as indicative of

acknowledging the nature of the intrapersonal and interpersonal processes necessary to effect lasting change. Along with a move away from a maturational, incremental and experiential approach to teacher development, the present study also prefers the term "teachers' professional learning" to describe activities of value to teachers in inquiring into and improving their practice. For example, the NZ Centres of Innovation research projects (see Haworth et al., 2006; Meade, 2006; J. Wright et al., 2006) represent a credit-based view of teachers as professional learners. Engagement in supported inquiry has empowered teachers in personal and professional change.

There appear to be few well-designed and sustained programmes of professional learning for early childhood teachers in NZ. The Educational Leadership Project, which has largely worked with teachers on sociocultural approaches to assessment and planning in early childhood settings, is a notable exception (see M. Carr, Hatherly, Lee & Ramsey, 2003; Hatherly & Lee, 2003). One goal of such programmes is to build capacity and capability in pedagogical leaders (Anning & A. Edwards, 1999). Participation in sustained professional learning may develop future educational leaders to fill a "void in the area of curriculum and pedagogical leadership" (McLeod, 2002, p. 319) in NZ.

Yet, there is abundant literature on teacher development, including in early childhood education (e.g., Connelly & Clandinin, 1999; Goodson & Sikes, 2001; Jalongo & Isenberg, 1995; MacNaughton, 2003; Mepham, 2000). Nevertheless, few studies appear to have considered the role that theory, research and inquiry may play directly in teachers' professional learning. These studies are now reviewed.

Involving teachers in inquiry

Jordan (2003) conducted case studies of four centres who had self-selected into a professional development programme. Jordan facilitated the programme about teachers' co-construction of understanding about children's thinking and inquiry. The research questions and propositions developed during the study as the teachers inquired into their own practices. The methodology adopted was that of facilitated action research over differing time periods in each centre. Collaborative action research was equated by Jordan with co-constructing understandings, both between teachers and children, and between teachers engaged in a centre-based professional

development programme. Each centre focused on analysis of teacher-child interactions to improve interactions designed to stretch children's thinking. Jordan developed a model of various levels of intersubjectivity to conceptualise the range of skills and processes in teachers' interactions with children. However, Jordan concluded that while sociocultural theory was accepted by teachers at the commencement of the study as a way to guide practice, they had yet to develop a sound understanding of it and its potential applications.

A second relevant study was responsive to curriculum change in the UK and designed for teachers to learn how to support children's literacy and numeracy during teacher-child interactions. Anning and A. Edwards (1999) supported a range of settings in a two-year professional development project. Their research project explored the development of a "community of understanding" through a research partnership between local authorities, practitioners and university based academics. Participants were one staff member from each of twenty settings: "day care, nursery schools, local authority special initiatives, child-minding and a work-based nursery at a local hospital" (p. 37). Each participant took on the role of a pedagogical leader in her own setting and both evidence-based practice and evidence-based inquiry occurred.

Supporting teachers' understandings of emergent literacy in order to improve the achievements of five-year-olds was the focus of Timperley's (2004) research. Seven participating schools developed their own processes for engaging in professional development. Two of these schools used analyses of student results as data to identify pedagogical approaches that could accelerate children's progress. By examining findings from all seven schools, and excluding other possible interpretations, Timperley was able to demonstrate that evidence-based inquiry, as an approach, was effective for teachers' learning about improving children's literacy achievements. Of further significance to the present study, shared dialogue and understandings enabled these teachers to discuss, compare and debate interpretations and decision-making about curriculum and pedagogy. Although Timperley states the schools were identified by the Ministry of Education because of a combination of political and socioeconomic concerns, an explicit sociocultural focus making links between families, cultures and communities was not made in this study.

Professional knowledge communities

Teachers' conversations have long been recognised as a source of professional growth (Yonemura, 1982) and illustrate the value of dialogue and shared expertise. Teachers meeting together to discuss professional issues provides a context to examine and interpret professional experiences and acts as a catalyst for change (Jalongo & Isenberg, 1995). The notion of professional knowledge communities, drawing on the work of Louis, Marks and Kruse (1996) is utilised in Anning and A. Edwards (1999) and Timperley's (2004) studies.

Louis et al. (1996) delineate five interdependent components present in such communities: firstly, a shared pedagogical purpose; secondly, shared beliefs about children and a focus on improving learning and teaching; thirdly, opportunities to develop professionally through collaboration; fourthly, deprivatised professional support; and fifthly, engagement in reflective professional dialogue. The fourth component is only relevant in early childhood education if differing teams were brought together as a professional community, as teachers already work in teams, rather than as individuals. A shared sense of purpose can take time to achieve and perhaps only emerges during processes of dialogue and action between colleagues. It becomes clear that professional learning must be seen as something integral to teacher development, rather than an external activity, and that organisational constraints such as time and space and access to expertise may impact on its success (Little, 1999).

The notion of professional learning communities has been popularly used and discussed in recent literature in flexible and diverse ways (e.g., Mitchell, 2003). Forming a professional learning community requires both cognitive and social foci and is a good example of distributed cognition (Grossman et al., 2001). Several authors support Timperley's (2004) finding that a shared subject focus, such as literacy, has positive outcomes for teacher development and student learning (e.g., Hollins, McIntyre, DeBose, Hollins & Towner, 2004; Shulman & Sherin, 2004). In the present study, the subject of shared focus is children's interests. Authors note that the term is commonly taken to mean shared purpose and positive notions of collegiality. Yet, confronting conflict and working on collaborative understandings may be critical to the development of robust professional knowledge communities

(Orland-Barak & Tillema, 2006); otherwise groups are simply under an illusion of collaboration (Grossman et al., 2001).

In short, while participation in a learning community may be helpful, it is insufficient in itself to impact on teacher practice and student outcomes (Timperley et al., 2007). External expertise is identified as a critical factor in successful professional learning communities (Gaffney, 2003; Timperley et al., 2007). Many of these studies involve university/practitioner partnerships, yet, in the literature located, only Butler et al. (2004) appear to clearly explicate the role the tertiary partner undertook, something Timperley et al. also note as a missing feature in the existing literature. The role of a researcher and/or professional development facilitator in engaging professional knowledge communities in dialogue, challenge and debate may be essential to maximising the effectiveness of such collaboration (Jordan, 2003). Jordan also suggests the facilitator needs to be highly qualified and have experience of the context. This gap in the provision of professional learning, and research on its effectiveness, informed the design of the present study.

Anning and A. Edwards (1999), Jordan (2003) and Timperley (2004) all used an evidence-based practice approach to teacher inquiry in the two differing ways identified by Davies (1999), and support that this has a positive impact on participants, particularly in their up-take and incorporation of relevant theory and research. Jordan's and Timperley's inquiry was confined to the individual centres/schools, unlike Anning and A. Edwards, who brought together individuals as representatives of their centres into a new learning environment. Jordan's and Timperley's studies support an argument for whole teams of teachers being involved for maximum impact on children's learning; Anning and A. Edwards' approach supports an argument for getting different groups with a common pedagogic focus together, rather than confining teacher inquiry to separate case studies. Bringing together two teams to form a community of inquiry in the present study seemed to combine the best of both approaches. In terms of the role of research and inquiry in teacher learning, Jordan and Timperley adopted a teacher inquiry approach before introducing theory and research, whereas Anning and A. Edwards had the introduction of theory and research as the first step. Considering research findings about the relevance of research to teachers' practice (e.g., Kennedy, 1997), and

Guskey's (2002) model of professional development and teacher change, the former approach appeared more appropriate for the present study to engage teachers in research of relevance and interest to them.

Effective professional learning that links children's (and teachers') learning

The three studies cited in the previous paragraphs were all designed to improve children's learning outcomes. A recent NZ review of the international literature on early childhood teachers' professional development (Mitchell & Cubey, 2003) identified eight characteristics of effective professional development linked to enhanced pedagogy and children's learning. Professional development incorporates participants' own aspirations, skills, knowledge and understanding into the learning context; professional development provides theoretical and content knowledge and information about alternative practices; participants are involved in investigating pedagogy within their own early childhood settings; participants analyse data from their own settings; critical reflection enables participants to investigate and challenge assumptions and extend their thinking; professional development supports educational practice that is inclusive of diverse children, families and whānau; professional development assists participants to change educational practice, beliefs, understanding, and/or attitudes; and professional development helps participants raise awareness of their own thinking, actions, and influence.

Timperley et al. (2007) form more tentative conclusions from their synthesis of professional learning that impacts on student outcomes about seven features that promote professional learning. These are: sufficient time is focused on learning opportunities; some form of external expertise is utilised (particularly to support integration of theory and practice); a focus on engaging teachers and learning; challenging problematic discourses; creating a community of professionals; ensuring content is consistent with policy trends; and having leaders active in professional learning opportunities.

In keeping with Timperley et al.'s tentativeness, Guskey's (2003) analysis of similar compilations of effectiveness suggests there is wide variation in what constitutes successful professional learning, and that the research base is inconsistent and contradictory. However, Liebermann and D. Wood (2001) are unequivocal: "The

history of professional development for teachers is the landscape littered with failed approaches" (p. 174). Traditional approaches to professional development typically focus on expert knowledge being shared with teachers. This model disseminates information "but often does not result in real and meaningful change" (Dana & Yendol-Silva, 2003, p. 6). In particular, the limitations of the one-stop workshop approach as "episodic and piecemeal ... doom[ing] any attempt to sustain intellectual community" (Grossman et al., 2001, p. 948) and unable to transform practice are well documented (e.g., Falk, 2001; Helterbran & Fennimore, 2004), yet these persist, likely due to time and financial constraints.

Timperley et al. found a range of influences, often context or discipline-specific, affected effectiveness. Despite their current tentative nature, Timperley et al.'s analyses could inform future early childhood professional development alongside Mitchell and Cubey's (2003). Given the characteristics, themes and studies cited in this review, it is clear that teachers' engagement in shared inquiry is a potential model for professional learning.

In short, exploring research evidence and its use in teaching practice presents challenges. Characteristics of effective professional learning that acknowledge teacher expertise, and use an evidence-based approach to ongoing inquiry into practice, point to collaborative inquiry as a way to explore current teaching practices, enhance relationships between theory and practice, and develop teachers in empowering ways. Further, the role and actions of the external facilitator in a community of inquiry between teachers and a researcher warranted careful planning and explication. The term "evidence-informed inquiry" was used in the present study in order to also take account of the notion of teachers' funds of knowledge and working theories as powerful informants to curriculum decision-making and part of the wide range of evidence teachers might call upon in their decision-making.

Summary

Teachers' professional knowledge is an important determinant of the quality of children's learning experiences. Yet, the role of theory and research in teachers' knowledge and practice appears to be constrained by a range of factors, so it is perhaps questionable how embedded sociocultural theory is in teachers' knowledge

and practice in NZ. Research on teachers' professional learning indicated there were no failsafe recipes for success. Nevertheless, teachers engaging in inquiry, in professional knowledge communities supported by external facilitation, appeared to be a successful model for professional learning. This would suggest three possible components of teacher inquiry: individual reflection, team inquiry and facilitated inquiry.

Further, because of the interpretive and intuitive nature of early childhood teaching, it is likely that many kinds of evidence, besides that of research and theory, inform teacher professional knowledge and decision-making. Research that investigated a range of evidence types and proposed a conceptual framework to explain them would be valuable among the current fierce debates about evidence-based practice. Funds of knowledge as a concept has recently been identified as a potential way to recognise evidence-informed practice and inquiry, but has yet to be incorporated into a framework.

Reviewing chapters two and three, sociocultural theories of learning and teaching lent themselves to the present study. Firstly, an emphasis on pedagogical relationships, dialogue, inquiry, theories of informal participatory learning and processes of knowledge building were useful in informing the study. Secondly, the roles of families and communities in children's and teachers' learning, encapsulated in the concept of funds of knowledge as a form of family capital, provided a framework to examine ways informal and formal knowledge might be co-constructed.

Sociocultural theories inspire expansion of methodologies and interpretations (Rogoff, 1998). How children, teachers and a researcher might co-construct inquiry within a sociocultural theoretical framework, and concepts to explain these emphases, was a focus of the methodology and interpretation of the findings of the present study.

Most studies cited in these reviews of children's and teachers' learning have employed qualitative, interpretive approaches. The studies reviewed indicated this was appropriate for the present study, in order to build research relationships and ascertain patterns and themes in children's interests and inquiries. Research that involves children as participants is a growing field. Those that have involved children (e.g., Brooker, 2002; Hedges, 2002a, Pollard, 1996) indicated ethnographic techniques such

as participant observation in children's natural learning settings for extended periods of time is likely to be effective in obtaining authentic data. Much research has focused on adult-child interactions, yet children's interests and inquiries may be enacted with peers (including siblings) as well. In addition, given the centrality of teacher-parent collaboration in children's learning and the role of children's community and cultural experiences, parents' knowledge of their children's interests and experiences might also be informative, as might children's perspectives directly. However, much existing research has not captured the voices of both families and children directly, with the notable exception of Prince (2006).

In relation to teachers' professional learning, Guskey's work (2000, 2002, 2003), in particular, indicated the field is wide open in terms of establishing what constitutes effective professional learning that impacts positively on outcomes for learners. Of most significance, the role of the external partner has rarely been explicated in existing studies. Successful studies (Anning & A. Edwards, 1999; Jordan, 2003; Timperley, 2004) had worked with teachers over a period of time (six months to two years). However, no studies appeared to have enabled the researcher to spend significant time understanding the context of the teachers' practices before introducing a professional learning dimension, and again pointed to an ethnographic approach as appropriate.

The literature reviewed led to the present study being responsive to all the propositions for future research suggested by Fler, Anning and Cullen (2004):

Effective practice reflects a culture of inquiry that involves a research-based discourse; teaching is central to quality early childhood education; pedagogical leadership is integral to achieving quality early childhood education; professional development *[learning]* is conceptualised as the co-construction of a community of practice *[the present study prefers the notion of a community of inquiry]*; an appropriate curriculum is co-constructed between children and significant others (peers and adults) and is underpinned by close home and centre partnerships; sociocultural framed assessment practices view knowledge as owned by a community of learners, rather than residing in individuals, and is about participants moving through understanding rather than simply mapping the end product or outcome; enacting sociocultural theory into practice requires active reconceptualisation on the teacher's part, and the effort and time needed for this shift has been seriously underestimated (p. 188).

Assumptions of the present study

Consistent with *Te Whāriki* (Ministry of Education, 1996), Inagaki and Hatano's (2002) view that children are "not only active learners but also theory builders" (p. 127) and Rogoff's (1990) identification of three human urges, "to connect with others (social), to understand the world (intellectual), to reveal oneself within it (personal)" (p. 46), the present study is based on the following assumptions: that children are keen to learn; eager to explore their environment; and actively initiate interactions to engage in inquiry in order to construct knowledge and theories. Learning in this sense begins with immersion in human language and culture, where concepts are increasingly made sense of through experiences and interactions with others until they are internalised, transform interpretations and are evident in actions (Dyson, 1999; A. Edwards, 2005). The interactions with others bring an affective element to the cognitive process of learning. Successful learners use both the knowledge of others and cultural tools to progress their learning, a notion Engeström, Miettinen and Punamäki (1999) describe as expansive learning. Such assumptions might apply equally to teachers who are motivated towards ongoing professional learning utilising the support of an external partner.

As the definition of curriculum in *Te Whāriki* suggests, children learn from every experience they are exposed to, that is, "learning is the default state for children" (Maddock, 2006, p. 155). From this perspective, curriculum exists that is not consciously planned or evaluated, children are exposed to a range of pedagogies, and their learning processes and achievements are not always immediately recognisable or documented. These informal or spontaneous approaches may rely on teachers having a breadth and depth of knowledge to draw on in a somewhat intuitive manner (T. Atkinson & Claxton, 2000). Moreover, a child's pace of learning will also depend on the child's ability to explore and employ support in a learning environment (Bowman et al., 2001). This support involves cultural tools such as play equipment, but these are resources rather than the curriculum per se (L. Wright, 2004). It is the pedagogical relationships children engage with that shape authentic, meaningful learning. The present study is also based on the assumption that teaching and learning for young children will be most effective when it recognises, engages with and builds on children's existing knowledge and interests gained from experiences in their families, communities and cultures in a co-constructive approach.

Research purposes and questions

As noted earlier, the purposes of the study were to:

1. increase knowledge about and bring coherence to understanding of children's experiences and teachers' enactment of an interests-based curriculum and pedagogy;
2. extend current knowledge of early childhood curriculum and pedagogy from a sociocultural perspective;
3. increase understanding about teachers' professional knowledge that supports children's authentic, meaningful learning during co-constructed inquiry; and
4. explore the role of the external facilitator in research partnerships to increase coherence between research, practice and professional learning.

Formulating research questions assists focus on the specific area of study while remaining responsive to the complexity of educational concerns. The questions most appropriate for the present study were process questions, those designed to describe how something occurs, develops or changes (Flick, 2006).

The central research question of the study was:

How might teachers, children and a researcher co-construct a community of inquiry in early childhood education?

The study was guided by the following sub-questions:

1. In what ways do teachers recognise and engage with children's interests in relation to children's experiences and funds of knowledge?
2. How do teachers choose whose and which interests will be engaged with in building a sociocultural curriculum during both planned and spontaneous teaching and learning interactions?
3. What professional knowledge do teachers use to assess and respond meaningfully to children's interests and inquiry and generate authentic teaching and learning programmes?
4. How might a researcher utilise research partnerships to blur the boundaries between research, practice and professional learning?

Chapter four

METHODOLOGY

As our methodologies become increasingly sensitive to the relationships of researcher to their subjects as dialogical and co-constructive, the relationship of researchers to their audiences as interdependent, and the negotiation of meaning within any relationship as potentially ramifying outward into the society, individual agency ceases to become our major concern. We effectively create the reality of relational process (Gergen & Gergen, 2003, p. 603).

Introduction

"Research is neither neutral nor innocent practice" (Sikes, 2006, p. 105). Ethical issues permeate all aspects of qualitative research (Mauthner, Birch, Jessop & Miller, 2002; Sikes, 2006). For Sikes, ethics requires attention to decision-making about research topics and choices of methodologies, methods and writing styles. Mauthner et al. acknowledge that ethics is an inherent part of relationships, actions and values in a community. In addition, interpretation in qualitative studies is an inherently political process reliant on the researcher's engagement with the participants and the data. Explicit engagement with the ethical dimensions of qualitative research will result in a study that is "more insightful, more useful, and more emancipatory in its consequences" (Ezzy, 2002, p. 34). As Gergen and Gergen (2003) highlight, sensitive relationships between the participants and researcher were vital to achieving the aims of this study.

Wolcott (2001) suggested qualitative research is now well established and needs no extensive justification. Recent writers have claimed much current qualitative research focuses on postmodern and post structural deconstruction and analysis (P. Atkinson & Delamont, 2006; Hatch, 2006). Hatch suggests "those who continue to think of qualitative research as data-based, carefully executed, systematic inquiry may [have] ... less space in which to operate" (p. 405). The present study locates itself within Hatch's description of systematic inquiry and responds to P. Atkinson and Delamont's (2006) imploring of researchers to avoid "smash-and-grab" (p. 749) data collection and instead use ethnographic approaches that produce rich data in a reflexive manner. Therefore, a careful and detailed explication of the methodology used in the present study is offered in this chapter, and its methods in the following one.

The chapter incorporates explanation and justification of the methodological approaches, and positions the researcher within the present study. The study's research design, located in qualitative and interpretivist research, is described. In addition, ways in which teachers and children were positioned actively and supported co-constructed, participative reflective inquiry to occur are reported. Within the methodology adopted, the researcher is the primary data generation agent (Graue & D. Walsh, 1998; D. Walsh et al., 1993), a term used here to denote the centrality of the researcher in the study. Ethical principles and procedures are explicated. Finally, considerations of validity in the present study are discussed.

Locating the present study methodologically

A range of research methodologies and methods have been used previously to contribute knowledge about curriculum and pedagogy in early childhood education. For example, quantitative and longitudinal studies have argued and debated long-term outcomes achieved by children who participated in some early years programmes (Marcon, 1999, 2002; Schweinhart & Weikart, 1997; Wylie, Hodgen, Ferral & Thompson, 2006). Ethnographic and narrative studies provided rich pictures of curriculum environments and relationships (e.g., Gallas, 1994, 1998; Paley, 1981, 1992, 1999). Action research by teachers contributed directly to change in practices (Blenkin & Hutchin, 1998; Jordan, 2003). Facilitated action research was a key contributor to trialling learning and teaching stories successfully (M. Carr, May & Podmore, 2002) and is currently mandated in research in Centres of Innovation (see Meade, 2006). In short, different research methods suit different research projects and purposes. No single all-encompassing research method exists. What is important to consider is the perspective a researcher feels comfortable in and methodology that will answer the research questions (Bouma, 1996; Flick, 2006).

The present study adopted an interpretivist methodology and drew on qualitative methods in its design and implementation. Qualitative research examines complex situations in an in-depth manner. Neuman (2006) describes the main features of qualitative research as follows: it aims to understand and construct social reality and cultural meaning; it focuses on interactive processes and events with authenticity as its key goal; its values are present and explicit; the researcher is involved in the study; and data analysis occurs thematically. Qualitative studies can have multiple purposes.

The present study is both exploratory, because little has been written on this topic, and descriptive, presenting a rich picture of situations, social settings and relationships.

Research design: Process, product and attitude

Bassey (1999) defines educational research as "critical enquiry aimed at informing educational judgements and decisions in order to improve educational action" (p. 39). From this perspective, research is a process, a product (A. Edwards, 2000) and also an attitude (A. Edwards, 2002). Such a description fits well with the purposes and design of the present study and its interpretivist methodology.

Interpretivist methodology: Research design consistent with sociocultural theory

Interpretivist research aims at understanding the phenomenon or events under study from the inside; linking to *verstehen* (understanding) as an epistemological principle in research, through appropriate methodology for one's theoretical position (Flick, 2006). Interpretivist researchers focus on the lived experience of people, place importance on attempts to understand participants' perspectives and actions, and develop methods flexibly and responsively during fieldwork (Berg, 2004; P. Hughes, 2001; Merriam, 1998; D. Walsh et al., 1993). Therefore, in keeping with sociocultural theory, cognitive and affective elements of human lives and learning are viewed as inseparable. D. Walsh et al. added that good interpretive inquiry requires extensive fieldwork and that meaning develops through dialogue and negotiation between the participants and researcher. This is consistent with the community of inquiry claim of Wells (2001b) that dialogue is "the discourse of knowledge building" (p. 185).

In the present study, an interpretivist approach had the potential to generate rich data and acknowledge the capacity of the researcher to be involved in the study. Human interactions were the primary sources of data. Further, the participants' perspectives and ability to understand others' viewpoints are key issues in the development of an inquiry orientation that develops shared understanding. To facilitate this understanding, the researcher and the participants needed to develop a close relationship, in order to understand meaning through dialogue and negotiation.

Using an interpretivist inquiry approach maintained consistency with the sociocultural theoretical perspectives that underpinned the study's literature, specifically an emphasis on social-constructivist perspectives that highlight reciprocal and responsive relationships in learning-and-teaching communities. In addition, within sociocultural theory, knowledge has historical origins, and is developed and owned in the tools and artefacts that communities and cultures use as well as in their oral histories and dialogue. Understanding the contexts and situated actions of participants is vital to interpretivist research.

A sociocultural framework, therefore, enhances understandings of the complexities of practice, alongside ways in which practice may be reflected on and developed through further inquiry and dialogue. Studies suggested it was not only research evidence that informed teacher inquiry and practice. Other forms of "evidence" such as mini (or working) theories (Claxton, 1990) funds of knowledge (Andrews et al., 2005; Gupta, 2006) and life experience (Yelland & Grieshaber, 2000) are likely to interplay in teacher decision-making. The term "evidence-informed inquiry" was adopted to reflect this change in emphasis on the relationship between research and practice in this study and in order to investigate the types of evidence teachers draw on.

Engaging in "close-to-the field research" (A. Edwards, 2002) allows a stronger relationship to be built between researchers and teachers. This positions the researcher as a collaborator in a "community of knowing" (Rogoff, 1998), highlighting the pedagogical relationships that the social-constructivist branch of sociocultural theory that this study locates itself in seeks to theorise. The present study also attempted to act on thinking about forward-looking research that develops a new version of research partnerships by blurring the boundaries between research, practice and professional learning (A. Edwards, 2001; Sebba, 2004), and positioning teachers as agents of change (Sebba, 2004). In this way, while participants "retain core membership of the communities whose practices are central to their work, [they also] become 'peripheral participants' in the overlapping communities" (A. Edwards, 2000, p. 198). In discussing the relationship between research and practice, A. Edwards (2002) suggests that an interpretivist methodology allows responsible research to occur. Earlier, A. Edwards (2001) acknowledged the risky nature of such research as it positions a researcher quite differently from traditional perspectives, and

relies on a trusting relationship between teachers and researchers, and a shared commitment to enhancing children's learning.

Likewise, Flick (2006) suggests ethnography has transformed qualitative research into a postmodern research attitude rather than an application of methods. The present study draws on ethnographic foundations. Ethnographic research has four features, all of which were present in the study's design: an emphasis on exploring social phenomena, rather than testing hypotheses about such phenomena; a tendency for unstructured data, that is, data that are coded after data gathering rather than gathering data about preset analytic categories; investigation of a small number of cases in detail; and analysis of data that involves interpretation and meaning-making about human actions and thinking, reflected largely in descriptions and explanations (P. Atkinson & Hammersley, 1998).

Similarly, sociocultural theory encourages research to focus on social interactions in cultural contexts and, therefore, for researchers to "engage in 'messy' fieldwork and practical problems, along with an acceptance of the challenge that such research often leads to claims of diversity and complexity rather than simple and reassuring certainties" (Loveridge, 2002, p. 7). Moreover, research that involves researchers and practitioners as co-creators of new knowledge can be validated in both academic and professional contexts. Such a model of professional learning and research recognises innovative practice and is potentially transformative (Meade, 2006; Sebba, 2004). Detailed field-based research in the form of case studies has the potential to inform pedagogy (A. Edwards, 2001) in critical ways.

Case study

A case study design allows the researcher to focus on a specific research topic within a specified context in order to identify several interactive processes at work (Merriam, 1998), and is frequently favoured by interpretivist researchers (D. Walsh et al., 1993). It enables the collection of detailed information from multiple sources, often labelled as "thick description" (Geertz, 1973, p. 6). The views of participants, the events of social and cultural situations, and the discourses and meanings underlying these, are examples of the way in which a case study approach gives an in-depth understanding of a situation and its meaning for those involved (Merriam, 1998).

Many definitions of case study exist. This study accords with Stake's (1994) concepts of an "exploratory" case study, as little previous research has been conducted on the topic, and an "instrumental" case study that refines theory or provides insight into an issue. Stenhouse's (1988, cited in Bassey, 1999) definition of an "educational" case study concerned with enriching the thinking and discourse of educators is also relevant. The concept of case study has also been described as an holistic research strategy that studies complex phenomena (Verschuren, 2003). In the present study, a case study approach was used to further support the generation of rich data and also acknowledge the position of the researcher as centrally involved in the study. A case study also provides the kind of detailed empirical data that allows the development of relevant and valid theory in an area that has been little researched. Emergent theoretical contributions can be linked to existing literature to enhance the validity, generalisability and theory building of the particular study (Eisenhardt, 2002).

Positioning teachers actively in research relationships

As noted, the notion of teaching being a research-based profession is now prominent. From the perspective of evidence-informed inquiry, this notion enables teachers to be positioned more actively in research (Dana & Yendol-Silva, 2003). Involvement in research increases teachers' commitment to developing their teaching practice and keeping up-to-date with new information. Teachers become more open to learning about teaching and feel positive about themselves and research. Teachers become more analytically critical about their own beliefs and assumptions and self-efficacy is increased (Henson, 1996; Meade, 2006; Stremmel, 2002). Studies involving evidence-based inquiry reviewed earlier (Anning & A. Edwards, 1999; Jordan, 2003; Timperley, 2004) further support such findings.

Participation in research legitimises talking about teaching and professional issues, and gives teachers the impetus to engage in specific professional dialogues. Given that adult relationships, communication and teamwork are identified as vital factors in quality early childhood settings, engagement in professional dialogue may improve curriculum and teaching practices in the setting. This may depend on sustained time spent in dialogue opportunities and/or the challenge of an external viewpoint. Hence, it is now appropriate to consider ways in which teacher inquiry may occur.

Teacher inquiry

Day (1999) links professionalism inextricably with inquiry and reflection. Guskey (2000) identifies teacher inquiry/action research as one of seven major models of professional development. Guskey claims such a model trusts teachers to formulate valid inquiries into their own practice and pursue finding answers to these. He also argues that teacher inquiry assists teachers to become more reflective, systematic and thoughtful decision-makers, and narrows the gap between research and practice. Schwalbach's (2003) ideas about action research as a process of investigation and an opportunity for reflective inquiry by teachers also apply generally to teacher inquiry. The result is improved practice because of the insights gained into learning and teaching. In this way, teachers also become more reflective.

Action research with a critical reflection slant appears to provide a broad and multi-faceted approach to qualitative research that impacts on teachers' and children's learning (Blenkin & Hutchin, 1998) and positions teachers as agents of change. While initially it seemed to be well-suited to the present study, several concerns became apparent. Firstly, in its original intention, it was an emancipatory approach to be owned by practitioners (W. Carr & Kemmis, 1986). To involve an "outside researcher" would appear to negate that ownership, unless approached carefully (e.g., see Blenkin & Hutchin, 1998; Jordan, 2003). Secondly, this study was driven by the researcher's questions, rather than by questions generated from teachers as occurs in action research (W. Carr & Kemmis, 1986; Schwalbach, 2003). Thirdly, many models of action research have been developed in the last 20 years, causing confusion for researchers and practitioners (Blenkin & Hutchin, 1998). Fourthly, evidence of children's learning is uncommon as either data or outcomes of the process of action research (Blenkin & Hutchin, 1998) with the notable exception of Jordan's (2003) study. A further concern about the use of an action research approach is raised by Kennedy's review of the value of educational research for teaching practice. Kennedy (1997) noted that the kind of research teachers find useful is that which informs them conceptually rather than prescribes action. Time and further experiences may be needed by teachers before changes in beliefs and practices occur (Guskey, 2002), rather than conforming to the cyclic process of action research.

Jordan (2003) described her approach as "co-constructed action research". While Jordan's research question about ways that children's thinking was extended drove the study, analysis of the dialogic interactions between teachers and children, and discussions with teachers, led to teachers acting on the findings and revisiting their practice in a cyclical fashion, typical of spiral of knowing. The concept of co-construction has been described earlier as an approach well-suited to inquiry-based teaching interactions between teachers and children in a sociocultural curriculum. Further, it provides a way in which research can be validated through both an outside researcher's knowledge generation and the collaboration of participants who immediately test results and findings (Greenwood & Levin, 2003). Jordan's approach could be construed as an attempt to overcome such ownership concerns and empower participants. Facilitated co-construction of research, if handled well by the outside researcher, can retain ownership of teaching and learning practices at the practitioners' level (Blenkin & Hutchin, 1998).

Collaboration between teachers and a researcher offers a way to generate inquiry, knowledge and action that is of direct use to teachers and also leads to public debate and dialogue. As MacNaughton (2003) points out, teachers "enjoy intellectual engagement; ... like thinking about the 'big ideas' behind their work; ... struggle to find resources that discuss and contextualize the 'big ideas' in ways that help them form their own positions on them" (p. 2). The present study was responsive to calls to support teachers by providing access to research-based information and inquiry opportunities about early childhood curriculum and pedagogy (Anning & A. Edwards, 1999; MacNaughton, 2003).

As noted in chapter three, facilitated teacher inquiry perhaps provides a useful model of teacher professional learning (Timperley, 2004). During involvement in research participation, teachers take ownership of data and changes to practice. The eventual goal is that inquiry becomes a professional positioning owned by the teacher that contributes to meaningful changes in teaching and learning practices (Cochran Smith & Lytle, 2001; Dana & Yendol-Silva, 2003). Through inquiry, teachers can make informed and systematic decisions, supported with evidence, and advocate for changes in curriculum and pedagogy. Furthermore, teachers' professional growth and children's authentic learning do not follow an orderly progression (Jalongo &

Isenberg, 1995). Therefore, flexible, responsive research methods that position teachers and learners actively were appropriate.

Co-constructed, participative reflective inquiry

A participatory view of inquiry allows individuals to be situated within groups and communities and is consistent with a participatory view of learning central to sociocultural theory. The three main objectives of participatory research are gathering and analysing information, strengthening community ties and sharpening critical thinking capabilities (Park, 2001). Further, and consistent with community of inquiry perspectives, Park views dialogue as the central feature uniting these objectives and the knowledge that is created as a result of such research.

In relation to teacher inquiry, Zeichner (1993) stresses that while clarifying beliefs and practices "the challenge and support gained through social interaction is important" (p. 12). In early childhood education, teachers do not teach autonomously, but in teams. Shared meetings between teams of teachers from different centres were envisaged in the present study as a way to form a new community of inquiry. Anning and A. Edwards (1999) thought such networks could bring together ideas about current practices, allow them to be challenged by external insights and develop shared understandings that would inform future decision-making.

The notion of a community of inquiry was chosen as a framework for the present study to highlight the importance of meaningful questions, dialogic inquiry and new insights and knowledge building in such an approach, alongside the link made earlier between children's interests and an inquiry disposition. From a sociocultural perspective, a sense of community is built through language and dialogue. Stories of practice, informed by evidence and research can be a useful means of professional community building and sharing meaning (Anning & A. Edwards, 1999). In this way, A. Edwards' (2001) thinking about forward-looking research that develops a new version of research partnerships by blurring the boundaries between research, practice and professional learning also becomes foregrounded. The presence of a researcher might offer challenges teachers may not notice or choose to address, and/or encourage stronger articulation of the theory and research that underpins teaching and learning practices.

In considering the challenges outlined in the literature in relation to teacher inquiry and collaborative and action research, and given the theoretical frameworks of sociocultural theory and communities of inquiry, the approach taken in the present study is described as "co-constructed, participative reflective inquiry". Several levels of inquiry impacted on each other: children's inquiry, teachers' inquiry, the researcher's inquiry, co-constructed inquiry between teachers and children (including the researcher in a teaching role), and co-constructed inquiry between teachers and the researcher. In addition, to acknowledge the centrality of families in the learning communities children participate in, parents' contributions were sought. Their understandings illuminated and extended teachers' and children's understandings, in particular providing insight into the funds of knowledge accumulated in a range of family and community settings that influenced children's play and interests in the early childhood centre setting.

Therefore, notions of relationships and communities, and shared understandings and negotiation through collaborative inquiry, were central to the study's inquiry questions and methodology. In this way, the co-constructed dialogue, distributed cognition and reality of a relational process outlined by Gergen and Gergen (2003) in the opening quotation of this chapter were enacted. Consistent with the theoretical and methodological underpinnings of the present study, the relationship between the researcher and the participants was critical to the generation of rich data that impacted on teaching and learning practices.

The role of the researcher

In an interpretivist approach the researcher is not neutral and is the main data generation agent (Flick, 2006; P. Hughes, 2001; Lincoln, 2001; Merriam, 1998). The researcher's role and relationships with participants are vital to the study's findings. Which information can be accessed, and what is withheld, depends on the positioning assigned to the researcher by participants (Flick, 2006). The researcher's reflexivity or subjectivity, specifically reflections on her own actions and observations in the setting, also becomes part of the data generation and interpretation to document and justify decision-making (Flick, 2006).

Given that the researcher's role is far from neutral, the following outlines some of the considerations of the role of the researcher relevant to the present study.

Recognizing the critical nature of the observer's role and the influence of his or her subjective assessments in qualitative work makes it all the more important to have readers remain aware of that role, that presence. Writing in the first person helps authors achieve those purposes (Wolcott, 2001, p. 21).

From this point, the first person style is used in this report.

Researcher capital and baggage

"Researchers ... come to the practice of research with their own mixtures of capital and baggage" (A. Edwards, 2000, p. 186). Such baggage might be referred to as the funds of knowledge a researcher brings to a study. Neuman (2006) and Miles and Huberman (1994) asserted that a researcher must clearly state her personal values and Denscombe (2003) that biographical information should be provided, as ethical elements of validity. By making my own capital and baggage transparent, accountability for choice of data generation and analysis techniques and the study's argument are offered (Denscombe, 2003; Groundwater-Smith & Dadds, 2004).

My values or assumptions about children have been identified as conforming to an image of children as capable, confident and eager to learn and inquire. I have also been influenced by my own experiences of young children's interests as a parent and teacher. I believe that young children's interests and inquiries are often serious and sustained over a long period of time. My two children's childhood interests continued to influence subject choices, extracurricular activities at school and possible career choices during young adulthood. Further, their interests and inquiries have shaped in fundamental ways their identities, social relationships and interactions. I also believe inquiry is a deeply-absorbing and enjoyable activity central to human functioning that can manifest itself in various ways.

In addition, my experiences in early childhood teacher education (initial and ongoing professional learning) have contributed to two strong beliefs: firstly, the value of professional knowledge for optimising children's and teachers' educational experiences and outcomes; and secondly, the potential benefits for maximising children's learning and teachers' ongoing professional learning of a dialectic

relationship between theory, research and practice. These beliefs about teacher development were implicit in the purposive sampling of qualified teachers in this project. I have also noticed that the range of personal and professional knowledge, experience and interests adults bring to their own teacher development and inquiry often influence the direction and nature of learning and subsequent shifts in practice. Further, like Nieto, Gordon and Yearwood (2002), I trust teachers and believe processes of dialogue will not bring about "fairyland conclusions about 'best practices' ... but to some satisfying ideas that might change how we - all of us - teach" (p. 346). Further, I concur with Guskey (2002) that teachers need to see evidence for themselves before they will change beliefs and practices.

I have clearly located myself in sociocultural theoretical approaches to curriculum, pedagogy and inquiry, consistent with features of ethnographic research that incorporate "messy" fieldwork. In terms of relationships with research participants, I value respect, reciprocity and responsiveness in the relationships guiding the research process (see Cullen, Hedges & Bone, 2005). The same pedagogical principles are valued in my teaching practice and were applied during the shared inquiry sessions (see also Cordingley, 2004).

Positioning the researcher as the central data generation agent

Bratman's (1992) philosophical perspective of collaborative adult partnerships provided a useful lens for viewing the teacher-researcher relationship of the present study, through links to principles of sociocultural approaches. Bratman defines three aspects of partnership: mutual responsiveness, commitment to joint activity and commitment to mutual support. This suggests the findings of the study would be co-created, and the knowledge and shared understandings that resulted co-constructed between the researcher and participants (Lincoln, 2001). Fruitful research relationships take time to build. In the present study, the potential to bring together research and teaching contexts to mutual benefit as both "move towards key principles of mutual understanding and respect" (Allen & Bisplinghoff, 1998, p. 61) occurred.

Case study is a methodological approach that incorporates a number of data generating techniques for multiple sources of evidence. A researcher needs to be

flexible, a good listener, observer and inquirer. Moreover, Neuman (2006) states that exploratory researchers are creative, open-minded, adopt an investigative stance and explore all sources of information. They also take advantage of unexpected or chance factors. In addition, my role as researcher became more complex and multi-faceted in order to understand, challenge and shift teacher practices.

While details about methods are provided in chapter five, the next section of this chapter foregrounds them in relation to positioning me within the study. Again consistent with my values, in each setting, naturalistic observation methods were used. Such methods are viewed as essential to understanding children's social learning (Corsaro, 1985) and teachers' everyday practices. Therefore, I participated with teachers and children engaged in their everyday teaching and learning. My relationships with the children are described later in the section on ethical responsibilities; here my focus is on relationships with the teachers.

Participant observation has been defined as an open-ended and flexible strategy that combines interviews, participation, observation, reflection and document analysis (Denzin, 1989, cited in Flick, 2006). In each setting, while I took time to get to know the context and realities of teaching practice of the participants, I did not become a "complete participant" (Gold, 1958, cited in Flick, 2006) in terms of being embedded in each research setting, likely assisted by being in two settings concurrently. Nevertheless, a "blurring of the boundaries" (Lincoln, 2001, p. 126) occurred at times in the research relationship; therefore, the "participant-as-observer", the step just below complete participant in Gold's typology, is most appropriate to describe my position in terms of my distance from events in the setting. In relation to the group inquiry sessions, firstly, teachers needed sustained blocks of time to focus on discussions. Secondly, the group needed to build relationships of trust and responsiveness in order to feel comfortable about revealing practices, concerns, disclosing information and taking risks. It was my responsibility to ensure this occurred.

Nevertheless, in a long-term project, the mediating effect of me as the researcher meant that I inevitably became part of the setting in some way and therefore influenced both the research and teachers' practices. For example, from early on in

the fieldwork, as both centres were improvement-oriented, teachers accessed me for dialogue about current thinking and practices, viewing me as having some expertise. An early fieldnotes entry from one centre noted this, and in an analytic comment, its similarity with Loughran's (2003) thoughts about teacher research: "the traditional research notion of *holding the problem in place while it is researched* is not really possible for teacher-researchers as the problem develops, shifts and changes in response to the continual shifts in the teaching" (italics in original, p. 182).

Role choices throughout the study frequently required decisions about how much to participate personally in the case, how much to allow myself to be accessed as a resource, how much knowledge and understanding to reveal or contribute, whether and when to be neutral or evaluative or challenging, how to challenge and be critical without taking over or exerting power, how much to try to anticipate results and/or provide interpretations, and whether or not to advocate a position or just be myself (see Stake, 1995). Jordan (2003) suggests transparency in roles is vital. I chose and explicitly stated to the teachers early on that I was there to learn, not to make judgments or comments. Challenging practices did not occur until six months into the fieldwork.

A "critical friend"

While the teacher participants and I developed a close relationship, there was also recognition of difference: different jobs, different purposes and different accountabilities (Clandinin & Connelly, 2000). In relation to this, I adopted the role of a "critical friend" (Costa & Kallick, 1993) to make choices about data generation and to collaboratively analyse and discuss findings with the teachers. Costa and Kallick define a critical friend as:

... a trusted person who asks provocative questions, provides data to be examined through another lens, and offers critique of a person's work as a friend. A critical friend takes the time to fully understand the context of the work presented and the outcomes that the person or group is working toward. The friend is an advocate for the success of that work (p. 49).

Building a collegial relationship based on trust, collaboration, being non-judgemental and supporting practice was essential to the study. This takes time, energy, patience

and a commitment to the inquiry process (Nieto et al., 2002). This is consistent both with the methodological approach chosen and evidence about successful professional development in NZ (Mitchell & Cubey, 2003). Further, the definition of critical friend that I chose for this study made explicit my role and purpose, thereby reducing any potential power dynamic that may have otherwise been an issue, and any preconceptions or expectations in relation to teachers' understanding of my university position. In addition, this role assisted me to keep a balance between obtaining an internal perspective and maintaining an external perspective (Flick, 2006).

Thus far, this chapter has described and justified the qualitative, interpretivist methodology of the present study. A brief description of the research design is provided now, in order to then examine issues of ethics central to all data generation. Further details of the design, participants and data generation and analysis techniques are included in chapter five.

Research design: An overview

The study took place in two early childhood settings: one sessional public kindergarten and one full-day centre. Teachers and children in both settings were participants in the study, along with the parents of 11 children. During year-long fieldwork, I drew on participant observation techniques in weekly half-day attendance at each centre, interviews, documentation and co-constructed inquiry discussions as sources of data. Fieldnotes data about children's interests, and teachers' engagement with these, occurred during everyday teaching and learning episodes. Individual and team interviews occurred, along with interviews with children and parents in family homes. In the latter part of the year, the two teaching teams met for facilitated inquiry sessions. Preparation for these sessions incorporated reading research and theoretical literature, largely from a sociocultural perspective, and examining examples of their documentation of children's learning.

Ethical considerations: Process, product and attitude

Ethical concerns are an important aspect of the process of qualitative research and involve careful decision-making before, during and after fieldwork (Sikes, 2006). Huberman and Miles (1994) assert that the researcher's values should be explicitly identified as part of the ethical concerns that must be attended to. My values have

been explicated in the section on the role of the researcher. Case study research is grounded in a real life context and can be intense. Negotiated permission based on respectful relationships is required. In this study, ethical principles of voluntary participation, informed consent, social and cultural sensitivity and minimising harm were considered. The study conforms to Massey University's code of ethical conduct and was approved by the Massey University Human Ethics Committee, reference number 04/64, and the Auckland Kindergarten Association's Research Access and Ethics Committee on January 21, 2005. The ethical principles, procedures and some dilemmas experienced in this project are now outlined.

Ethical principles and procedures

Ethical principles are values that I adhere to strongly. I have scrutinised and challenged these previously, in a manner that is respectful of both adults and children and acknowledges their contributions to the research process and publications (Billman, Geddes & Hedges, 2005; Cullen et al., 2005; Hedges, 2001a, 2001b, 2002b; Hedges & Cullen, 2003). The following interprets ethical principles and explains how these were applied in terms of procedures used in the present study.

Informed consent

A kindergarten identified by the kindergarten association management and me as suitable for participation in this project agreed to be approached and the second centre's owner/manager gave permission for staff to be approached. Subsequently, I met with the group of teachers in each centre separately, explained the study and its purpose, what their involvement would entail, provided them with participant information sheets and consent forms (appendices 1 and 2) and answered questions they had about these matters. Both centres' teachers commented that the definition of a critical friend and the amount of time I would spend in the centres with them (six months) before offering a form of professional learning were sources of "buy-in" to participation in the study. Most teachers consented to participate within one week of the meeting. I put no pressure on the other teachers. The first two weeks of my participant-observation enabled them to see what I would be doing in a researcher role, assisted us to develop relationships and allowed them to evaluate my interactions with teachers and children. Eventually, the entire teaching teams present on the fieldwork day in each centre consented to participation. The teachers also discussed

confidentiality issues and an appropriate process for verifying group transcripts. A protocol for access to artefacts involved in curriculum planning and evaluation was negotiated.

In the case of young children, the ability to consent to participation in research is problematic, but is possible (Alderson, 2005). Young children's ability to give consent depends significantly on the efforts of the researcher. Parents and children were informed of the project by centre newsletters, a poster on the parent noticeboard and each family receiving a participant information sheet (appendix 3). Parents' consent to participate and approach children was sought first (appendix 4) followed by the children's consent or assent being sought.

A distinction between "consent" and "assent" (Tymchuck, 1992, cited in Morrow & Richards, 1996) is important to explain in relation to this study. Proxy consent from parents was used initially to obtain infants' and toddlers' participation as they were too young to understand the notion of consent. However, I was careful to ensure that my interactions were not intrusive with these children, indeed any children, and was constantly aware of the power imbalance potentially present. Over the first few weeks, it became clear that one infant did not particularly welcome my presence, nor did one four-year-old child. Viewing this as dissent, I did not pursue these relationships.

Once rapport was established and relationships began to be built through my involvement with the children, the project was discussed informally with 3-5 year-old children at each centre. For most child participants, this verbal consent was judged sufficient evidence of their making a choice to be part of the study. Full consent, in the form of consent sheets completed by children (appendix 5), was sought for the four-year-old children who were also interviewed in their family homes. The processes involved in the written consent form were consistent with both approaches to educating children about consent to participation in research (David, R. Edwards & Allred, 2001) and participation in early literacy practices consistent with sociocultural theory (Göncü & Katsarou, 2000). At one centre, this took place at the centre by gathering participant children together at a table after morning tea. At the other centre, this was not possible. Instead, participant children completed a consent

sheet just prior to undertaking the interview at their home. One full participant child began attending afternoon sessions at the kindergarten halfway during the field work. His mother extended consent to the second case study setting.

Voluntary participation

The second ethical principle underpinning the study was that of voluntary participation. During the initial stages of fieldwork, I was careful to position myself where teachers who had given consent were. Later, I had freedom to move around as all teachers had consented to participation and were involved in ongoing dialogue. During phase two, if teachers had other commitments, I did not pressure them to attend all of the group inquiry sessions. Three teachers each did not attend one session.

When there were relief teachers or student teachers in each centre, I was very careful about my actions. I did not position myself where they were, nor did I note their interactions with children. At the full-day centre, there was a policy that relievers did not change nappies or engage with the children's sleep routines. This meant that, if a reliever was present, the older children had the reliever with them for their lunch and subsequent play period. On these occasions, I left the centre a half-hour earlier than usual. This action was in contrast to that of Thorne (2004) who described herself as having "an observational feast on a day when there was a substitute teacher who 'couldn't keep control'" (p. 258) present. I did not regard it as ethical to remain with children when a reliever was in sole charge.

In relation to the children, I continued to be alert for assent and continued voluntary participation throughout the project. This was responsive to the children's immaturity, and the suggestion by Alton-Lee (2001) that the process of consent can continue to be actively negotiated as each part of the data generation procedure occurs to ensure ongoing participation is indeed voluntary. As time went by, it was commonly the children who initiated our interactions, which I interpreted as a further sign of ongoing consent to participation. These relationships needed to be respected, and often reminded me that it was indeed relationships that determined what data were generated from among the myriad of possibilities in complex and busy early childhood teaching and learning environments.

A further element of ongoing voluntary participation that indicated children's understanding of my purpose and role was the way in which children assisted me in the research process. At one centre, the children became very interested in the research tools. I bought the children a notebook and pen like mine and allowed them to use my camera to take their own photographs. Again, this often demonstrated their understanding of my role and actions, notably when a two-year-old sat beside me, described what children were doing in the sandpit in front of us while "writing" in the children's notebook and a four-year-old recorded our interaction on my camera.

One unanticipated event in relation to participation resulted from the turnover of children attending the centres, particularly the kindergarten which has a 100% turnover over a calendar year. New children from April onwards were not officially invited to participate, but many were clearly curious about my presence. As a way of checking participant children's ongoing understanding of the research, I often asked them to explain my purpose and actions to new arrivals. Similarly, both centres had other adults present at times who wondered what my role was. As anonymity of the centres was not an issue (see next section), the children often explained my presence to visitors in ways that indicated they understood the range of data generating techniques employed.

Minimising harm and maintaining sensitivity

Traditional notions of minimising harm in educational research tend to focus narrowly on concerns such as not altering the teaching and learning environment unduly or issues of anonymity and confidentiality. There were no changes made by me to the learning and teaching environment, but my presence heightened attention to relevant curriculum matters. Consequently, changes occurred as a result of teacher thinking and inquiry during the year. Naturalistic observation methods were used. The principle of sensitivity also influenced the techniques used. For example, the presence of tape-recorders and video cameras at the centres may have altered some teachers' and children's participation in learning experiences and therefore were not used.

Anonymity and confidentiality are impossible to guarantee in a meaningful way in a long-term project that involves group interactions and discussions as part of its data generating, and where many people not directly involved with the research know the identity of the researcher (Walford, 2005). It was agreed at the commencement of the research that the centres would be acknowledged by name in the report. However, confidentiality was appealed for in terms of not sharing information about the other centre outside the group discussions. The principle of credit for individual participants was negotiated at the conclusion of the study. All teachers consented to have their names used, and parents consented on behalf of the children. Parents' names are not used in the report to reduce confusion between the names of adult participants. Further, family surnames are not revealed. The names of the centres are identified in the next chapter. This aids validity as some material presented can be verified externally (Walford, 2005); for example, through Education Review Office reports.

Owing to the long-term, close relationship necessary between participants and a researcher, more important issues related to minimising harm and maintaining sensitivity in this type of research included possible negative effects on individual participant's self-image or the possibility of participants feeling deceived or cheated by the process and/or the findings. Hence, my role and conducting myself ethically and professionally, particularly during phase two of the study when facilitating critical reflection, with an eye out for effects on the participants, was crucial in attending to the principle of minimising harm.

In addition, research should not add any difficulties to families' lives or cause negative feelings about children's education. The interviews in the family homes (see pp. 121-122), a venue I had not interviewed in previously, created four dilemmas. The first was that some parents wanted to engage in discussion about the quality of the centre. I listened to them and offered occasional comment, but avoided engagement in comparisons, just as I do in my professional life. The second was what Yee and Andrews (2006) describe as the dilemma of identity between being the researcher and the "good guest". By the time of the interview, I knew many children and their parents well and was warmly and hospitably welcomed in the home.

However, I found it difficult to manage offers of refreshments while also undertaking an interview, especially if the child was distracted by these.

Thirdly, I had not anticipated the curiosity of older school-aged siblings who were present at some interviews. They often participated even though they had not undergone consent processes. In relation to this, I took guidance from the parent present: if she allowed and encouraged the sibling to contribute I took that as assent; if she discouraged it, I also respected that. This chance event was however enlightening with regard to children's funds of knowledge and interests, and consistent with the theoretical underpinnings of the study. Finally, during one interview in the family home, despite their active participation with me at the centre and having just completed their consent sheets, the children demonstrated their interests overtly by using them to subvert the research agenda. The children were clearly keener to spend time playing with their mother and each other than participating in the research in the home environment. It seemed contradictory to the topic of the research to deny them that opportunity. I interpreted this as a sign of dissent and concluded the interview as quickly as possible.

More importantly, research should have benefits for the participants. Commonly in qualitative research, researchers take responsibility for supporting participants to act on findings. This is critical to the trust and integrity of the research and the research relationships. The purpose of the co-constructed reflective inquiry in the present study was to support change and improvement. There was some evidence that teachers' knowledge and practice were improved by participation and that parents' understanding of their children's learning was enhanced (see chapters six and seven). For children, the benefits were that there was another adult they could choose to interact with who demonstrated much interest in their lives. Data in the form of re-written fieldnotes and photographs of significant events were sent to some families.

Flinders' (1992) relational ethical theory was considered during the data generating, analysis, collaborative inquiry and reporting procedures. This theory emphasises caring and respect, and the importance of an ecological basis for decisions. For example, no questions were asked of teachers or parents that prompted dissatisfaction with the curriculum or programme being offered. The research was not intended to

create unease or dissatisfaction and therefore adversely affect participants or the centres. Participants were collaborated with, fieldwork avoided making any impositions, and the teachers participating collaborated in the analysis and discussion of findings and read draft reports. Understanding ethics from a relational point of view relies on the ethical integrity and resources of the researcher to deal with the "grey areas" of research that inevitably occur with human participants (Clandinin & Connelly, 2000).

A further consideration in relation to minimising harm and maintaining sensitivity is that having developed a close long-term relationship, ending the relationship reluctantly is likely for some participants (Clandinin & Connelly, 2000). While the literature recommends gradually easing out of the setting (e.g., Merriam, 1998), children's experience of child peers and long-term visitors was that they attended intensively and then exited with the knowledge of children. Therefore, this form of exit from the period of participant-observation occurred in this research in relation to the children, while the teachers and I have transitioned into a new form of future professional relationship.

Ethical procedures: A summary

The project was approved by Massey University and the Auckland Kindergarten Association's ethical clearance procedures. Once ethical clearance had been gained and centre management access obtained, each centre was approached and information and consent sheets sent to the teachers. After meetings and initial fieldwork beginning, all teachers agreed to participate and appropriate protocols were negotiated.

Parents and children were then informed of the project. Informed consent was obtained from teachers, parents and four-year-old children, with ongoing attention to assent and dissent among child participants. Fieldwork took place over a calendar year (2005) without any changes to teaching and learning environments and routines. Relationships were central to ethical conduct throughout the study. Ethical considerations are one way in which the validity of a project can be judged. Further elements of validity are now addressed.

Validity in qualitative research: Process, product and attitude

Much discussion occurs in the literature on qualitative research about validity; the degree to which a study can purport to be sound, rigorous and accurate in terms of results and findings, and generalisability. Of relevance to the present study, recent discussion of validity in applied and practice-based research suggests that alongside methodological and theoretical validity, notions of dialogue, participation, ethics and personal growth might be included (Oancea & Furlong, 2007). However, clear criteria are yet to be agreed upon, therefore this discussion is confined to well-established criteria for qualitative research.

Ezzy (2002) identifies interpretations of validity and rigour for qualitative studies as: research getting close to the world of people being studied to notice the detail of their experiences and interpretations; research that provides a rich and clear description of experience; a focus on the processes of construction and transformation of experience; an appreciation of subjectivity; tolerance for complexity - simple explanations are unlikely to be appropriate given that people's lives are complex; positionality - the written report must identify the author's position; communities (academic, community and political) as judges of the quality and value of research; and sharing credit and privileges that result from research with participants. I argue that my approaches to this research meet these criteria and outline ways in which this was enacted throughout this report.

Certainly, concern for trustworthiness, authenticity, credibility, dependability, transferability and confirmability in qualitative research procedures (Denzin & Lincoln, 2003; Guba, 1981; Huberman & Miles, 1994) is now considered more appropriate than positivist notions of validity and reliability. After all, it is not strictly the data itself that can uphold concepts of validity, but the researcher's interpretations (Ezzy, 2002). To this list, Huberman and Miles (1994) add attention to ethics, which has already been explained. These process, product and attitude views of validity are now explored further.

Credibility and dependability

Credibility and trustworthiness refer to the researcher's ability to take account of the complexities of the research environment and the data gathered during the research

process. Rich descriptions of contexts, participants, incidents, actions and interactions were gathered in the present study through a range of data generating techniques. The techniques and procedures are explained clearly in the next chapter, so a reader can follow both the study and its findings and conclusions. Prior to beginning the group inquiry, I checked with the teachers that I knew the contexts of the study well, not only for accurately describing the topic of study, but to be faithful to the definition of critical friend. Further, much verbatim data are included as evidence in the findings chapters; this is both consistent with an interpretivist methodology and in keeping with evaluative research that has explored the clarity of links between data, interpretation and conclusions in qualitative research (Corden & Sainsbury, 2006).

Dependability refers to the stability of the data across a range of settings, time periods and participants. Denscombe (2003) and Guba (1981) recommended that two or more data gathering techniques be used to increase stability and that data gathered be open to audit by others. The present study used several data generation techniques, was supervised by academics and subject to member checking by teacher participants.

Triangulation is a term given to investigating a research problem using a variety of data sources, multiple methods to study the issues or multiple theoretical perspectives to interpret the data (Denzin, 1978, as cited in Janesick, 2003). Pollard (1996) argues a study may be empirically valid if it contains rich triangulated data that support theoretical interpretations. Flick's (2006) view of triangulation is the use of as many perspectives as possible in data gathering and as seeking convergence in interpretation. This idea leads to the perhaps richer concept of crystallisation (Janesick, 2003; Lincoln & Guba, 2000; L. Richardson, 1994). Rather than the flat triangular approach, this metaphor recognises the many lenses and "planes" or viewpoints through which data can be generated and analysed. Multiple sources provide a sense of clarity in the data analysis and interpretation. Lincoln and Guba suggest the crystal metaphor describes well "the interweaving of processes: discovery, telling, storying, representation" (p. 182). Certainly, in the present study, multiple data generation techniques and particularly the seeking of children's perspectives provided rich data and enabled progressive in-depth theoretical analysis to occur.

Validity and generalisability

Validity refers to the way that a study accurately describes the phenomena investigated. To this end, internal validity in a qualitative study involves using multiple data sources over a period of time and drawing on participants' responses to the findings and interpretation. These factors were covered in the present study through the length of time spent in fieldwork and member checking.

There is broad agreement in the literature that external validity, or generalisation, is not an essential outcome of qualitative studies. Stenhouse (1988, cited in Bassey, 1999) comments that "generalisation and application are matters of judgement rather than calculation" (p. 49). Others suggest that, because a case study allows deep investigation and intensive analysis, generalisations to the wider population are possible (Cohen & Manion, 1989). Transferability refers to acknowledging the context-bound nature of the study (Guba, 1981; Huberman & Miles, 1994). The researcher's goal is not to generalise to other contexts, but to provide enough descriptive detail about the research contexts to enable readers to make their own judgements about transferability. In the present study, multiple case study settings increase the rigour of the study and the veracity of its findings. Validity and reliability are assisted, as conclusions from differing data sources and multiple sites are stronger than those from one source. Authenticity, plausibility and believability of the study are aided in this way. While this study makes no claim that the descriptive data analysis is necessarily generalisable to other contexts, I argue that the theoretical analysis of the study's findings is generalisable beyond the settings of the present study, and that this analysis has broad implications for early childhood curriculum and pedagogy and teachers' professional learning.

Validity in the research report

The criteria of resonance, rhetoric, empowerment and applicability (Lincoln & Guba, 2002) were applied to the research report. Resonance is the degree of fit between the report and the belief system the researcher has followed. Specifically, this means that the present study reflected the multiple realities and the social construction of the inquiry processes of the participants and researcher, and was consistent with sociocultural theory, particularly the social-constructivist perspective. Secondly, conscious reflexivity on the part of the researcher, examining roles and participation,

is essential to this form of validity. I have explained the researcher capital and baggage brought to the study along with discussion on my centrality to the study, roles, and dilemmas experienced. Thirdly, rhetorical criteria relate to the structure of the report: its organisation, quality of writing, logic and the flow of the argument. These I have attended to conscientiously with the support and critique of supervision. Fourthly, empowerment criteria are assessed by the ability of the study to generate action in relevant professional fields. The two case study settings made changes explicated in chapters six and seven. Finally, applicability criteria are the extent to which inferences may be drawn by those in similar contexts or situations. This criterion is yet to be met, subsequent to the study's completion, but suggestions for how this might occur are in chapter nine.

It is important that a study can be scrutinised by both the research community and professionals of the discipline or field under study. In the research community, research should be judged in terms of its success in investigating the topic and the rigour of the investigation. The process, product and attitude views of validity described in the previous paragraphs have been used as principles and guidelines in the present study's choice of design and methods. As Huberman and Miles (1994) point out, no one study could attend to all these criteria equally. However, attention to these criteria in some respect further strengthens the robustness and validity of the study.

Summary

Qualitative methodology is well-established within educational research, but each project must explicitly justify its methodological decision-making. Consistent with the rich potential of a sociocultural approach, an interpretivist case study methodology incorporating naturalistic participant observation, along with facilitated teacher inquiry, formed the methodology of the present study. Both theoretical perspectives and values informing the present study have been described, including positioning the researcher. Ethical principles and considerations of validity and generalisability have been explained.

Chapter five

METHODS

How social relationships, ideas, or activities become resources for thinking ... must be studied in relation to the concrete and varied practices of human beings. (González, Andrade, Civil & Moll, 2005, p. 261)

Introduction

Chapter five describes the methods of the present study. Firstly, the settings and participants of the study are introduced, followed by description of the data generation methods. Finally, the data analysis methods are outlined and the rationale for the conceptual framework of funds of knowledge used to discuss the findings explained.

The research settings

Children's interests and inquiries may vary in different communities and cultures, and the educational contexts within these. However, Lindfors (1999) suggests it is important that researchers confine themselves to contexts that they understand. Certainly, researchers will be most alert to inquiry discourse in familiar contexts. In other contexts, researchers run the risk of overlooking, diminishing or misinterpreting inquiry acts (Lindfors, 1999). Hence, I approached participants in contexts familiar to me; that is, mainstream early childhood centres that utilise children's interests and *Te Whāriki* as the source of curriculum planning. The two centres, their teachers and the children who participated in the study are introduced in this section.

Purposive sampling was used to find suitable settings and invite their involvement in the present study (Berg, 2004; Neuman, 2006). Not only are teacher qualifications commonly cited as a key determinant of quality pedagogical relationships in early childhood education (e.g., Howes, 1997; Siraj-Blatchford & Sylva, 2004), three further studies that investigated professional development provide guidance and justification for the use of a purposive sample. Gould (1998) found that teacher qualifications were important to assist understanding of and motivation towards professional development. Blenkin and Kelly (1997) gleaned that most of the successful case studies in their research on links between beliefs, research and practice occurred where there were qualified staff. Moreover, intrinsic motivation is critical to the success of professional development (Hampton, 2000).

Furthermore, for research to be effective, some researchers suggested that participants ought to be selected on the grounds that they have necessary knowledge and experience of the issue or topic, have the capability to reflect and articulate, and are keen to participate in the study (e.g., Morse, 1998). Other studies of teacher inquiry and development support that a culture of inquiry throughout the teaching team is crucial to its success as a strategy for professional learning (e.g., Groundwater-Smith & Dadds, 2004) and that the centre leadership must support the research and actively participate in it (Timperley et al., 2007).

Taking these factors into consideration, centres approached to form the contexts for the study were those that enacted a policy to employ qualified teachers, had an established prior relationship with me in my university role, were judged as having a commitment to enhancing children's experiences and learning, that focussed their curriculum and pedagogy on children's interests, and had supportive management. Cognisant that mainstream services in NZ cover a diverse range of philosophies and approaches, maximal variation was attempted. Flick (2006) describes this as research that integrates only a few cases, but maximises the differences between these cases as much as possible to disclose diversity in the field. Therefore, in the present study, two different service types were chosen as case studies: a public kindergarten sessional (half-day) service for young children (three to five-year-olds) and a private full-day service for six month-five year-olds. Further, to the best of my knowledge, this is the first study in NZ to mix service types in shared inquiry sessions; other studies have involved public kindergartens only (e.g., Duncan, 2005; Hampton, 2000; Mitchell, 2003).

The centres

Both centres approached in the first instance agreed to participate in the study. These were located in Takapuna, North Shore City, within two kilometres of each other, in part drawing children from similar geographic and socio-economic areas, thereby retaining an emphasis on diversity of service type rather than families. Many of the teachers, but not all, were previously known to me through my university role.

The No. 1 Kindy

The No. 1 Kindy Limited (1K) was a privately-owned full-day fee paying service for children aged from six months to five years. Located in a renovated villa, teachers valued a home-like atmosphere and philosophy. The centre drew its attending children mostly from a five kilometre radius. However, some families travelled from further afield to attend; such was the reputation of the centre. The local community comprised largely upper-middle income earners. Licensed for 34 children, 12 under two and 22 over two, it employed six teachers each day (three were part-time), that is, seven teachers in total. Of the seven teachers, four were qualified and provisionally registered teachers, two others were completing study currently, and the other (and the owner also) had a mix of credentials but not a full teaching qualification. In terms of privately-owned centres, this proportion of qualified and in-teacher-education staff is high (Mitchell, 2002) and therefore met the intended characteristics of the sample for the study.

Teachers operated a roster and some remained solely responsible for the infants and toddlers aged less than two years each day. The roster was for policy and funding reasons and not related to centre philosophy or practice, as children were able to move freely around the centre for long periods of the day. There was also frequent collegiality, movement and communication among the teaching team each day. At the time of the research, the roll was made up largely of Pakeha/European children. The majority of children lived in two-parent families. There were 55 children on the roll at the start of the research period as many attended part-time. At the beginning of the fieldwork, there were 28 children on the Friday roll (the day I attended); this fluctuated throughout the year between 16 and 28.

A child-initiated, play-based curriculum was offered for the majority of the time. An outdoor play environment with a large sandpit, swings, rubber matting for running and riding bikes on and climbing apparatus was available to children. This area was supplemented by teachers' provision of additional equipment to support children's interests and learning. Water was available on most warm and sunny days, often as requested by children. Paint, collage, writing and drawing materials were also available outside in the converted garage, known as the "art room", every day. Between the art room and the house was an area known as the "atrium". This covered

area was used flexibly to set up activities responsive to current interests, for example, a dolls' house or an office or an alternative family play area.

The indoor environment was divided into four main areas, plus the kitchen. While these were used flexibly, often to set up experiences responsive to children's interests, the four areas were usually an area for family, books, music and block play; an infant area with manipulatives, books, a small slide and other similar equipment; the arrival area where children's bags were kept (and off this the infant sleep room); and the dining area which was also used to set up manipulatives or a train set and the like. Children moved freely between these areas once all teachers were present for the day. Children's play was punctuated by routines such as mat time and meal times which children shared together as small or large groups. These provided opportunities for much informal conversation initiated by children about their activities and interests. Children could also request food and water throughout the day and frequently investigated what the centre cook was preparing in the kitchen.

1K had a strong philosophy and practice centred on warm and responsive relationships with children and families. A focus for 2005 was to provide stronger links between their knowledge of children and their curriculum planning based on children's interests. Curriculum planning and evaluation meetings were held fortnightly, but assessment of children was piecemeal and unsystematic and, despite good intentions, teachers had been finding their processes unsatisfactory. At the beginning of the study, curriculum documentation consisted of "baby diaries" for the under two year olds, with dated entries (approximately 2-3 each week for full-time attendees) often accompanied by photographs that encompassed a wide range of development and learning, and encouraged input from parents. For the over two year olds, individual assessment portfolios containing learning stories (the narrative assessment model designed to implement *Te Whāriki* by M. Carr, [2001a]), curriculum artefacts and comments from parents were kept. For a few months during the study, each teacher took responsibility for the portfolios of up to seven children. However, this system did not improve the quantity or quality of assessment documentation for a number of reasons, including those explicated later. In addition, a folder of planning and evaluation material for the under twos and wall displays of programme planning for the over twos were collated and stored.

Takapuna Kindergarten

Takapuna Kindergarten (TK) is a sessional public kindergarten, managed by the Auckland Kindergarten Association, drawing children from the local area. The government partially funds this service, with the balance met by parent donations and fundraising. Public kindergartens employ fully-qualified teachers and traditionally provide half-day (sessional) programmes for three and four-year-olds. The role of the teacher is seen as supporting or guiding children's learning in a richly-resourced environment. Kindergartens usually enjoy significant parent support and input. TK valued regular excursions as part of children's curriculum experiences and parent support was vital to these. Parent help during sessions was infrequent, partly because the kindergarten often had student teachers on practicum in attendance as extra adults, so teachers did not overtly request help.

TK employed three teachers for the 45 four-year-old children on the roll for the four-hour long Monday morning sessions I attended. The local community comprised largely upper-middle income earners. At the time of the research, the roll was made up largely of Pakeha/European children. The following ethnicities were also represented: South African, Māori, Korean, Chinese, Japanese and Russian. The majority of children lived in two-parent families.

Similarly to 1K, a child-initiated, play-based curriculum was offered for the majority of the session time. An extensive outdoor play environment with a large sandpit, swings and climbing apparatus was available to children. This area was supplemented by teachers' provision of additional equipment to support a focus on children's physical skill development. Paint, collage, drawing and carpentry were also available outside every day and water on most days. The indoor environment was also large, open-plan and well-equipped. Painting, collage, drawing and writing materials, dramatic and family play equipment, blocks, construction materials such as Mobilo, mathematics games, puzzles and books were all displayed at the children's level for them to choose from. Children selected their own resources and materials and used nearby tables and chairs as required. Crackers, fruit and water were available throughout the session. Children accessed this as they wished, so that their interests and concentration were not interrupted. Whole group mat times occurred in the middle and at the end of each session, and were used to develop children's

understanding of kindergarten events and projects, and their speaking, listening and questioning skills. The philosophy, practice and pedagogical interactions were supportive of a focus on children's interests.

Curriculum planning and evaluation occurred on a weekly cycle. Three focus children for each teacher for each sessional group were identified, usually following alphabetical order on the kindergarten attendance roll. The teachers undertook observations of these children over the week of focus, using their current assessment portfolio (including learning stories, photographs and other artefacts, and brief notes from parents at the back of the portfolio) as background information on each child's progress and interests. At the next meeting, teachers presented information about these children to assess them in relation to dispositions linked to *Te Whāriki*. From this, individual goals and plans were developed. These were incorporated into a group plan that integrated *Te Whāriki's* strands and goals. Therefore, individual attention to each child occurred approximately three times during a year, but documentation of ongoing learning also occurred throughout the year to inform this focused planning.

In addition, for the four-year-old children attending the morning session, self-assessment of their interests and abilities occurred through teacher-child dialogue. Individualised attention to these occurred through co-construction of a related step forward in experience and learning, known as "challenges" (see p. 168). Acting on these individual foci was a strong aspect of the curriculum. Alongside these individual and group plans, but not always directly connected to either plan, a number of teacher-initiated projects took place during the year. These projects represented teacher interests (e.g., relocating the garden so that vegetables and herbs could be used in cooking) or annual events (e.g., children learning dances for the annual disco). Current planning information coupled with documentation of spontaneous and/or significant experiences was displayed on the walls and on a board where children and parents signed in each session. Documentation of the group plans and projects took the form of large planning folders that were regularly updated and on display in the reception area.

The participants

Children, teachers and parents participated in the study. Detail of the number in each centre is now described, along with an introduction to the teachers and full child participants.

The teachers

There were 10 teacher participants in the study. The three teachers at TK all participated and the six teachers at 1K who were present on Fridays participated. The centre owner frequently filled a teaching role to support staff at busy times and attended the group inquiry sessions, therefore is also referred to as a teacher in the study.

Angela had completed her Diploma in Teaching (ECE) two years previously and had seven years of experience in early childhood education, most of this time at 1K. She identified her main interests as animals and walking for exercise, and got married during the course of the year. Barbara had a two-year family day care certificate, had completed secondary education to form six, nominating Biology, Art and English as specific subjects, had spent seven years in Playcentre with her own two children (but not gained Playcentre qualifications beyond introductory level), and had 10 years experience in privately-owned early education and care centres, the last seven of which were at 1K. Barbara's family occupied much of her leisure time and she identified walking, gardening and photography as personal interests.

Claire was a recent degree graduate who had undertaken her early childhood qualifications straight from secondary school, completing a foundation course first. She had been teaching for one year at the beginning of the study, eight months at 1K. Claire's main interests were sports-related, such as snowboarding and kayaking. Claire left 1K to travel overseas just prior to the completion of fieldwork. Like Claire, Kylie had staircased through early childhood qualifications, but with three different providers, and had recently completed a degree. She had worked in the field for 10 years in various services, the last three-and-a-half at 1K. Her nominated interests were walking, gardening, socialising and te reo Māori (Māori language). Vicky had also staircased through some qualifications and was currently completing degree study. She had been involved in early childhood for 10 years, both in

Auckland and London, the last two at 1K. Her main interest in 2005 was organising her wedding, which occurred towards the end of the year.

Ruth had a degree in Education and Psychology and had amassed "points" of early childhood study, but not obtained a coherent qualification, which she regretted. (Licensing "points" were an intermediary step to licence centres in the 1990s that gradually increased supervisory qualification levels in NZ early childhood centres. Barbara's family day care certificate had also attracted licensing points at an earlier stage.) The parent of two primary school aged children, her main interests revolved around supporting them and their schooling, supplemented by interests in music and movies. Wendy held a Diploma in Teaching (ECE) earned 15 years previously, had secondary qualifications in a range of subjects and had studied some papers towards a degree. She had been teaching for 15 years in a range of services, including time in London as a nanny and nursery teacher. She had been at 1K for almost two years, but this included a period of six months' maternity leave. Her new first-born daughter was her main interest, for example, taking her to music classes and socialising with friends with babies.

TK had three qualified teachers. Christine had qualified with a Diploma in Teaching (ECE) straight from secondary school, and in the last 10 years completed a Diploma in Early Intervention and a Higher Diploma in Teaching. She had also completed some papers towards a degree. She had been teaching for 23 years in a range of services in NZ, UK and Europe, with the last five being head teacher at TK. She had a wide range of interests in the areas of being physically fit and active and both participating in and appreciating the Arts. Louise had completed a degree in early childhood teaching, and had secondary qualifications in a range of subjects, including Māori which she identified as an ongoing interest. She had been teaching for five years, with one thus far at TK. She was part of a large extended family, enjoying the commitments involved in this, and had a range of outdoors and fitness-related interests. Theresia had completed a degree in early childhood education as a mature student, having previously worked as a laboratory technician after achieving secondary qualifications in science. Parenting three children, who were now adults, had led her into a second career in early childhood education. Her personal interests

involved family and community activities, alongside creative endeavours such as gardening and handcrafts.

The children and their families

All parents whose children attended on the day of my participant observation received information about the research. Getting to know parents, in order to approach them personally, and then obtain consent from children to participate proved slightly problematic due to my once-weekly attendance. The teachers in both settings eventually acted as mediators for me and followed up with parents who had shown an interest either in the research or in my presence. Of the 45 children at TK, permission to approach 17 was obtained from parents. All 17 were then involved in the study, five as full participants who took part in interviews with one of their parents, (a later section on interviews explains how these children were chosen), and the rest were centre-only participants. One of the 17 clearly indicated dissent and was only a peripheral part of the study. The number of children in the study at TK decreased over the year as children left to attend primary school on their fifth birthday, until there were only three left in December. Of the 26 children at 1K on Fridays at the beginning of the year, permission to involve 18 children was gained, six of whom took part in interviews. One infant indicated dissent. I did not pursue the relationship and the parents subsequently withdrew consent after discussion with me. While some children left 1K during the year to go to school or through a family move, there were still ten participants in December. The number of children interviewed in family homes was negotiated with my thesis supervisors as 10-12; 11 were interviewed. The following descriptions introduce the children who participated in interviews from oldest to youngest. Those attending 1K are introduced first, followed by those at TK.

Lucy was almost five and the elder of two siblings who spent shared time with each parent in two homes. She attended 1K full-time, that is, approximately 40 hours per week. Lucy's strong interests at 1K were in literacy, dancing and music and she also enjoyed playing with the babies at the centre and helping the teachers to care for them. The home interview revealed that her interest in literacy was also recognised and supported. She also enjoyed playing "Mums and Dads" with her friends and dolls in an outside playhouse in particular, spending time with grandparents, dancing and singing, riding bikes, watching videos and DVDs to support her dancing and singing,

and art and craft related activities. Lucy and her family were friends with two other families who also attended 1K and participated in the study. Lucy, Olivia and Meg attended a dance class together as well as socialising as families.

Olivia was also the elder of two siblings in a two-parent home. She spent some time at public kindergarten and some at 1K (Fridays and occasional afternoons). After beginning primary school in May, Olivia and Lucy also attended 1K during the school holidays in 2005. Olivia enjoyed a range of 1K experiences; however, she was commonly found in either art and/or literacy activities or "cooking" in the sandpit. She always played with others and liked to lead groups. At home, she also enjoyed cooking and baking, and helping out with other tasks, including her mother's paid work from home, playing "Mums and Dads" with her friends and dolls, and loved spending time with her grandparents.

Meg was the younger sibling in a two-child, one-parent home. Another 1K full-timer until attending school in May, she participated enthusiastically in all activities, events and experiences, but particularly enjoyed physically active outdoor play, art, dancing, music and literacy activities, playing with dolls to represent family experiences, and helping teachers at meal times. At home, she also enjoyed dancing, music and literacy activities, playing "Mums and Dads" with her sister and dolls, watching videos and DVDs, and enjoyed swimming, both at home in the family pool and at the beach.

Jack was the elder of two siblings in a two-parent home; his brother was born just prior to the home interview. Jack attended 1K part-time (one-three days per week); his main interests at 1K were the swings, manipulative materials that he could inquire into the mechanics of, favourite books and music, and doing anything a special friend wanted to do. At home, Jack was an intent, engrossed participant in his parents' domestic and interests-related activities such as renovating a boat, swimming and meal preparation, and also enjoyed literacy activities, time with grandparents and trips to places such as the zoo. When he transitioned to TK during June-July that year, he was immediately attracted to the carpentry, water and art activities. He was less confident in his exploration and learning at TK until a special friend began attending too.

Imogen (also known as Immy) was Olivia's younger sister and attended 1K full-time apart from a short period in the middle of the year. At 1K, Imogen was an active participant and inquirer in every experience happening, often with a keen eye or ear for something new being offered and making sure she was involved. In particular, she enjoyed outdoor play with other children (sand, water, bikes, and swings), art and books, playing with dolls, music and movement, finding worms, butterflies and slugs, and interacting with adults and other children, but especially her friend, Billie. At home, Imogen also enjoyed physically active experiences, playing with dolls, helping to cook and bake, watching favourite videos and playing with neighbours and friends.

Billie was Lucy's younger sister and, at age 22 months at the time of the interview, the youngest involved in that method. Billie had attended 1K full-time since the age of one. She enjoyed the security and stability of 1K and found the constant presence of her special bear, Da, important to settling in each day. At 1K, she enjoyed books, art, music and movement, playing with dolls, swings, sand and water play, and other children's and adults' shoes. While Imogen looked out for her at the centre and involved her in many things, including trying to ensure they sat together at meal times, she herself was quite self-sufficient and often chose to play on her own. At home, she also enjoyed books and reading, often sitting in a small tent in the children's play room reading to herself. She also enjoyed dancing and singing, going shopping and socialising with her Mum, wearing other people's shoes and playing with her doll, generally feeding and caring for it.

Introducing the children at TK, Tom was the younger of two siblings in a two-parent home and turned five in September. He enjoyed outdoor, physically active play, with one of his highlights that year becoming a "mountain climber" through creating and achieving a rope climb. He also enjoyed manipulatives (blocks, carpentry and Mobilo), both on his own and with others, and was very creative with constructions. He often persisted with several designs over a period of time to achieve what he wanted from models and constructions. He enjoyed playing with several friends, particularly re-enacting scenes from popular culture with their Mobilo models. At home, Tom enjoyed construction equipment and manipulatives too, and going swimming, riding bikes, playing games and dress-ups with his sister, along with

spending regular time with grandparents. Tom attended another centre one afternoon a week.

Ben was also the younger of two siblings in a two-parent home, and one of Tom's friends at TK. He enjoyed manipulatives and construction activities, but was often in the sandpit when outside, as well as enjoying physically active experiences such as the monkey bars and cargo net. He rarely played alone, preferring the company of other boys. He initiated a year-long cape making project in the kindergarten that continued at the kindergarten after he went to school in October. At home, his interests were quite different. He enjoyed riding bikes, particularly with his sister and neighbourhood children, playing with the family cat, playing on the computer and watching television and videos. He liked to help his father with household tasks and spend time with his grandparents.

Caitlin was another who was the younger of two siblings in a two-parent home. Her greatest interest at TK and at home was relationships and interactions with people. At TK, she enjoyed art and literacy activities and playing in the family corner. She also enjoyed being outside with her special friends, Gina and Harry, often cooking in the sandpit or on the swings or monkey bars, and inside playing together in the family corner. Their families also socialised outside kindergarten. At home, she enjoyed cooking and baking, playing with dolls, swimming and a number of activities stimulated by her older brother such as spelling, puzzles, Lego, Playstation and computer games. Caitlin's parents owned and managed a company so she also spent time with a nanny and her grandparents, including after beginning school in November.

Greta and Leah were twins with no other siblings in a two-parent home, who spent time with grandparents while their parents were at work. They were self-sufficient in their play, and repeated interests across the centre and home settings were evident. They engaged constantly in socio-dramatic play with animals as props, enjoyed art activities and reading books. They often spent weekends at a family beach house, enjoying swimming and collecting shells and feathers to use in creative arts. They turned five in November.

Other children who were participants are named in the following summary table of all participants:

Table 5.1: The study's participants

IK = The No. 1 Kindy *TK* = Takapuna Kindergarten

<i>Teachers IK</i>	<i>Teachers TK</i>	<i>Full participant children IK</i>	<i>Full participant children TK</i>	<i>Other child participants</i>
Angela Barbara Claire Kylie Ruth Vicky Wendy	Christine Louise Theresia	Lucy and Billie (siblings) Olivia and Imogen (Immy) (siblings) Meg Jack (to August)	Ben Caitlin Tom Greta and Leah (twins) Jack (from August)	Gianni, Luca and Marcella (siblings), Jansen and Finn (siblings), Isabel and Ronan (siblings), Danyela, Amelia, Safiya, Jayde and Aidan (1K) Gina, Harry, Zach, Alex, Trent, Bella, Shannon, Qing Qing, Valerie, Elliot and Maya (TK)

Methods

A two-phase approach

The present study proceeded in four stages, including two fieldwork phases. These are summarised in figure 5.1:

Prior to study (2004 – January 2005)	<ul style="list-style-type: none"> ➤ Literature reviewed and focus of study's topic and methodology established ➤ Ethical approval for study obtained from MUHEC (04/64) ➤ Permission gained from kindergarten association ethics committee to approach Takapuna Kindergarten for the study and owner of The No. 1 Kindy to approach teachers ➤ Meetings with teachers to explain study and invite participation
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Phase one January – June 2005	<ul style="list-style-type: none"> ➤ Participant-observation in centres, initially to build relationships and knowledge of setting, later to observe and participate in interests and inquiries of children and learning and teaching interactions ➤ Participation invited of children and parents; informed consent gained ➤ Individual interviews with teachers ➤ Teaching team interviews ➤ Curriculum planning and evaluation meetings attended ➤ Fieldnotes and analytic memos written, photographs taken and either photographs or copies of curriculum documentation obtained
Phase two July – December 2005	<ul style="list-style-type: none"> ➤ Participant observation continued ➤ Fieldnotes, analytic memos, photographs and either photographs of or copies of curriculum documentation continued ➤ Co-constructed facilitated inquiry sessions using phase one data and research literature with teaching teams – six meetings occurred on a monthly basis
After study (2006-2007)	<ul style="list-style-type: none"> ➤ Data analysis, interpretation and report writing ➤ Summaries of data analysis/interpretations sent to teachers, followed by a meeting to discuss findings and interpretation ➤ Summary of study sent to parents and children

Figure 5.1 – Summary of research design and procedures

Phase one

During phase one, I spent time in each centre to establish sound relationships and get to know the realities of each setting. This emphasis on relationships has been established in previous studies as contributing to the quality of the data and subsequent findings (Anning & A. Edwards, 1999). This phase incorporated both "descriptive observation", or orientation to the settings to observe generally what is happening, and "focused observation", in which observation narrows in on the phenomena most essential and relevant to the research questions (Spradley, 1980, cited in Flick, 2006). In addition, individual teacher and teaching team interviews and interviews with children and families occurred.

Where previous studies have employed action research (e.g., Anning & A. Edwards, 1999; Jordan, 2003) or provided a programme to introduce new sociocultural concepts (e.g., S. Edwards, 2006), an explicit aim of the present study's design was for me, as the researcher, to spend significant time in each case study context, in order to understand the philosophy and practices of each setting and to generate data for my own study that could also be examined by the teachers. Such an examination provided them with a new perspective on their work and enabled them to give input and direction to the second phase of the study. I was constantly aware of my definition of a critical friend; that although I was trusted to provoke thinking through my data, I also needed to be sensitive to supporting their work. By spending time in each centre before introducing reflective inquiry and dialogue that included a theoretical component, I showed that I genuinely valued the expertise that the teachers had, and co-constructed a community of inquiry with them in the way that Cullen (2004) highlights as sharing knowledge with mutual respect.

A co-constructive philosophy ... leads participants to view their contributions collaboratively rather than through an expert lens, in which one form of knowledge, the expert's, is privileged over another. This is not to say that specialist or educational expertise is not valued, but rather that it may take new forms and meanings when multiple perspectives are shared and contribute to decision-making (Cullen, 2004, p. 79).

Phase two

During phase two of the study, I continued as a participant-observer in each setting. In addition, the teaching teams met together on six occasions at monthly intervals for shared inquiry and discussion. Bringing the two teams together was designed to enable mutual sharing and interdependence to grow through evidence-informed, progressive dialogue and inquiry. At this point, while context was important, the differing orientations and dispositions of teachers because of context might be balanced out, and critical comments thought about carefully because of the multiple perspectives offered (Orland-Barak & Tillema, 2006). Teachers were change agents in their own settings to act on results of their inquiry.

My role as critical friend in the present study was then two-fold. Firstly, my weekly presence in each centre raised consciousness about the focus of the research and

encouraged teacher thinking and action, sometimes, but not always, prompted by fieldnotes or informal dialogue with me. Secondly, once a collaborative relationship was established, and more directly attributable to my methods, the phase two inquiry sessions challenged some practices, supported teachers to build knowledge of contemporary sociocultural understandings of theory and research, and anticipated that once this information was added that understanding and action occurred. This approach is reflective of the elements of a spiral of knowing, and also consistent with Guskey's (2002) model of teacher change, that is, that teachers require evidence for themselves of any necessity to change practices or alter taken-for-granted practices and improve outcomes for children; they do not engage in change simply because an "outsider" suggests it.

Data generation techniques

The following strategies were used in the present study to obtain rich data. These informed the subsequent analysis, findings and interpretation of the study.

Participant observation

I attended TK on a Monday morning each week from 8am-1pm for the four hour session with four-year-old children, plus an additional half-hour prior to and after each session. As kindergartens follow school terms and holidays, there were regular breaks in my attendance. I attended 1K on a Friday morning from 8am-12pm; the centre having opened at 7.30am and most children eating lunch, resting or sleeping by 12pm. One week in November I swapped days to attend the weekly gymnastics class with children from 1K on a Monday and attend Caitlin's farewell from TK on a Friday. In total, 164 hours of participant observation occurred at 1K and 165 hours at TK.

During phase one the purpose of participant observation in each centre was descriptive observation (Flick, 2006); to get to know the setting and understand some of the realities and constraints of teaching practice of participants. Later, this involved participation in teaching and learning interactions that arise from children's interests, documenting children's interests and inquiry during pedagogical interactions with teachers and peers, attending curriculum planning and evaluation meetings with each team of teachers and collecting samples of curriculum documentation.

The first month of participant observation initially allowed for a more peripheral observation of each centre's activities before becoming involved with children and teachers. I adopted the approach of Corsaro (1985) who, in a seminal study of young children's friendship patterns, spent a year participant observing in a nursery school setting in the USA. That is, I did not act with children in ways Corsaro describes as typical of adults by initiating interactions or standing above them for example. Instead, I commonly positioned myself for reasonably lengthy periods of time at children's level of activity and waited for them to initiate conversation. Once a few key relationships with children were established in each centre, I quickly became accepted by most of them, commonly being viewed as a resource and/or extra playmate.

My participant-observations were, at times, of individual children interacting with cultural tools in the play environment; but more frequently, "interactive episodes" (Corsaro, 1985, p. 22) between child peers and teachers and children. Fieldnotes recorded evidence of children's interests and inquiries and ways in which children's interests were enacted, recognised and engaged with by teachers. Apart from one occasion when I tracked Aidan for the entire morning, what was participated in and recorded depended on where I happened to be positioned at the time. In the main, I chose to be where a large group of children and teachers were; but, increasingly over the year, I responded to children's requests to participate with them. On occasion, I would position myself to observe new activities teachers introduced, planned for children's interests.

The vital point of Graue and D. Walsh's (1998) about the role of the researcher as a data generation agent through relationships with participants is again highlighted. There were multiple activities occurring simultaneously within my range of vision, but I was participating in and recording only one of these at a time, with occasional general notes of what was happening elsewhere. My primary focus on children during the participant observation of phase one occurred because, in a study focusing on children's interests, I needed "to gain insight into *what mattered most to them*" (Corsaro, 1985, p. 28, italics in original). During phase one, I also moved towards focused observation (Flick, 2006) to concentrate on aspects most relevant to the research questions and generate data primarily with full research participants. By this

time, children had established relationships with me and had expectations of my interactions with them so that undertaking focused, lengthy, observation in relation to these children was easily facilitated.

During phase two of the study, I continued focused participant observation. After informal data analysis of patterns and themes in behaviours, I included selective observation (Flick, 2006), intending to find further examples and evidence of the types of practices and processes that supported and/or challenged the data of phase one, based on teachers' engagement in the collaborative inquiry processes of phase two. For example, one morning at TK was spent observing the family corner for evidence of teachers' understandings and interactions related to children's funds of knowledge established during the home interviews.

Fieldnotes

Fieldnotes are written impressions and notes of observations. Neuman (2006) advises that these be as "concrete, complete and comprehensible" (p. 400) as possible, record exact dialogue and include small talk and comments as they may become important during the analysis. Fieldnotes for each centre separately were jotted in notebooks and recorded later each day onto word-processor files. Verbatim extracts of fieldnotes from each setting are in appendix 6. Here, the selective nature of data generation is apparent, with data reflecting my positioning and relationships as well as chance happenings. At one point, I reflected and wondered, given there were so many other things happening at the same time, including in places elsewhere in the centre, how I could be certain I was capturing the most relevant data. Nevertheless, over time, themes and patterns that were recurring pointed to useful data that could be analysed. Further, my informal analyses were in concurrence with the teachers, whose greater experience of the setting and knowledge of the children supported my thinking.

Fieldnotes were coupled with analytic comments or separate analytic memos (see appendix 7), discussing thoughts and ideas that emerged, to link the data with theoretical ideas and possibilities for analysis (Neuman, 2006). During this phase some initial informal coding of fieldnotes occurred. Open coding allows a researcher to identify and perhaps extract themes, topics or issues in a systematic manner. At

this stage, I looked for evidence of children's interests, patterns of teacher recognition and responses, evidence of shared understandings, and teachers' professional knowledge. This initial categorising was useful for supporting the teacher inquiry of phase two.

Photographs

Photographs allow detailed recording of occurrences that may be too quick or complex for the human eye to capture in writing (Flick, 2006). Photographs of children and teachers engaging in interests and inquiry-based experiences were taken to supplement fieldnotes and provide an easily accessible visual record of sequences of teaching and learning events and interactions. Children were accustomed to the use of photographs being part of their assessments; therefore my actions were not unusual in their daily experience. While they acted as an aid to my memory and fieldnotes, they were also used as a stimulus during child and parent interviews. Although video recordings of teaching and learning events and interactions were approved by Massey University's Human Ethics Committee, I made the decision not to use this technique so as not to alter the teaching and learning environment. Further, Clandinin and Connelly (2000) caution against over-use of both audiotape and visual recordings, suggesting that as all field texts are constructed representations of experience, researchers should trust themselves to capture field experience adequately through fieldnotes. In addition, photographs of centre documentation and displays relevant to the study were taken in accordance with negotiated protocols, as evidence of learning and teaching processes.

Interviews

A mix of formal and informal interviews occurred. Informal conversations with all participant teachers, children and many parents took place frequently during interactions in the centre. A range of formal interviews occurred that were transcribed for analysis and verified by adult participants. Individual semi-structured or episodic interviews (Flick, 2006) occurred early in the fieldwork with each teacher (appendix 8). Similarly, focused group interviews with each team of teachers took place (appendix 9).

From April to July, interviews with 11 children and their mothers took place (appendix 10), the majority in the April school holidays to suit the families. Of those who had consented to participation at TK, approaches were made for interviews in the order that consent had been received. All families approached (those of Tom, Caitlin, Ben, Leah and Greta) agreed to be interviewed. At 1K, two toddlers, Imogen and Billie, quickly established a relationship with me and became a focus of my fieldwork. They both had older siblings at the centre, Olivia and Lucy. They spent much time at the centre and at outside events with a friend, Meg, so it would have been inappropriate to exclude her from the opportunity to be interviewed. By chance, these were all girls, so I made the decision to also involve a boy to get a spread of gender and age. The first family approached, who had two boys at the centre, was unable to complete an interview in the time frame, so I approached the family of Jack, an almost three-year-old at the time of interview, as I had no other child of that age as a full participant in the study.

The purpose of the interviews with the children and families was to establish the child's interests from the child's and parent's perspectives. This acts on the belief that children can offer a valid perspective on their own learning and be active participants in research. Parents were offered the option of undertaking the interview at the centre or at home; all chose to let me visit the family home for this purpose. Unanticipated benefits of this were that many children were keen to show me their bedroom, play room or area, special toys or equipment such as bikes and/or the family computer, and that some older siblings participated in the interview. These chance events provided valuable additional insight into children's lives and interests. Analytic memos were written to supplement these interviews (see appendix 11).

Children were familiarised with the tape-recorder prior to their interviews. A person not associated with the research, who had signed a confidentiality agreement, transcribed the tapes. All participants were provided with transcripts of their interviews for verification purposes. Parents were asked to read the children's transcripts with them. Some clarification and minor corrections and changes to the teacher interview transcripts resulted from this validation process. I listened to all the tapes subsequent to this process. I was able to add in details the transcriber had been

unable to recognise, such as names, and any updated transcripts were e-mailed to the families.

Curriculum documentation

A range of curriculum documentation was kept in accordance with access protocols negotiated in each setting. Copies of samples of children's work or pictures that related to their interests were collected. In addition, evidence of teacher planning, assessment and evaluation was gathered. Some of this was in large folder or poster form and was photographed rather than photocopied. This documentation provided evidence of how teachers construct and interpret curriculum and pedagogy in relation to children's interests.

Facilitated inquiry discussions

The teachers were given the opportunity to reflect on the fieldnotes data generated. Firstly, fieldnotes were sent electronically each week to each centre, intended as a method of researcher transparency. However, unplanned and unanticipated, but in keeping with the study's intentions, these were immediately used as a tool for reflection by the teachers. Their curiosity about how I perceived them and to note what had been happening for children each day that they were not part of, and therefore frequently unaware of, began early on.

In addition, each centre was provided with a hard copy of the phase one fieldnotes to assist topic selection and evidence-informed inquiry for the phase two sessions. In the group inquiry sessions, as identified by Flick (2006), mediating the discussion, integrating the perspectives of all participants, challenging the inquiry and providing my own input was a complex task. Yet, this dynamic dialogue and the social negotiation and shared understandings that resulted were an essential element of the theoretical approaches to both methodology and curriculum and pedagogy underpinning the present study.

At the first group meeting, in forming our joint community of inquiry, time was spent firstly on the two teams of teachers getting to know one another. Secondly, topics and questions arising from the fieldnotes, related to curriculum and pedagogy built on

children's interests, that were of shared interest were discussed. The five topics agreed upon and the order they were undertaken were:

1. learning environment
2. interactions with children/listening/dialogue
3. assessment/documentation
4. planning/projects
5. teacher development/professional portfolios

I then constructed a professional learning dimension to the study. I offered relevant reading material and discussion questions on each topic linked to the research focus, for the teachers to increase the dialectic relationship between research, theory and practice (see appendix 12). Five further meetings at monthly intervals were held, with the teachers participating in research-related discussion. Frequently, the full agenda was not achieved in the two hours spent together, but I ensured key aspects of inquiry related to the aims of the study were focused on.

Data analysis and interpretation

"Truth be known, the real work of qualitative research lies in mindwork, not fieldwork" (Wolcott, 2001, p. 96). Wolcott differentiates data analysis and interpretation. He defines analysis as the examination of data using systematic procedures in order to apportion it into categories and report it. He suggests that interpretation is not derived from such rigorous procedures, but from efforts at sense making, "[I]nterpretation invites the examination, the 'pondering', of data in terms of what people make of it" (Wolcott, 2001, p. 31). Interpretation must always remain somewhat uncertain and open-ended (Ezzy, 2002). In the present study, a descriptive analysis occurred first, followed by a theoretical analysis of the data to aid its interpretation and structure the written report.

Data analysis procedures

Qualitative data analysis requires overlapping processes of "defining, categorising, theorising, explaining, exploring and mapping the data" (Ritchie & Spencer, 2002, p. 305). Hollway and Jefferson (2000) draw attention to the problems and limitations of using qualitative analytic software tools from both theoretical and methodological perspectives, suggesting that analysis can become fragmented and that without an

holistic overview, important connections between data may be overlooked. Holistic qualitative analytic techniques were applied in the present study. As in the research process, the researcher was the main data analysis agent.

During phase one, as noted earlier, informal global data analysis (Flick, 2006) occurred as conversations with the teacher participants occurred and teachers reviewed the phase one fieldnotes in order to identify topics for the phase two inquiry sessions. Key words and repeated episodes for individuals and groups of children were highlighted in the fieldnotes and documentation as a form of open coding to begin to notice themes and patterns. Further, throughout the study, small analytic notes were added to fieldnotes to identify hunches, emerging questions and matters to follow up. In addition, analytic memos were written to expand on some of these and also to aid researcher memory for the follow-up writing phase (see appendix 7). At the conclusion of the fieldwork, all data were assembled in hard copy apart from photographs.

Step one: Descriptive analysis

As recommended by Pollard (1996), systematic descriptive analysis occurred first, in order to inform the theoretical interpretation. As a first step, it was important to deal with the sheer volume of data, data reduction being an issue common to many qualitative studies (Neuman, 2006). The four research questions were used to guide a descriptive analysis and data selection through continuous reading and re-reading of the data in a constant comparative technique (Miles & Huberman, 1994), followed by coding of the data according to repeated ideas and topics. For example, I analysed the fieldnotes for evidence of teachers' recognition of children's interests and how these were used to build curriculum, and I analysed the group inquiry transcripts for new understandings of sociocultural theory and evidence of shifts in practice.

This recursive analysis was a complex process that incorporated some ambiguity and possible contradictions. Coming to terms with these and incorporating them in the argument in order to clarify and deepen understanding is a further goal of analysis (Huberman & Miles, 1994). Progressive focusing of categories, themes and issues related to the study's research questions occurred through the construction of summary tables. Three iterations of this data reduction and summarising occurred,

with the last iteration being shared in summary form with teachers for member checking and validity (appendix 13). Later, summaries of findings in relation to children's and teachers' funds of knowledge, working theories and spirals of knowing included in tables in chapters six and seven were also shared (see appendix 14).

In addition, because the interviews with children and their families, and the rich information that had been revealed during these, did not neatly fall into the categories within this method of analysis, I modified an approach used by Cremin and Slatter (2004) and developed a matrix for the individual children who had been interviewed to analyse their interests (see appendix 15 for an example). This clearly illuminated the nature of children's interests in the home and centre settings, and provided further evidence for the links made later to the theoretical framework chosen to explain the study's findings, funds of knowledge.

Subsequently, I returned to the data to consider research question two about whose and which interests will be engaged with in building a sociocultural curriculum. For this analysis, I considered sociocultural aspects of the learning and teaching processes promoted in *Te Whāriki*, such as dispositions, working theories, collaborative learning and shared meaning making, in the pedagogical interactions recorded in the fieldnotes. As noted in chapter two, a wider perspective on dispositions besides those promoted in Carr (2001a) were included, for example, dispositions to think mathematically or scientifically as evident in children's knowledge building efforts, or to be a leader or collaborator in teaching-and-learning experiences. Further criteria were applied to determine that these dispositions and other aspects represented a sociocultural, rather than cognitive-constructivist, perspective. The criteria were derived from the discussion of sociocultural theory in the literature review. These were that knowledge building and learning occurred in the context of engagement in learning-and-teaching that involved two or more of the following:

- reciprocal and responsive relationships
- evidence of intent participation
- collaboration, co-construction and/or co-creation of knowledge
- intersubjectivity
- distributed cognition

- revisiting, challenging and/or extending previous learning (support from curriculum documentation and/or family interviews triangulated this)
- self-motivated inquiry (curiosity) being pursued either with or in spite of peers
- dialogue as central to the learning and knowledge progression
- the involvement of cultural tools, activities and/or events

Step two: Theoretical interpretation

The descriptive analysis linked to the research questions led to identification of repeated key ideas to inform a theoretical analysis. This interpretation of the data was consistent with the aims of the study, its research questions and theoretical perspectives. Two sets of theoretical constructs consistent with sociocultural theory are provided to explain the study's findings: firstly, funds of knowledge experienced in pedagogical relationships; and secondly, key notions from a community of inquiry; a spiral of knowing, with the concept of working theories subsumed in this metaphor, and dialogue on co-constructed pedagogical relationships. These constructs were then highlighted in the analysis presented in the next chapter.

Further, consideration of the overarching research question alongside these analyses, and their potential to illuminate children's inquiry at a deeper level, also inspired reflection on both the descriptive and theoretical analyses. This led to my interpretation from an adult perspective of children's fundamental inquiry interests, posed as children's likely "real questions" (Wells, 1999, p. 91), followed by inquiry continua and a model for sociocultural curriculum and pedagogy, proposed in chapter eight. This process, like the descriptive analysis, was grounded in the data from the study, but involved multiple, cumulative layers of interpretation.

Thus, the examples in the findings and discussion chapters are representative of children's everyday play and teacher decision-making in relation to children's interests. The unit of analysis presented in tables in the findings chapters involves individuals in interactive episodes in pedagogical relationships in social contexts with mediating tools and artefacts.

A table of the data sources and alpha-numeric codes used in the findings chapters is provided so that these are identifiable in the discussions that follow. Data from both centres is presented concurrently rather than separately to highlight the key concepts of the study and illustrate the shared nature of inquiry across contexts.

Table 5.2 Data sources and alpha-numeric codes

1. Individual teacher interview transcripts	TI/p. #
2. Teaching team interview transcripts	TT/1K/p. # and TT/TK/p. #
3. Children and family interview transcripts	CFI/p. #
4. The No 1 Kindy fieldnotes	1K/p. #
5. Takapuna Kindergarten fieldnotes	TK/p. #
6. Joint teams community of inquiry transcripts	COI/p. #

In short, an iterative process spiralled between data generation, analysis, theory and interpretation of findings, consistent with the metaphor of a spiral of knowing in a community of inquiry.

The researcher is never finished exploring, searching, examining and theorizing. New depths, complexities, subtleties and uncertainties are continually uncovered. At some point the researcher must stop exploring and write, fixing her or his interpretations in ink with all the inherent political implications (Ezzy, 2002, p. 23).

Funds of knowledge

Four events alerted me to the potential of funds of knowledge as a theoretical framework, to support that of a community of inquiry, to explain children's interests and inquiries, which of these were recognised by teachers, why some were utilised to build and extend the curriculum, and perhaps why others were not. These are described, as they make explicit how a key argument of this thesis developed.

Teachers' relationships with children and families

Without exception, all teachers emphasised that in order to know children's interests, the most important category of professional knowledge was knowledge of children and families, coupled with a willingness to spend time building those relationships. All teachers saw it as their professional responsibility to interact with all children and

families. Teacher knowledge of children and families was demonstrated frequently in various ways. Here is one example from 1K:

Kylie is sitting with the children and eats morning tea with them. . . . Kylie reinforces the turn taking of conversations and supports children to listen to each other. She asks Amelia where she has been on holiday. Amelia responds "the beach" then adds "with mum, dad and [brother's name]." . . . When Kylie tells Imogen it is her turn, she says she has been at [Amelia's brother's name's] house. Amelia says that she hasn't, Kylie helps Imogen to explain that [this boy] is a school friend of Olivia's, not the [name] that is Amelia's baby brother. (1K/141)

While the teachers' commitment to children and families, and their knowledge of them, was clear in such data, my experience of spending an hour in family homes had made me realise there was the possibility of knowing children and families in a deeper way that may add relevance, understanding and meaning to children's learning.

Interviews in family homes

My interviews in family homes with parents and children gave me the opportunity to observe affectionate, spontaneous interactions between parents and children, and find out about the depth and extent of experiences and funds of knowledge that had impacted on children's interests. While both centres had warm and positive relationships with parents and attempted in various ways to involve them in their children's education, these interviews revealed a different type and level of information about the child's relationships with others that they learned from, and social and cultural experiences that teachers had not yet fully tapped into.

Teachers' interest in concept in phase two

During the group inquiry session on relationships with children, I utilised a reading examining an interaction with my niece (Hedges, 2004a), that explained various aspects of sociocultural theory, including introducing the notion of funds of knowledge. Teachers immediately and enthusiastically identified with the concept. This became the third indicator that the concept was important to emphasise in the findings.

Ruth and Angela made the connection with Jack's knowledge during discussion, but also recognised there might be more to know about children and families that was difficult to access. In the final group inquiry session, Christine revealed thoughts that had not previously been shared in the study. These further indicated the notion of funds of knowledge would be relevant to explore.

Christine - But that's their home life though, because children's experiences are based on the way they're parented ... they don't have a knowledge of marine biology just like that, they have a knowledge of marine biology because some member of their family has either that knowledge that's been passed on. ... if I have a child who comes from a family of say engineers for example or a father who has a workshop sure as anything a little boy is tinkering along beside his dad in the workshop. He has an extended knowledge of that area, but in another area he won't have that sort of knowledge. If he has grandparents who have a beach house and a boat, he knows about water skiing on a biscuit and he has the knowledge, he has the power, that's what we have learnt and want to utilise in our kindergarten. ... I'll work with a child and I'll pick up something in particular and I'll go back to the parent and say, I want to know about the genes in your family. Who's the engineer in your family? Who has the workshop? Who is the athlete in your family? It's all there and again it's building relationships with parents but there are always links there. Children don't just come into our kindergarten with that information, there's a direct link. (COI/140)

Categorising popular culture

The fourth indicator of the potential of funds of knowledge related to children's interest in popular culture. Without doubt, references to popular culture outnumbered any other coding of the fieldnotes data. At first, during descriptive data analysis, I simply categorised popular culture as one of children's interests. However, a closer examination of the data revealed that children's interest in popular culture was not often about popular culture per se, but about the actions, behaviours and values gleaned from popular culture and represented in their play, learning and relationships. This closer examination enabled me to recognise that popular culture represented something that influenced children's language, play, relationships and behaviour in quite significant ways. From a sociocultural perspective of knowledge, categorising popular culture as a fund of knowledge appeared appropriate.

Consequently, I revisited the notion of funds of knowledge, began with the existing categories from the literature and extended these to take into account additional groupings I had become aware of in the data that were consistent with a sociocultural interpretation of the concept. Later, this notion was also extended to take account of teachers' knowledge and the evidence drawn upon in their curriculum decision-making. Therefore, children's and teachers' funds of knowledge form the conceptual framework used to discuss the findings.

Summary

Consistent with the rich potential of a sociocultural approach and interpretivist methodology, data generation methods in the present study included features of ethnographic research such as year-long participant observation, teachers' and children's understandings in the form of individual and group interviews, and facilitated teacher inquiry, bringing together two teaching teams to reflect on their practices and act as change agents.

Descriptions of the data generation techniques and analysis procedures have been provided to further support this study as a "data-based, carefully executed, systematic inquiry" (Hatch, 2006, p. 405) developed through relationships between children, teachers and me as a researcher. Co-constructed inquiry investigated and illuminated curriculum constructed around children's interests and inquiries. Subsequently, these were analysed in relation to children's and teachers' funds of knowledge and key concepts of a community of inquiry. The findings of the present study are discussed in the following three chapters.

Chapter six

CHILDREN'S FUNDS OF KNOWLEDGE

Ruth - ... we say how much we know our children, we know them so well and so we think we know about their funds of knowledge but then it's so true that they have at home just so much more you can't draw on (COI/66)

Introduction

Chapters six and seven draw together the study's theoretical threads to identify ways in which children's and teachers' knowledge, interests and inquiries might be recognised, valued, engaged with, strengthened and enhanced through a focus on funds of knowledge. The focus of this chapter is on children's funds of knowledge identified in their home and community settings (research question one). Funds of knowledge were established in chapter two as a form of family capital, a term used to describe opportunities, encouragement and support provided by family members in educational activities, including informal learning. The ways teachers recognised and engaged with children's funds of knowledge-based interests and inquiries are also discussed in this chapter (research question two). In this way, the chapter addresses the first two questions of the study and also provides some insight into the third question about the professional knowledge teachers use to build a curriculum on children's interests.

Children's funds of knowledge, dispositions and working theories in pedagogical relationships

The framework for presenting the findings is the pedagogical relationships the children experienced. The chapter is structured in three sections: family-based funds of knowledge, centre-based funds of knowledge and community-based funds of knowledge. The first four categories of sources of children's funds of knowledge draw on and develop existing literature where the relationship is with parents. The next eight are derived from the data, extending González, Moll and Amanti's (2005a) and Riojas-Cortez's (2001) analysis from primarily parents to illustrate the range of people in children's lives and learning as sources of funds of knowledge. Further important family relationships and opportunities are identified, followed by other funds of knowledge opportunities gained through centre and community experiences.

In this way, my interpretation takes an extended view, consistent with sociocultural theory, to investigate funds of knowledge gained about being a member of a community and society through analysing other social and cultural experiences as sources of funds of knowledge also. As well as funds of knowledge, the learning outcomes for children promoted in *Te Whāriki*, working theories and dispositions, and examples of spirals of knowing, are noted in the analyses and discussion. The 12 categories discussed are:

Family-based funds of knowledge:

- participation with parents in household and domestic tasks
- parents' occupations
- parents' interests, talents and leisure activities
- parents' language, values and beliefs
- grandparents' occupations, leisure activities and interests
- adult relations' and family friends' interests and occupations
- siblings' and cousins' activities, interests and language
- holidays and other community experiences

Centre-based funds of knowledge:

- peers' interests and activities
- teachers' interests, language, experiences

Community-based funds of knowledge:

- cultural events
- popular culture

Arriving at a way to present findings consistent with sociocultural theory is difficult. However, by highlighting individuals within their social networks and connections, both pedagogical relationships and the shared nature of cognition are demonstrated. Data supported these categories for several children in multiple ways. For each category, excerpts chosen to illustrate findings are representative of many examples of children's everyday play observed throughout the fieldwork. This reduces the complexity of reporting the findings on one level, while still highlighting the critical role of social mediation and the confluence of multi-faceted pedagogical relationships with children's funds of knowledge-based interests and inquiries. The dynamic,

ongoing way in which children made connections between experiences, and the repetition of themes and ideas, were notable features of the data that reinforced the argument that funds of knowledge provide a critical lens with which to analyse the notion of interests.

Family-based funds of knowledge

As noted in existing literature, families are powerful primary sources of influence on children's funds of knowledge-based interests and inquiries. Marjoribanks' (2005) definition of family capital as a development of social capital theory captured two aspects: the social relationships of the family and the use of family resources in interactions and educational activities. A funds of knowledge approach to identifying interests and inquiries affirms the primacy of parents as children's first educators through children's learning through intent participation. This learning is informal because it is not necessarily designed to be educative, but draws on parents' social, physical and human capital, combining to form family capital as defined in the present study, to increase children's learning. Further pedagogical relationships within children's extended families are also evidence of family capital and opportunities for involvement in funds of knowledge, broadening the notion beyond the nuclear family. Moreover, a funds of knowledge approach exposed children's fundamental interests and inquiry into what it means to be human and live an interesting and fulfilling life. Themes of these interests and inquiries are foregrounded in this chapter and explicated in chapter eight.

Participation with parents in household and domestic tasks

Participation with parents in household and domestic tasks is an example of children's learning through intent participation, involving dispositions of curiosity, involvement and collaboration. This was one of the primary funds of knowledge identified by Moll et al. (1992), and developed by teacher researchers using the funds of knowledge methodology to better understand their pupils and incorporate topics and material relevant to their lives in their curriculum development (see González et al., 2005a). In the present study, too, it formed an important category as children learned about the responsibilities of adults and gained experience and information about their roles. Two extracts of significant data are provided, followed by findings about their recognition by teachers in the curriculum.

Table 6.1: Participation with parents in household and domestic tasks

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
<p>Olivia says she is making chocolate cake and Lucy tells me she is making cupcakes. Olivia calls out to Meg Olivia "you do this" and she sets her to stirring sand in a bowl while she starts something else in the sandpit. She tells Meg she has to be careful not to spill the mixture in case they run out and can't get any more. Lucy says they have no juice and Olivia says to check in the cupboard. As they continue playing, they talk about how you have to go to the supermarket if you run out of things. (1K/61)</p> <p>Immy is holding a Caltex carwash card and talks about going to get the car washed with Dad and then going to McDonald's. ... Barbara has set up sponges and soapy water in bowls as a carwash and invites Immy over. ... Angela asks Immy about going through the carwash - was it scary, there are big machines and loud noises. ... Barbara encourages the children to look at where the vehicles are still dirty. Immy is quite possessive over her vehicle, not really wanting others to help her, but letting them in resignation. Ruth comments on her determination to get the vehicle really clean. She tells Barbara "I want more bubbles" from time to time. Barbara now sets up a "drying room" - a separate area with towels for the children to take their vehicles over to and dry them. Immy takes hers over and dries it with the same diligence. She tells me "it's all dry – oh!" noting a spot where it is still wet and dries this off. "All done." ... She picks up another sponge and gets some bubbles from the rubber matting to clean the back of the bike again. She looks intently underneath at the sponge a few times. I ask her what she is looking at and she tells me "the bubbles. They go!" She repeats this again and then resumes cleaning and drying. (1K/148 & 150)</p>	<ul style="list-style-type: none"> • food preparation • shopping for food • adult responsibilities • vehicle maintenance • adult responsibilities 	<ul style="list-style-type: none"> • interest • involvement • leadership • collaboration • thinking scientifically • curiosity (interest and inquiry) • involvement • concentration • perseverance • collaboration • working theory re properties of sponges and bubbles • thinking scientifically

Many children enjoyed baking and cooking at home. For example, Olivia and Imogen's interest in food preparation, such as cake baking and poaching eggs for breakfast, was revealed by their mother in the home interview and represented in the excerpt above. The family enjoyed socialising with others at home and the children

participated intently in the preparation. This interest was later enacted in the centre environment with friends with shared interests, as a context to demonstrate their current understanding and collaborate in knowledge building.

In discussing whose interests create curriculum, teachers identified that it was children who approached teachers who were more likely to be taken notice of, and consequently their interests built the curriculum. In relation to this, Olivia was a child who ensured that teachers took notice of her.

Olivia asks Claire where Kylie is today - she has asked every teacher this today I think. "We were going to make chocolate fudge cake". Ah! So that's why she keeps asking. (1K/37)

Claire recognised Olivia's interest was shared among a number of children and frequently baked biscuits with children. However, the only time that children's funds of knowledge were almost called upon was on this occasion:

"Do you cook at home with your Mums and Dads?" Lots of yes responses, who they cook with and what they make, but Claire is focused on the ingredients. (1K/66)

One reason for Claire's lack of response on that occasion was that cooking and baking was not something she felt comfortable about initially, but learned alongside the children. Teachers agreed that a willingness to learn new knowledge and skills to co-construct experiences was involved in building curriculum on children's interests.

Without exception, in the individual interviews, when asked about children's interests, each teacher first talked about choices children made in the play environment provided, revealing how steeped they were in developmental views of play as a key informant to early childhood curriculum. For example:

I sort of see it as having activities available and equipment out available but letting the children respond to it in their own way and then you tweaking it and just going on from there. (Wendy/TI/140)

... Danyela, she comes in every day and wants to paint and that's her big thing. ... the same with Safiya, she loves painting as well and playdough. (Vicky/TI/127)

Most did not go beyond the play-based, that is, activity-based, focus on interests without my probing about a possible different interpretation related to the notion of

inquiry. The primacy of the learning environment as teachers' focus on understanding children's interests was highlighted through Olivia again as the connection to the present category of funds of knowledge was not made.

Olivia returns to her baking. Immy follows. Barbara walks outside "Olivia, it's just like you never left, you're in the sandpit." (1K/128)

Olivia and Imogen baked and cooked with their mother to prepare meals or for hosting social occasions, and represented this in their sand and water play on many occasions. However, teachers appeared to attribute their interest to sand and water play, or to aspects of their personalities. This demonstrated the prominence of play and the learning environment in itself, rather than what it might represent as a context for learning, and an opportunity to practise and progress funds of knowledge through elements of a spiral of knowing.

Moreover, I noted that some interests were recognised and responded to and others were not. In the example of Imogen bringing in a carwash card, Barbara recognised this as a new interest and experience and created a washing facility for the centre's vehicles. The opportunity to clean 1K's bikes and cars enabled Imogen to demonstrate her current understanding and practise her funds of knowledge in a focused way in collaboration with others, as well as inquire into the properties of sponges and bubbles. When I queried the rationale for providing this during a group inquiry session, Barbara responded in a way that recognised the importance of funds of knowledge.

Barbara - I knew it was something that was important enough to her to bring in, that tiny piece of paper, then it was important enough to expand on it. (COI/112)

Similar to the car wash card, bringing items from home that represented their interests, such as books, toys and photos, was an established way in which teachers recognised and acted on children's interests. However, at other times, items brought from home were not acknowledged in any depth, particularly if the item was small or represented popular culture. At both centres, these items were brought out at group times, but commonly returned to children's bags afterwards, rather than utilised to build spontaneous curriculum. The first indication of the somewhat chance nature of when and how children's funds of knowledge-based interests were recognised and

engaged with, and the dominance of the value of institutionalised and traditional play-based experiences, was realised.

Another example where observing and participating in domestic activities with parents was an important source of knowledge that children represented in their play was Luca and Gianni's interest in vehicle repair and maintenance, because of their experiences with their mother's car. Barbara's car required mechanical attention one day. This led to Luca, Gianni and other children examining with Barbara the motor and workings of both hers and Ruth's vehicles, and comparing these with those of their parents. Their working theory of where the motor is located was challenged by the experience of Ruth's vehicle where the motor is at the rear, thereby modifying their understanding.

At other times, dialogue with children revealed interests, working theories and understandings about growing up as responsible citizens. Tom frequently engaged in building with Mobilo and blocks, extending designs and accessories as he improved each model.

Tom - "I'm making lots of vehicles; I'm making great vehicles aren't I?" I ask why he likes vehicles. "Because I like to drive. But I can't drive our car real. Mum and Dad said I can drive our car pretending." I ask him how old you need to be to drive a car. "I don't know. 16? Yes! I tricked you, my Mummy telled me that. You have to be 16 to drive." I ask him when he will be 16. "When I'm an adult. When I'm a big school boy and then when I'm finished I'll be an adult." (TK/22)

On another occasion, while talking about watching a rugby game on television:

Tom says he watched with [mother and sister], his Dad was "at a café a long way away. He drank some beer and that makes you not able to drive so he got a taxi home." (TK/78)

The theme of inquiring into what adults do, and what children would do when they were older, was common in children's interests, and revealed in their dialogue with adults and children. Further support for these interests is evident in many following categories and these are the first themes identified in chapter eight's discussion of underpinning inquiry.

Parents' occupations

As Vygotsky (1978, 1986) claimed, children's dramatic play was another powerful way in which they represented and practised their knowledge in the centre. In the following example, a child's funds of knowledge were recognised through her play.

Isabel's Mum is becoming a doctor and she's picked up on that lately and quite often you'll see her like pretending to put plasters on people or she picks up the stethoscope and goes around and starts testing people out ... (Vicky/TI/127)

Parents' occupations were noted by teacher researchers using the funds of knowledge methodology and incorporated into topics of study in classrooms (González et al., 2005a). Similarly, in M. Carr's (2001a) narrative approach to assessment that draws on the contributions of parents as well as children and teachers, parental occupations influenced children's knowledge and interests. In the present study, some children were very aware of what their parents did as a job, while others seemed quite oblivious and uninterested. However, the potential of some parents' occupations for influencing children's interests and knowledge building is demonstrated in the following analysis of data and discussion of findings.

Table 6.2: Parents' occupations

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
Tom's mother - [describing her interest in plants] ... we often do the big walk down to Cathedral Cove through all the bush and I talk about the plants in the bush and the other time when we went with some friends and Bridget and Thomas were giving them a lesson and saying, look these are the korus, these are the baby ferns and these are the de-de and I thought I must have told them all that. ... And being a teacher you know you're always [telling them things]. ... they love to come to my classroom and they love to sort of see what I'm doing or help. (CFI/17-18)	<ul style="list-style-type: none"> • skills to teach others • adult responsibilities 	<ul style="list-style-type: none"> • scientific concepts of biology • curiosity • working theories about collaborative knowledge-building • peer tutoring
Olivia's mother - I only work 20 hours a week from home so she actually helps me with some stuff in the office We sit at desks ... and she'll punch holes and talk on the phone, pretend that she's a secretary. She loves doing that. (CFI/110)	<ul style="list-style-type: none"> • office and administrative tasks • adult responsibilities 	<ul style="list-style-type: none"> • interest • involvement • responsibility

<p>Lucy has Jaimée on her knee and is bouncing her up and down. Jaimée grins broadly and puts her arms up when Lucy stops to indicate that she wants more. Isabel is bringing over baby toys to near where Jaimée is sitting. Jaimée grizzles and Lucy puts her down. "Wait there Jaimée, sh sh". To me "I think she needs some pillows." She gets two large pillows and places them behind Jaimée, telling Isabel "This is so she doesn't fall down." ... Lucy "I want to have a baby like that." (1K/21)</p>	<ul style="list-style-type: none"> • caring for babies • adult responsibilities 	<ul style="list-style-type: none"> • interest • responsibility • communication
<p>Caitlin, Gina and Harry are in the family corner with [Name]. As I approach, Gina tells me that [Name] is the dad. Harry "No, I'm the dad." Caitlin to [Name] "You can be the big brother then." [Name], Gina and Caitlin each have a mobile phone they are carrying around with their baskets, dolls etc. ... Gina tells me she is getting the "kitty" some water. Harry is now a cat crawling around the floor. Gina calls him over for bowls of food and water. ... Harry says his baby needs a new skirt on and a nappy change. Caitlin takes over and changes its nappy. Harry is not happy with the result, telling me the doll needs different clothes on and changes the nappy and clothes himself. (TK/101-102)</p>	<ul style="list-style-type: none"> • caring for animals • caring for babies • adult responsibilities 	<ul style="list-style-type: none"> • working theories about family roles • collaboration

Tom's mother's interest in plants, and occupation as a teacher, influenced his and his sister's relatively sophisticated conceptual understandings of plant biology and ways to share knowledge with others. She recognised her influence on their learning through their intent participation and interest in her work. Olivia's mother's home office was a site of great interest and intent participation for Olivia. Her funds of knowledge expertise was enacted at 1K when the environment was set up to represent an office, but the activity not recognised by teachers as relating to Olivia's funds of knowledge from her home experience. During her play, Olivia demonstrated working theories about office work responsibilities and technical equipment.

Claire rearranges furniture and equipment to create an office - the keyboard, telephones etc. ... Olivia gets on the phone "Hi, can we just have something? We have a office. We need to print something out. OK, thanks, 'bye" (hangs up). She puts paper against the phone to 'feed' it through and tells me it will come out the other side with colour on. ... Olivia picks up her writing "I want to print it out." Lucy "print it out on the computer." Olivia feeds it into the keyboard this time, presses a key, watches it, then pushes it through manually. (1K/131)

Of further note, part of Olivia and Imogen's mother's job at the time of the interview involved investigating and writing about new children's playgrounds in Auckland, which she often took the children to during weekends. Alongside these experiences, coupled with her engaging, exuberant and inquiring personality, Imogen loved being outdoors at 1K. Many children showed an interest in extending and challenging their physical capabilities; developing working theories about the potential of their bodies to move and explore. Imogen was a capable and confident explorer and climber on all outdoor equipment. She would also both attempt and persevere with risks in physical challenges that same-aged siblings would not. It was highly likely that these dispositions were fostered by the experiences related to her mother's job, which may, in turn, have related to her mother's interest in sport, running and other physical pursuits.

An important and widely-shared interest, supported by evidence from other studies (e.g., Corsaro, 1985), derived from observing the occupation of parenting. Taking care of dolls and babies, through feeding them and changing their clothes and nappies, occurred in both homes and at centres. Here again, children were investigating and practising the responsibilities of adults in a society and also developing working theories about human growth and development, supported by wide experience and information gained from a range of settings. Across both centres, there was a gender bias, with more girls than boys interested in the babies. In particular, as experienced older sisters, Lucy, Olivia and Isabel were very knowledgeable about babies, demonstrated in the extract above. This interest was represented frequently by many children in family and dramatic play and was one recognised and extended by teachers at 1K (e.g., see pp. 161-162).

On an occasion when some children had gone on a trip, Imogen's interest in babies was used to distract her from being upset about not being included in the trip. She was afforded the opportunity to assist Barbara with morning tea for the infants, and did so with enormous satisfaction and pleasure, clearly seeing this as a special responsibility.

Barbara "Thank goodness you stayed behind Immy because I haven't got another teacher to help me." Immy beams with pride. (1K/191)

These kinds of real opportunities to assist younger children did not occur at TK because of the same-age-based nature of the sessions. However, the family play area was frequented a lot by Caitlin, Gina and Harry, who demonstrated in table 6.2 their understanding of family roles and responsibilities, including caring for pets. I noted to the teachers that during my observations, no teacher interacted with children in this area. They had noticed children's interest in the area and enriched it with equipment and resources, consistent with a focus on the quality of the physical environment, but between the group size, teacher-child ratio and other teaching responsibilities, interacting with children's funds of knowledge-influenced interests here was not prioritised. This became a point of TK teacher reflection during phase two.

Both centres used excursions as part of the curriculum to recognise children's interest in gaining first-hand experience and information to inform their knowledge building and inquiries. TK's use of excursions was further supported by a parent early in the year. Children nominated six venues for a possible trip and voted to visit one of these venues. However, a parent was able to facilitate a visit to another of those venues because of his occupation. In this instance, children's knowledge about and interest in fire-fighting was able to be supported and extended through intent observation and participation in experiential learning by the funds of knowledge afforded by the father's occupation. His involvement in this excursion was critical to its success for children's moving through the four components of a spiral of knowing: experience, information, knowledge building and understanding (see appendix 14, p. 354).

Parents' interests, talents and leisure activities

González et al.'s (2005a) edited collection focuses on parents' domestic tasks and occupations, but some of their stories include discussion of parents' interests. For example, as noted in chapter two, Hensley's (2005) discovery that a father played guitar and keyboard and wrote songs and poetry led to the production of a school musical. M. Carr (2001a) also identified that parents' interests can influence children's learning. Parents' stories about home experiences can provide worthwhile insight for teachers. Four examples are provided here, one related to a sporting interest and three related to leisure interests.

Table 6.3 Parents' interests, talents and leisure activities

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
<p>Tom - ... I practise for it and when I don't practise I play. I play rugby. You have to run where the flag is, in our play you have to run where the white line is and that white thing and then you score a try (CFI/18)</p> <p>Jack "I know about moons and stars and planes and boats..." - talks about boats, propeller, engines, noise and says he has a boat at his house. Barbara says later [to me] his parents have a yacht. (1K/7)</p> <p>Jack's mother -... I'm telling Helen about your tools and how Daddy's going to build you a workbench, put your own little vice on it, isn't he and then you can do some cutting like you did at kindergarten. (CFI/122)</p> <p>Lucy's mother - She knows all the words to all the songs. ... Just like I used to when I was little. ... Lucy - Yeah the Sound of Music. Lucy's mother - You love that don't you. That's one of Mummy's favourites so we watch it together and we sing don't we? ... She's got a fantastic voice. [father's name] and I are both reasonably good singers. This one has always had quite good pitch. Helen - So did you have musical backgrounds? Lucy's mother - Yes I used to do a lot of singing as a youngster and right through school and [father's name] was in the choir as well (CFI/93 & 103)</p>	<ul style="list-style-type: none"> • participating in a team sport • maintenance of boats • carpentry skills • music, singing and dancing • language and literacy 	<ul style="list-style-type: none"> • interest • concentration • collaboration • working theories re rules of rugby • interest • curiosity • communication • interest • involvement • connections between experiences • interest • involvement • collaboration

In NZ, sport is viewed as important and rugby is a particularly well-followed sport with links to national identity. Children's interest in matters related to national identity was another recurring theme developed in chapter eight. Tom had begun to play and watch rugby due to his father's interest and experience as a player. Tom's experience of playing, information gained from being coached and watching rugby on television had enabled him to develop working theories, in the form of expectations, about how to play the game. Tom was frequently found outside acting on his understandings: kicking, chasing, throwing and catching balls of various types with his friends. He also talked about watching rugby on television, revealing his current knowledge and inquiry as he added further information to his spiral of knowing about the game. Christine, in particular, asked Tom each Monday during the rugby season

about games he had played or watched, and provided opportunities to develop his knowledge and skills.

When I first met Jack, teachers described clearly how his knowledge about boats revealed in table 6.3 related to funds of knowledge from his parents' interests and values. During the interview at home, this interest was talked about enthusiastically. However, although Jack frequently talked about this interest and knowledge at 1K, it was not utilised in planning or present in Jack's portfolio at 1K. The explanation for this was his part-time attendance coupled with constraints on teacher time available to complete individual documentation.

Jack also revealed his funds of knowledge-related interests when he began attending TK in the middle of the year of fieldwork. Louise noticed him reading a book about boats and engaged in a deep conversation with him about this that was documented. Theresia also had a conversation with him about the family boat and documented this. In addition, at this time, Jack revealed other knowledge related to his observation of his father's painting at home, knowledge that was so accurate that Theresia wondered if it was his occupation. The level of detail indicated that Jack was proceeding through a spiral of knowing about the task of painting. By this time in the fieldwork, TK had removed the small "parent voice" boxes from the back of children's portfolios and were asking parents for "stories from home" on a full page. Jack's mother wrote one to explain Jack's interest in and knowledge about boats. This gave the detailed history of their restoration of the boat and the nature of Jack's understandings, including his own verbatim dialogue with her. Jack had also become interested in carpentry as a new experience available to him at TK. This, too, had connections with home experiences. As indicated in table 6.3, Jack had his own workbench and tools at home.

Stories from their home and 1K gave insight into Lucy and Billie's interests in music and dancing that did not appear to be fully recognised by the teachers, despite their close relationship with the family. Lucy frequently asked teachers for music, danced with her friends and sang along to a range of music. Whether or not the teachers knew about the connection with her parents' interests and funds of knowledge was not clear, but there was no indication in conversations with me or in documentation.

However, different types of music were played by the teachers at children's request, to enable children to act on their knowledge and peer tutor others, particularly younger children.

Thus far, results have been described using González et al.'s (2005a) focus on parents' domestic and work activities and interests. The next category draws on Riojas-Cortez's (2001) categories of funds of knowledge related to parents' language, behaviours and values.

Parents' language, values and beliefs

Children's interests in making and communicating meaning, within special relationships with people, were two further themes in their interests and inquiry. Jack's language demonstrated how the language parents use in conversations and interactions with children influences their experience, information, knowledge building and understandings as the four components of a spiral of knowing. Jack had an extensive and specialised vocabulary and working theories about a wide range of interests. This came from his inquiries at home being responded to using adult language; explanations that treated him as a competent and capable learner.

Another example of parent language related to Imogen and her father's repeated use of the words "my favourite". For several months during the year, she repeatedly wanted to go on a lion or bear hunt, accompanied by other children and teachers. This interest made connections between home and centre experiences, as the relevant music and books were present in both environments. Further, her funds of knowledge in music were supported by attendance at a community-based music session for toddlers. Like her sister, she ensured that she approached teachers in order to follow up on her interests.

Immy "lion hunt? That's my favourite ("fravrit")." [Name] tells her that it's Claire's birthday but this does not distract her from her mission. She asks Barbara where the lion hunt CD is. Barbara talks about the possible CDs that it is on and they look together through the CDs as Immy repeats several times that it is her favourite.
(1K/113)

Imogen's focus on the lion hunt occurred for a significant period of time during the year. This demonstrated the importance of repeated opportunities over time for children to engage in interests-based activities in supporting learning constructed as a spiral of knowing. It also suggested a child's capability to sing and act out a song with increasing competence and confidence be viewed as an example of an outcome of knowledge building in the manner of a spiral of knowing. Moreover, it brought to consciousness teacher understanding about the importance of establishing what a child's genuine interest and/or inquiry is, and not misunderstanding or misrepresenting this to lead a child in the direction of conceptual learning before s/he has exhausted the everyday learning possibilities.

Angela - ... if you didn't know Imogen as well as what we all do, it's an important part in finding out their interests is that you could go, oh she wants to learn about lions but she doesn't really want to learn about a whole pile of lions, she's enjoying that moment and that song so it's been really important that you don't go smothering her up, we're going to learn about lions now (COI/9)

One Friday, Imogen and various friends went on fourteen lion hunts consecutively in the art room and outside playground, accompanied by the song. The teachers knew that this was important learning for her and acted on her request for repeats, never attempting to distract her or suggest she move on. Further, on other occasions, they helped her find a lion costume to wear while she engaged in her socio-dramatic play.

In the present study, parental focus on values and beliefs about the importance of education was evident. In considering children's own interests, several parents indicated they co-constructed knowledge collaboratively with children. In particular, in relation to culturally valued knowledge, many parents expressed an emphasis on supporting children's literacy development as an important cultural tool that assists communication and meaning making. This often manifested in children's interest in books, which children also appeared to enjoy because they enabled special connections and affective relationships with people to occur. Books also extended their knowledge of the world and communicating meaning through the spoken and written word. Jack, Caitlin, Lucy, Billie, Greta and Leah's parents all commented on these matters during the interview. Jack's mother discusses this in the following examples.

Table 6.4 Parents' language, values and beliefs

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
<p>Jack's mother: He likes birds so I suppose like if I go to the zoo ... we make sure we see the penguins or straight in to the birds. Helen - Are these things that you know quite a lot about too or have you Jack's mother - No I tend to learn things through him. I like birds but I don't know maybe it's as subtle as coming from ... when you're driving along the motorway. We tend not to say that's just a bird but try and figure out what it is, an oyster catcher or a peacock. (CFI/137)</p> <p>Jack's mother - He loves "The Very Hungry Caterpillar" on DVD. ...I've got The Very Hungry Caterpillar [book] It's really interesting listening to him because that was one that he grabbed and he sat himself up on the couch and was reading it when the DVD wasn't on and he was reading it aloud ... it's like it's definitely the detail that he's focused on with those things and he'll correct us if we read the wrong word in the story. He just remembers it. That's quite big at the moment. ... Helen - I can see that he's had a lot of that kind of input. (CFI/137)</p>	<ul style="list-style-type: none"> • everyday scientific concepts • ways of accessing knowledge • literacy • technology 	<ul style="list-style-type: none"> • interest • curiosity • communication • co-construction • scientific concepts • positive disposition to learning • interest • concentration • involvement • communication • cultural tools and symbols

In relation to literacy, Jack's mother commented:

Jack's mother - It's a passion for me, I suppose in terms of interest. If I had one that was strongest to do with children, that would be that, whereas [Jack's father] and I are thinking to ourselves we need to make sure we get him out and throw the ball a bit more but you can just see how parental interest will inevitably kind of focus where the child is at. (CFI/138)

Jack's mother's comment about the impact of parental interests on the child's interests is insightful about the direction of children's interests and funds of knowledge. The book that she spoke about was a shared favourite among children. Jack's funds of knowledge-based interest in the book was noted and harnessed as appropriate to a group situation at 1K.

Wendy says that Ronan has brought in "The very hungry caterpillar" story and shows the children the book. Jack starts telling the story in detail but Wendy asks him to

stop as some children might not know the story. As she starts reading, he points out features on each page, firstly the egg, then the caterpillar "he is a fuzzy one and he is green", then "there is the sun." Wendy "Jack, can you listen to the story please?" He listens quietly through the rest of the story. At the end, after the caterpillar has eaten all the food, Wendy asks him what was wrong with him, what a stomach ache means. Jack "sore tummy" and rubs his tummy. (1K/101)

Tom's mother revealed an interesting value, understanding his deeply-absorbing interest in construction and its non-permanent nature, and a need to be able to revisit learning in a spiral fashion to build on experience and knowledge.

Tom's mother - What I've done with some of his Lego creations ... because he's got to break them up after he makes them and so I've taken lots of digital photos and I've put them all together in a little booklet for them so he can perhaps revisit some of his designs. (CFI/19)

At home and at TK, Tom engaged for lengthy periods of time in activity with equipment such as Lego, Mobilo and blocks. For some time during the year, many children were involved in constructing marble runs that grew in length and complexity. These resources formed a common way in which children could be viewed as engaging in working theories about, and positive learning dispositions towards, mathematics and physics. In addition, they developed artefacts based on their experience, information, collaborative knowledge building and reflection with adults and peers. Tom's increasingly complex buildings and vehicle constructions at home and TK were recognised and documented in both places, but not connected.

At TK, Tom's Mobilo construction occurred collaboratively and often tested friendships such as his one with Ben, through competition to build better models. Further, it was commonly influenced by popular culture such as Spiderman and Ninja Turtles. Tom's block building was more often solitary or with either Zach or another special friend. He was both inquiring into and extending his knowledge of the world and expressing his creativity through these constructions, two further important themes in children's interests. Teachers recognised his concentration, perseverance, and the space required (in the area mat time usually took place in) to undertake the serious and extensive constructions he engaged in. There were occasions when the kindergarten routines were adapted flexibly to take account of such activities, such as not having a mid-session mat time so that the constructions were not disturbed. In

addition, teachers frequently engaged in conversation about the constructions and posed challenging and extending questions to develop them further.

Parents valued children being able to make links between the home and centres. For toddler Billie, cuddling her special bear, Da, and reading books were favourite activities at home and at the centre. This revealed another way that children's interests were utilised to create curriculum particular to 1K; to settle children into the centre for the day upon separation from a parent. Billie's interest in literacy also led to her own verbalised symbol recognition, illustrating an early connection between everyday and later conceptual learning of literacy and the importance of increasing verbal capacity in expressing inquiry.

She picks up a shaker with 'shake me' written on it, says "name". I say it's a shaker, then she points to my badge "name" and to the shaker "name". I now realise the link that she has made. "Good girl Billie, these words are my name, those are words too, they say 'shake me'". She smiles broadly. (1K/30)

In relation to a fundamental interest in making and communicating meaning, the infants' and toddlers' interest in books and reading was recognised and incorporated explicitly into 1K's planning. Young children also demonstrated an interest in reading books with adults and learning the skills to become self-sufficient readers. In the following instance, two four-year-olds demonstrate phonological awareness, an important precursor to reading.

Part of the book has the letters of the alphabet, with alliterative stories underneath funny pictures. Lucy and Jayde recognize the letters and Jayde associates them with people she knows e.g., D is Daddy, J – Jayde, K – Kayla (my cousin), L – Lucy, M- Mummy, N – Nana. (1K/20)

Developing everyday and early conceptual knowledge of literacy was an important interest shared by teachers, parents and children. This was a strong example of where interests intersect becoming a co-constructed curriculum emphasis, perhaps explaining literacy's dominance in the curriculum provision.

Children were interested in writing from an early age. Imogen's research participation with me (see p. 174) demonstrates this in toddlers. Four-year-olds were also

interested in this symbolic representation and meaning making literacy funds of knowledge. On this occasion, showing an interest in the lives of adults outside the centre, while drawing with chalk on small blackboards, Lucy, Olivia and Jansen have been asking me about my children.

Lucy tells me "Draw Rebecca, no, write her name". I do so and she reads the letters. She asks me to do the same for Christopher. ... Lucy asks me to "write the girl's name again so I can write it". She writes after me, forming the letters quite well apart from 'b' and 'a'. She then asks for "the boy's name again" and has already written a C before I start so she has remembered the beginning of the name. She has trouble with the letter 'h'. ... Lucy has some difficulty with 's' and then 't' (practises that one twice) then succeeds in completing writing the name. She moves to another board and writes her name and Billie's on it. (1K/26)

Moreover, children were also exploring other modes of presenting written material.

Shannon "I'm using Mum's computer to write letters and print them out. But I'm not finished yet; I've got more to do." He lists the words he is writing, names, favourite foods, songs, Australia. (TK/32)

Constructing knowledge of literacy and numeracy, as examples of Vygotsky's scientific concepts and valued cultural tools, requires that children gain experience and information about these in authentic and meaningful contexts. These contexts involve funds of knowledge gained in a range of settings as illustrated here, and are further promoted by parents' valuing of them. Teachers' recognition of the importance of literacy for children also came from their own beliefs as well as recognising this funds of knowledge-based interest in children.

In González et al.'s (2005a) edited volume, the presence of grandparents, and their funds of knowledge, is clearly an influence on the parents interviewed, but direct links between grandparents and children are not explored. González et al. (2005b) acknowledge that "[t]he knowledge of grandparents, aunts and uncles, and extended family relations are also resources that go beyond the nuclear family" (p. 12) but do not develop these. Therefore, the present study's interpretation now identifies new categories by acknowledging the pedagogical relationships and contributions of other adults and children in children's lives and how these increase children's experiences, knowledge building, and development of working theories.

Grandparents' occupations, leisure activities and interests

Without exception, in the home interviews, when I asked about other people the children enjoyed spending time with, every parent or child talked about the child(ren)'s grandparents first, revealing their importance in children's lives. Grandparents often provided support for families. For example, Meg, Tom, Ben, Caitlin, Jack, Greta and Leah had time with grandparents while their parents were at work. While many grandparents appeared to be retired and their leisure interests impacted on children's funds of knowledge, some were working and their occupations provided children with further funds of knowledge. Three examples follow:

Table 6.5 Grandparents' occupations, leisure activities and interests

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
Meg - At Grandma's! ... We play banks 'cause my gran works in a bank, play banking, we play shops She has like the bank books and we set up money and stuff. (CFI/154)	<ul style="list-style-type: none"> • managing money • shopping 	<ul style="list-style-type: none"> • collaboration • thinking mathematically
Leah and Greta's mother - And the art is probably something that, well, my Mum paints a lot as well and [their father]'s Mum's quite creative too, she knits and things like that, that sort of thing, sort of making things. (CFI/64)	<ul style="list-style-type: none"> • arts and crafts • art appreciation 	<ul style="list-style-type: none"> • interest • involvement • perseverance • creativity
Helen - What else do you do that's special while you're there? Olivia - Play drawing and glitter. Olivia's mother - Granny's very artistic, she's a painter, I think we've got another one happening. (CFI/109-110)	<ul style="list-style-type: none"> • arts and crafts 	<ul style="list-style-type: none"> • interest • involvement • perseverance

Meg's time with her grandmother was not only helping her understand the role of work in adults' lives, but beginning her thinking about managing money. Leah and Greta's two most prominent interests at home and TK were, firstly, dramatic play with animals that acted out their understanding of family roles and responsibilities (see p. 175). As Inagaki and Hatano (2002) point out in relation to naïve biology, "children exploit their relatively rich knowledge about humans to make educated guesses about other entities" (p. 2). Their second major interest was creative arts. The likely origins and influences of the latter became evident to the teachers and me as being both

maternal grandmothers. The opportunity to demonstrate these funds of knowledge competently in the centre setting occurred when mosaic tiles were created for the garden.

Christine showed me mosaic design patterns and first efforts last week. It turns out that [Leah and Greta's mother] and her Mum do these so Leah was first in, "I want to do a heart", knew exactly what to do and how etc. Greta was second. (TK/57)

It was through provision of this activity, listening closely to the girls and confirming their story in a conversation with their mother that Christine learned about their funds of knowledge. Fieldwork data showed that Greta made links to her home experiences and interests in her creative artefacts, while Leah's interests were stimulated by centre activities. For example, she was interested in butterflies and, consistent with moving through a spiral of knowing, responded to knowledge gained from Christine at mat time to improve a model of a butterfly she had begun three weeks earlier. The creativity involved in constructing and reconstructing objects pointed to another fundamental interest of children's discussed in chapter eight.

Some grandparents lived by the beach, and/or had swimming pools, and/or had the children stay for holidays. These opportunities, coupled with the special responsive relationships shared together, enabled children to gain additional experiences and skills, such as Olivia's in art revealed in table 6.5. Olivia enjoyed painting, making cards and writing in them, and collage involving glitter at 1K. These interests were recognised by teachers and catered for through their emphasis on a richly-resourced environment, but appeared to make no link to the grandparents' funds of knowledge.

Grandparents also stood in for working parents in matters such as parent help at kindergarten or school. One of Jack's grandmothers settled him into attending TK. The talents and interests revealed were commonly followed up with children to develop further funds of knowledge, such as Caitlin's ability to sew.

Caitlin is talking to Christine about sewing things with her Nana. ... In particular, they have made a hand bag and she describes that at length. In response to Christine, she says it was all her idea, she chose the fabric etc. (TK/127)

The potential of grandparents' and parents' contribution to curriculum was illustrated in the following way at TK. Ben's interest in sewing a cape like two other boys had sparked off an interest in sewing capes throughout the year. This sewing project

extended to children making skirts and bowties for the annual disco in June. Theresia, who was interested in handcrafts and brought this fund of knowledge to the endeavour, was the teacher leading the project and supporting the children's sewing. This illustrates again that curriculum was most often co-constructed where teachers' and children's interests coincided. As the date of the disco drew closer, pressure mounted with the number of skirts yet to be sewn. Theresia utilised a student teacher with another sewing machine and also drew some of the community in to support the Asian children. These children had been unable to yet act on this interest because of limited English and because other children were noticed first. This illustrated whose interests are noticed, how others are drawn into peers' interests and how teachers can work sensitively to ensure all children are then catered for.

Christine - ... it was all our little Asian children [who] are non-English speakers. Now when the capes and the disco skirts and things first started, these girls were all there [but] didn't have any communication skills so they kind of got swept to the side and everybody else's needs got catered to first because they were louder, they were more in your face, they could articulate what they wanted so I came back at the end of one term with a specific intention that I would collect this group of non-English speakers and show the fabric and somehow convey to them that they could have go as well and so it was an interest of theirs too but they didn't have the communication. They needed the teacher to step in and say there's got to be a way we can make this happen for you and they all did. (COI/138)

Christine says that the sewing project has brought the community in, in the way that they wanted. Several of the Asian girls had made skirts, with Qing Qing's mother and someone else's grandmother both parent helping and translating as necessary. (TK/51)

This example also demonstrates the importance of language as a cultural tool that enables shared dialogue. For many children, an inability to communicate and make meaning with adults and friends curtailed some opportunities to develop interests, participate in activities and, therefore, develop spirals of knowing. Moreover, although she spoke English, Qing Qing played either alone or with a friend who shared her first language. Her play-based interests were in books, creative arts and the family corner, frequently repeating activities rather than extending them. Theresia had an affinity with such children and encouraged them to take risks, but often without success.

Adult relations' and family friends' interests and occupations

The funds of knowledge of another group of adults impacted on children's interests and inquiries. They were other significant adults in their lives, such as family relations or parents' friends. For example, I had noted Tom's focus on construction activities from early in the fieldwork and that this was an activity recognised and extended by teachers.

When I comment on Tom's interest in Mobilo construction and wonder if he might be an engineer in future, [Mother] comments that his uncle is an engineer, not sure what type. (TK/31)

Tom had another uncle who had taken him fishing. He had learned an enormous amount from this experience. When asked what he liked to do on the weekends with his family, he talked animatedly about his new detailed knowledge about fishing.

Tom - We go on Uncle Johnny's boat sometimes. ...

Helen - So what do you do with the boat?

Tom - Have a ride in it and do some fishing. ... You have to put your line out and put something on the fishing line and wait and see if one comes and then if the fish is on the bait and then you wind it up and then if it's small you have to throw it back or if it's big you keep it. ... Sometimes we get snapper and sometimes you don't get snappers. ... Yeah. And I drove the boat I was sitting on Uncle Johnny's knee and he told me where to go. (CFI/6-7)

This category was not one the teachers might necessarily recognise in children's play-based interests without thorough dialogue. It also highlights the importance of obtaining different kinds of information from parents to support deeper understandings of children and their interests and inquiries.

Children were deeply interested in making special connections with adults and peers in a range of settings, another underlying theme discussed later. Rogoff (1998) noted that much research focuses on adults leading children's learning and less on ways in which children use their expertise to influence each others' actions or engage in shared thinking. This analysis now moves to children as knowledgeable experts to explain how children's interests and inquiries are stimulated, adopted and noticed by others. Child peers as an influence on children was not explored in the existing literature on funds of knowledge.

Siblings' and cousins' activities, interests and language

Children's own siblings and their cousins had funds of knowledge that could be tapped into. These enabled children to test, develop and challenge working theories, in particular about human relationships, roles and functioning. The following examples focus on children's knowledge learned from siblings, utilised in their play at home and the centre.

Table 6.6 Siblings' and cousins' activities, interests and language

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
<p>Tom, Ben and others on the fort are playing Spiderman. Theresia suggest getting ropes to make a Spiderman net. Tom tells the others that he will do the knots and begins to organise them. ... I ask him who showed him how to tie knots. "My sister". (TK/28)</p> <p>Helen - And what things have you taught him besides tying ropes?</p> <p>Tom's mother - Lots of things I'd say. She's always teaching him.</p> <p>Bridget [sister] - I taught him how to click. Both hands.</p> <p>Tom's mother - And they often dance together, Bridget does dancing, they'll make up shows. And on the trampoline she'll teach him different things.</p> <p>Bridget - I taught him how to flip. (CFI/22-23)</p>	<ul style="list-style-type: none"> • rope tying (safety) • physical skills 	<ul style="list-style-type: none"> • interest • involvement • concentration • collaboration • peer tutoring
<p>Billie goes to look at the area Angela has created and tells me "ugh, s'gusting." I ask what is disgusting. "Foo Foo's got a skanky bottom." ... Billie goes to the swings and goes to climb into the barrel. She stops "ugh, skanky." She has seen a dead slug and some bird excrement in there. ... I mention to Angela that Billie seems to have a new word in her vocabulary She says that Billie has taken on some of her sister's behaviours and mannerisms recently and this is likely to also be where she has learned the word skanky from. (1K/208-209)</p>	<ul style="list-style-type: none"> • language (colloquial) 	<ul style="list-style-type: none"> • interest • involvement • concentration

Caitlin's interest in writing, spelling and maths was attributed to her brother's school work. Similar to Jack's mother's comment about parents' interests influencing children's, Caitlin's mother made an insightful comment that highlighted the

significance of older siblings in determining the direction of younger siblings' interests and knowledge building.

Caitlin's mother - ... we tend to be driven by what Thomas is interested in at the moment ... like Playstation, dinosaurs.... (CFI/44)

Although Caitlin was happy to acknowledge and act on knowledge learned at home from her brother in the centre setting, Tom and Ben appeared not to do so in relation to their older sisters. As noted in table 6.6, Tom had learned a range of things from his six-year-old sister. Tom and Ben played with their sisters at family and dramatic play at home, such as with dolls' houses, dressing up and playing babies and pets, and playing school roles where the older sister was the teacher. Yet, none of these interests was acted out at kindergarten and remained unknown by the teachers who were, somewhat ironically, trying to value what they described as "boys' play". It is beyond the scope of this thesis to investigate the gender or other issues that may lie beneath this. What is relevant is that this was evidence of funds of knowledge-based interests not tapped into by teachers.

At 1K, siblings were sometimes gatekeepers of opportunities to pursue funds of knowledge-related opportunities too. Olivia and Imogen's interest in baking has been established earlier. However, often when the younger siblings wanted to join in with the older ones at the centre they were prevented from doing so.

Immy approaches the sand mixture. Olivia "No Immy" and Immy goes to get her own equipment. Children are slowly tidying up and then the drum goes for mat time. The older girls leave their 'baking' and Immy and Billie see this and seize their moment to go to the sand and water baking and play with it. (1K/62)

Yet, at other times, the bond of sisterhood was used to exclude others from participation in areas of interest, supporting a different working theory about connections between human beings.

Olivia and Lucy finish making the cake Marcella now tries to join in. Billie "No no." Olivia "She's not a sister." Immy "No Cellie." Olivia "Cellie, for goodness sake no." Marcella moves to one side near Billie and continues playing. (1K/128)

This interaction extends Corsaro's (1985) analysis of peer interactions, where friendship bonds were commonly used to defend play areas and activities, to the

special case of siblings as peers. Further, along with the example of Billie's language cited in table 6.6, it provides an example of Rogoff's (1998) idea that siblings as peers support learning by acting or speaking in ways adults are unlikely to.

Several family interviews also explicitly talked about the influence of special peer-age friends and cousins on their interests. For example, Caitlin had cousins who lived nearby and came to stay at her home. They enjoyed playing doctors and riding bikes together. Tom spent time with cousins each week at his grandparents' home while their parents worked and enjoyed a range of activities with them. Siblings at the centre were recognised by teachers as a source of interests, but they knew little about older siblings unless they had attended the centre, and, less, if anything, about cousins. Child peers are returned to in the analysis of centre-based sources of funds of knowledge.

Holidays and other community experiences

Family holidays created funds of knowledge opportunities for some children. For example, Caitlin went on a trip to visit family in Malaysia during the year.

I ask her about the ride on the elephant. She tells me she rode it with "Alyssa my big cousin and Mum." Alyssa is "about 14." (TK/118)

However, she chose not to present this holiday as a news topic. When I asked her about this, she said shyly that her mother had forgotten to bring in their photos. Although Christine, in particular, valued travel experiences, the teachers did not encourage Caitlin to talk about and share such interesting experiences with the whole group, or follow up in some way with an otherwise confident and articulate child. While an avid front row participant at mat time, and assuming her portfolio was accurate, Caitlin never offered her own news as one of five children who self-nominated to do so each session. Again the somewhat serendipitous nature of whose funds of knowledge, interests and inquiries co-construct curriculum, when and how, was highlighted.

Family capital also afforded opportunities such as dancing classes, access to swimming pools and family outings that created other sources of funds of knowledge. Here, the full circle of the spiral of knowing can be seen through the children's experience, information, collaborative knowledge building and action, often practised

in the centre setting as well. A number of girls in both settings attended dancing classes, both ballet and jazz. At 1K, teachers were aware of this fund of knowledge and encouraged it during play, but were unaware of any detail about it.

Claire is talking to the children at the other table and calls out to Meg and Lucy to ask about what kind of dancing they go to, it's not ballet but none are quite sure what type it is. (1K/32)

At TK, girls frequently talked about their classes and recitals informally. One brought along a ballet programme for news.

Louise – ... I had someone do news yesterday, she went to the Nutcracker, I'm not very familiar with the Nutcracker story but it's those things that are coming up, it's not just movies. These children are going to shows at that age. (COI/128)

While recognised as an interest, despite the large indoor and outdoor areas, this and other children's experiences of attending shows and actually performing were not extended, for example, to creating performances at the kindergarten. These kinds of examples of teacher action, or lack of action, were an indicator that the evidence teachers draw on and the decisions made about curriculum were complex. Blending the planned curriculum such as the learning environment per se, children's challenges (see also pp. 108 & 168), preparation for school workbooks (see pp. 164-165), and centre routines such as mat times, with opportunities for spontaneous curriculum experiences, was difficult for the TK teachers partly due to group size. Coupled with the teacher-child ratio, it was inevitable that some children's interests and inquiries would not be followed or extended spontaneously. Teachers acknowledged this was usually the case with quieter and more self-sufficient children, and that having systems in place to ensure these children were noticed in some way was important.

Tom revealed at the family interview that he had wanted to go to the Sky Tower for a TK trip but this had not been the agreed vote. Instead he went with his family. This experience led him to develop new working theories and understandings of his world.

Tom tells me that he went to the Sky Tower in the holidays. (That's great; you've been wanting to go there. What did you see?) ... "You have to climb to the top up the escalator by the bungy jumping. I want to do the bungy jump." (I bet you do! What did you see from the top?) "The world. There's glass and you can see the cars at the bottom. And there's a TV you can control with the handle and there's yellow buttons and you can control what you see of the world." (TK/93)

Confident and articulate children shared stories of these experiences on arrival at each centre or at news time during group sessions. Quieter children rarely did so.

Therefore, teachers' knowledge of children was affected by how outgoing children were and the efforts that teachers could make, constrained by their myriad of roles, to engage less forthcoming children and parents in conversation.

Other experiences with their families also created funds of knowledge for children to draw on in their interactions. One in particular, shopping, was the most popular news topic at both centres, with children recalling the experience in great detail to reveal the knowledge gained. At TK, news time was also when teachers taught children about sharing information and questioning.

Ben says they have got a new telephone and describes it in terms of its size and shape and that it sits on a stand. Christine asks for more detail of this and positively reinforces him for holding all this information about size and measurement in his head to tell them. Ben tells the group it can go on speakerphone and that he has talked to his Dad on it "without holding it onto my ear". ... Christine asks how come he chose it, not [his sister], and if he negotiated which one with her. "I didn't talk, I just chose." Christine praises him for being so decisive. She tells the children they will have questions today and to remember to make sure that the question is in their head already before putting up their hand. [Name] asks why they got a telephone. Ben "Because the other telephone was all rusty." Trent "Why were you allowed to get the telephone?" Ben "Because my Mum said I'm only allowed to choose and my Dad went to pay (for) it" Christine asks what shop he got it from, "that's a tricky question, you might not know." Ben says they got it at Belmont. (TK/86)

Relationships have been noted earlier as the key constituent of social capital (Field, 2003) and family capital (Donati & Prandini, 2007; Li, 2007; Marjoribanks, 2005). This section of the chapter has highlighted that there are a number of significant pedagogical relationships that children engage with beyond that of parents. A range of adults and peers linked to children's family settings are important sources of funds of knowledge. The notion of family capital might be extended to consider "community capital" as a term to explain further ways children's funds of knowledge learning is supported in other pedagogical relationships. The next two sections describe such opportunities.

Centre-based funds of knowledge

Funds of knowledge-based interests and opportunities were experienced in the early childhood centre setting through pedagogical relationships with peers and teachers. Rogoff (1998) noted the need for research to identify ways in which children use their expertise to influence each others' actions or engage in shared thinking. Further, Rogoff notes that peers may assume important roles rarely fulfilled by adults. Peers' interests were a key stimulus for the development of interests in other children, as the earlier example of children making capes and disco skirts (p. 153) illustrates.

Peers' interests and activities

Spending time with peers in early childhood settings has long been a way that children experience being able to share different worldviews and experiences with other children (Corsaro, 1985). Examples follow of the range of ways they influenced each others' funds of knowledge.

Table 6.7 Peers' interests and activities

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
<p>Safiya to me "Where's Imogen?" (She's not usually here just yet.) "Where's Imogen?" (I'm sure she will be here soon.) I ask Angela about Safiya's progress in her friendship with Imogen. Angela reports that her perseverance has indeed paid off and they are now good friends and play together a lot. However, as she told her Mum "but not Billie, she won't talk to me." Is this a reflection on Billie's language ability/maturity/interest (lack of) in Safiya or reflecting the competitive state of the friendship I wonder? (1K/159)</p>	<ul style="list-style-type: none"> relationship skills 	<ul style="list-style-type: none"> being a friend perseverance communication
<p>Billie joins Danyela dancing to Spanish/Mexican music. They move their bodies in time with the music and clap at the end of each song. Lucy and Meg begin running and teasing each other again, then join in the dancing, including showing Billie some of the moves from their dancing lessons. (1K/33)</p>	<ul style="list-style-type: none"> dance as a cultural and leisure activity 	<ul style="list-style-type: none"> interest involvement peer tutoring
<p>Zach to another boy: "Here, you have a go [Name]. Here you go. Stand up on that edge." [Name] climbs up gingerly but can't balance on the edge in order to take the rope with his hands. He jumps down. Zach</p>	<ul style="list-style-type: none"> physical skills such as climbing, balancing 	<ul style="list-style-type: none"> interest involvement risk taking

<p>"Hey, you hold it and I'll show you how to jump off the edge." [Name] does so, Zach climbs, takes the rope and swings. "OK? See that? You try." [Name] starts climbing. "There you go - it's really high, eh? (No response from [Name]) OK, you try it now. I'll show you how. You stand up on the corner like this." Again [Name] is unable to balance, wobbles and jumps off. "I'll show you. Like this. (Demonstrates while talking) Wheeee!!" ... "Now you try. You climb and you have to jump on it and go at the same time." [Name] climbs up and this time takes hold of the rope and balances. "Hold that middle knot." [Name] puts his hands slightly further up the rope, over balances and topples down. "Hey I'll show you how to do it again." (TK/134)</p>	<p>and jumping</p> <ul style="list-style-type: none"> • ways to teach others 	<ul style="list-style-type: none"> • peer tutoring
<p>The older children (Lucy, Jansen, Olivia and others) go from there to the sandpit where they negotiate roles over a birthday party. One says Eeny meeny miny mo to decide whose birthday it is and a girl is chosen. Olivia "that's not fair!" The child says she will do it again to see who will have second turn. Her finger points to Lucy at the end of the Eeny meeny miny mo. Olivia "that's not fair" and does Eeny meeny miny mo herself and points to herself. The child compromises that it can be everyone's birthday. Lucy says she will make the cake. Olivia joins in with Lucy but Lucy says she wants someone else. Olivia tries to help her again. Lucy "No Livvy I don't need any more things". Olivia "Stop being so bossy." Lucy moves to another part of the sandpit saying she is making [someone else's] cake. Olivia makes her own cake in another part of the sandpit. (1K/56)</p>	<ul style="list-style-type: none"> • the expectations and rules of social occasions • managing conflict 	<ul style="list-style-type: none"> • interest • involvement • collaboration • leadership • perseverance • negotiation • shared understandings
<p>Immy notices rain water that has collected on the [table outside]. Immy puts her doll into the water "I wash baby's hair." ... [Safiya and Billie join her.] Immy describes her actions "Wash your face bubba, wash your tummy, wash your bum bubba, wash your bum, and your legs and your arms and your face." The girls' clothes are getting wet so Immy takes her sweat shirt off. She then tells the others "I take barks off" and begins to pick up and remove the pieces of bark in the water. ... Billie joins in "I get some" and picks up pieces of bark to put in the water. Immy "You putting poos in bath." The girls all giggle and pick up more bark to put in it. Billie then runs off vocalising loudly and laughing. Immy calls "Wash your baby Billie! Wash your baby!" Billie returns and the three of them continue to wash their babies with the water being swished everywhere. Danyela is watching intently. ... They pick up their dolls. Immy "My baby's dirty, I need to bath it." She heads off up the ramp and the others follow her. Barbara</p>	<ul style="list-style-type: none"> • caring for babies • human health and well-being 	<ul style="list-style-type: none"> • interest • involvement • collaboration • leadership • perseverance

<p>asks where they are going. They don't reply as they are on a mission so I explain the mission's purpose. Barbara offers to get them a baby bath with warm water and flannel. She gets two dolls' baths from the family corner and they talk about getting warm water and soap. ... Barbara sets Danyela and Immy up outside on a wooden table in a sheltered sunny spot near the sandpit. They set to, concentrating carefully on bathing the dolls with the flannels and soapy water. Immy tells me "Safiya got a big big big bath." Danyela "it will have to go down there" looking at the ground beside them. Safiya arrives with Barbara. Barbara "You got the spa pool Saffy." Danyela "You got spa pool." Immy "I got big big bath." Barbara offers them baby shampoo that she puts on the dolls' heads. She encourages them to rub it in with their fingers but they continue to use the flannels. ... Barbara praises the girls for their careful washing of their babies. (1K/165-166)</p>		
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Children's interest in peer friendships was a feature throughout the study's data and evident in all the interactions above. The importance of social interactions as a basis for what it is to be human was evident, again supporting both theories of social and family capital. Infants' non-verbal efforts to attract the attention of peers and adults were a strong motivator in their play interactions. Becoming and being a communicator who could convey meaning in various ways was a prominent motivation to develop funds of knowledge in communication and later literacy. Aidan's efforts to establish relationships and communicate meaning occurred from early attempts to approach teachers and peers, and vocalise and smile winningly at them.

Discovering the value of friendship is an important step in children's social development (Corsaro, 1985). Among the toddlers, Safiya enjoyed Imogen's company. She also appeared to perceive that a friendship with a popular child such as Imogen would open the door to other opportunities, and therefore funds of knowledge, and pursued a friendship with her fervently as demonstrated in table 6.7. Friendships enabled children to extend each other's learning, thinking and achievements by drawing on each other's experiences and funds of knowledge. This is particularly clear in the example of the doll washing led by Imogen. Supportive, child-initiated peer tutoring, such as with the example of Zach, was common in both

centres and enabled children to act on knowledge of how they themselves had experienced being encouraged to learn something new.

For older children, friendships also provided a way to act on and test out other dispositions and working theories in terms of expectations of others about turn taking, sharing, leadership and fairness; all important to being a responsible member of a community and culture. Friendships also perhaps assisted children to develop other dispositions necessary for inquiry learning such as communication and perseverance. As Rogoff (1998) pointed out, peer relationships enabled these to be tested in ways different to that which would occur with adults. The example in table 6.7 of negotiating roles for an imaginary birthday party illustrates this in relation to conflict resolution as an important disposition and skill children were working on. Ben's wish to make a cape, referred to earlier in this chapter, resulted not from any desire to participate in superhero play but his wish to be friends with a group of boys.

Theresia - Ben and his cape. I want to play with these people and he'd used all his social skills and said 'can I play with you?', 'no'. 'Why can't I play with you?', 'Because you don't have a cape.' Well I will make one' That was what drove him. ... He wanted to fit in with his peers. (COI/89)

As children approached turning five, they often became friends with others who would be at same school. Tom's friendship with Ben was not supported outside of kindergarten by their parents. Instead, encouraged by their parents, Tom became friendly with another boy. Caitlin had a close friendship with Gina and Harry. This had begun through their older brothers attending the same school, playing soccer together and the families becoming friends. This provided opportunities to develop working theories about the nature, importance and purposes of friendships as a source of special connection with people. Caitlin was the eldest of the three so initially was at morning kindergarten without Gina and Harry and often played alone. Once Gina and Harry also attended, group play in the family corner or collage/literacy areas was common. They shared a working theory that they would have a lifelong friendship because their families were already close (see appendix 14, p. 352).

The following findings illustrate that there are certain rites of passage that children are interested in as part of a fundamental inquiry into growing up. Children construct

working theories about these and test them out in relation to their peers as they learn about them. In the main, these funds of knowledge-based interests were recognised and supported by teachers in the curriculum.

Imogen, Safiya and another child who had recently acquired a new-born sibling, were on the tyre swing together. Imogen revealed that her current working theory of friendship also included friendships in babies.

Immy asks [Name] "Who your baby's best friend?" [Name] looks puzzled. Immy "Your baby, your baby come out of mummy's tummy." [Name] shakes her head "My baby come out of mummy's bottom." Immy laughs (tone of disbelief) "Yeah out of her bottom" (1K/168-169)

Here, both of Imogen's working theories about babies having friends and the process of childbirth were evidence of her place in her family and current knowledge.

Imogen's working theories will be revisited in future as she revises her understandings based on learning through peers' and other family experiences.

Among the toddlers, peers were an important source of learning about, gauging progress at, and theorising about, life's tasks related to growing up. Aidan progressed from eating in a highchair to eating at the table with older children during the year. His intent observation as he participated in meal times with them involved curiosity and concentration to absorb new information and act on it. Special relationships supported learning these "growing up" behaviours appropriately, coupled with investigation and inquiry into the next stage of development.

At both centres, turning five and going to school was another step in a child's life, something they were aware involved taking greater responsibility for oneself. Children demonstrated a range of understandings and theories about what going to school involved. Children commonly announced on their arrival at 1K or TK each day after, that they had been on school visits. Perhaps because of its status in children's lives, teachers always responded enthusiastically. Children were excited about the transition.

TK focused on children's transition approximately six weeks prior to school entry through provision of a work book with skills-based activities in it, including alphabet

recognition, number matching, writing one's name and address and identifying some favourite items. Children had varying levels of interest in these tasks and teachers did not compel children to undertake them, especially if they were already competent in early literacy and numeracy. 1K believed that no special preparation was necessary alongside the experiences provided every day. This was reinforced by feedback from the local primary school during the year about how well children who had come from 1K were learning. Further, with a smaller number of older children, it was likely that teachers were more aware of children's development of skills and knowledge related to successful transition, whereas TK perhaps felt the need for a system to ensure parental and societal expectations of the funds of knowledge of their larger number of "graduates" were achieved.

Children usually lose their first tooth around six years of age. To lose one earlier is of great interest to a number of children and enables access to novel information. Moreover, younger children already have knowledge of cultural explanations such as the "tooth fairy". In this example, a range of child and teacher everyday and conceptual knowledge is evident.

Leah's turn. "I went to the dentist. They took out my teeth." Christine asks how many and Leah holds up two fingers and then uses her index fingers to show the gap in her mouth. At this point, all the children move forward on the mat so that they can see. This is indeed fascinating news! Leah then shows the children her teeth in the jar. Christine takes them out and shows the children, commenting on the roots. She tells them that this is why she tells them to eat their yoghurt and cheese at lunchtime so they will get calcium to make their teeth strong. She asks what the red stuff is. Someone replies blood. Christine asks Leah if there was lots of blood. She says "no because there was a bubble" (misinterprets question?) Christine asks if she saw it all happen. Leah "no, he put me to sleep". ... Leah "Tonight I'm going to pop them under the pillow." Various children mention the tooth fairy. Christine ... puts the teeth back in the container and says that the children can look at them but are not to open the top. Leah adds "or to drop them". Louise points out that this was such interesting news that everyone moved up to listen and look. (TK/85 & 87)

Two common interests revealed and supported further aspects of fundamental inquiry. As noted earlier, 1K teachers noticed and responded to children's interest in caring for dolls, frequently provisioning the family area or making nappies from paper towels or

extending the play in other ways. As many were the youngest in their families, as with the four children in the doll washing extract in table 6.7, one source of this interest and inquiry into how to care for our youngest citizens came from observation and participation with older children. For example, Imogen frequently played with Meg in the family corner with dolls. The dramatic play excerpt of the four young girls illustrated acting on this experience, building knowledge and working theories with others, including a teacher, about bathing babies. As well as older children, these girls' own wider family experiences may have also influenced this particular fund of knowledge, as their spiral of knowing in this instance had reached the point of understanding that transforms into appropriate actions and responses with the support of alert and sensitive teachers.

Another shared interest among many children, influenced by peers, was animals and insects. This formed part of another fundamental inquiry into the natural, physical and material world. As Inagaki and Hatano (2002) point out, children use their knowledge about humans competently to guide both learning new information and the invention of additional pieces of information. Here, parallels with working theories and the information element of a spiral of knowing are apparent. Drawing on their knowledge about caring for babies and pets, their transformation of participation activities and initial working theories were firstly everyday concepts about looking after animals and insects, and not necessarily finding out scientific (conceptual) knowledge about them. The toddlers were fascinated by them, eschewing otherwise favourite activities and wanting to show them to as many people as possible. They frequently put them in plastic containers and gave them leaves as food.

As Immy digs, she finds something in the sandpit. It is a slug. With Barbara's help, she tries to put it on a leaf several times. All thoughts of cake baking have disappeared as she tries to do this. Several children come out of the art room calling to her that the lion hunt is on. But she perseveres trying to get the slug on the leaf. Eventually, she gives up and puts it in her hand and takes it to show Olivia who is painting. "Look what I found!" She goes into the art room holding the slug where about 10 children are doing the lion hunt. She shows it to Claire. ... [She] takes the slug to the table where she puts it on a piece of paper and draws around it. ... She takes it over to the red shelves and sits and plays with it. She tells Billie and Marcella who are watching that it is sleeping, then puts it on her finger to show them. She

takes it back inside and repeats the drawing around it activity she did earlier.
(1K/129)

This kind of response was not confined to toddlers, with young children acting similarly. At TK, Shannon found a spider in a tyre and made a "home" for it that met its survival needs. He avoided teachers' offers of conceptual information while working on the spider's home.

They show Christine who suggests that Louise find them the magnifying glass. Ben looks through it, then Shannon picks it up and takes it back to the collage area for more sellotape, saying to me "because it might escape". I ask him if he has looked through the magnifying glass. "No, not yet, as soon as I get the spider all done." ... He then goes to show the spider to Theresia again. Theresia asks him if they need more information about spiders as they have books on spiders at the kindergarten, but he tells me he now going to put some "wheels on it". ... Christine arrives with four books about spiders, but he is still going between the carpentry and the sellotape, thinking. He goes back outside and sits on the fort, then runs around the playground, periodically checking the spider in the container. ... Christine asks "what is he going to eat?" Shannon says that he put grass in there. Christine asks "how do you know if they like grass?" Shannon "I think he does". ... Christine "so do you think you should ... check the books?" (TK/12-14)

Chak (2007) claims children's curiosity and exploration are expressions of their eagerness to learn and can be utilised as motivation for knowledge construction. These data support Chak's argument, Inagaki and Hatano's (2002) notion of naïve biology and Vygotsky's (1978, 1986) notion that everyday concepts precede learning about scientific concepts. In relation to the spiral of knowing, the children are first learning about insects and animals in relation to their own everyday experiences related to their funds of knowledge. From this informal learning, when encouraged by teachers as in this extract, they will later gain information and learn related scientific concepts through access to books and in collaborative conversations with knowledgeable others. This will result in more sophisticated understandings, coherent bodies of knowledge and very likely different actions.

Teachers' interests, language, experiences

Each centre's teachers were another group of adults whose funds of knowledge influenced children's interests. At times, children repeated language they had heard frequently from teachers, but there were also other intangibles associated with influencing children's interests-related behaviours. These appeared to relate to teachers' philosophies, personalities and/or own childhood experiences. It was this category that led to exploration of teacher curriculum decision-making evidence, based on their own funds of knowledge, which is explored in the next chapter.

As is evident in all data, the teachers were very positive in their language and interactions with children, acting on their beliefs in children's capabilities. They often asked children genuine questions to promote their thinking skills and collaborative knowledge building. For example:

Christine talks with a group of children about her garden and the problem she is having with birds eating the tomatoes. She asks them "how can I guard my tomatoes?" The children make various suggestions. Christine responds positively "that's a good idea" "that's a good idea too". I hear "chase them" "make a trap".
(TK/6)

In this example, children draw on their funds of knowledge gained in other settings to theorise how Christine can solve this real problem. Wells (1999) suggested that an inquiry curriculum be built on children's questions, but also acknowledged clearly that the role of education is to stimulate new interests through teachers posing their own questions and problems, as Christine does here. The place of teacher interests in creating curriculum is raised later in this report.

As noted earlier, one of the systems in place at TK to ensure all children were assessed and planned for was children setting individual challenges, that is, teachers working with each child to self-assess strengths and abilities and set a new goal. Children were very aware of this focus, had learned what a challenge was, and used the word appropriately. Further, the notion provided opportunities to link home and centre learning opportunities, and potentially, funds of knowledge.

Tom's rope efforts have moved to the swing area. Christine has tied the rope through a tall eyelet, but Tom is the boss. Greta tells me "Helen, I'm learning to skip, that is my challenge", Tom "Well climbing is my challenge". He chooses who will have the

next turn, demonstrates and gives instructions about how to climb etc. To me "This is my plan climbing up the pole". He tells me that Christine helped him. "She said 'that's a good idea, that's a good idea'". (TK/38)

Children generally initiated working on their challenges themselves, as with Tom's rope climbing. This activity spread into others such as constructing a flying fox and rope climb, challenging teachers' abilities to enact planned curriculum and respond to all spontaneous requests, let alone document children's learning.

Christine notes that she needs someone like me recording all the time as this has exploded in four directions and "it wasn't on my agenda today!" (TK/38)

To encourage the interest further, and make a connection between centre and home, Christine talked to Tom's mother about taking Tom to a rocknasium in the holiday break.

[Tom's Mum] tells me ... his summary of his term's achievement was to draw a picture of himself as a mountaineer. (TK/41)

The next part of this analysis extends the concept of funds of knowledge further, from a sociocultural perspective, to include cultural events and other social and cultural experiences. The funds of knowledge gained from participating in these community settings formed further understandings that stimulated and extended children's learning in the four elements of a spiral of knowing.

Community-based funds of knowledge

Outside the family and centre settings, children participated in a range of social and cultural events. Some of these have been identified earlier, such as family holidays, dancing or swimming lessons and shopping opportunities, directly attributable to family capital. In addition, other types of events also occurred in the community. Where the centre was directly involved, certain funds of knowledge were recognised and extended. However, other experiences, and/or what children revealed in conversations that occurred during these events, were not always recognised and acted on.

Cultural events

Excursions that the centres engaged in provided opportunities to extend and develop funds of knowledge. TK had a full centre trip at least once each term, voted on by the

children and investigated for its suitability as a site of learning by the teachers. Choosing a venue and planning the excursion drew on some children's existing experience and knowledge from previous trips. Both everyday and conceptual learning was promoted. Butterfly Creek is a venue for trips that includes a tropical butterfly house.

Louise invites memory and recall about which place got the most votes (Butterfly Creek). She asks what that means. [Name] "that we are going there". Louise tells the group that Christine will go there soon to see what they will see and asks who has already been there. A few indicate that they have. "What will we learn about there?" "Butterflies". "What kinds of things?" "How they fly". ... Louise says she will write these things down so that "we can check our learning later". (TK/13)

On the trip, I took responsibility for Shannon. His dialogue with me on the bus journey there detailed below revealed much about his diverse interests and various funds of knowledge gained through his parents, including his previous trip to Butterfly Creek; and his eclectic current curiosity and mix of everyday and early conceptual knowledge about world and local geography, colour mixing, becoming literate, the cause of day and night, and moving house.

Table 6.8 Cultural events: A trip to Butterfly Creek

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
<p>Shannon sees the Sky Tower and tells me that "the biggest tower in the whole world is called CNN." He tells me the CNN tower is twice the size of the Sky Tower and then talks about the Harbour Bridge in San Francisco. (Who told you about the tower and the bridge?) "My dad told me. The CNN tower is in Canada". (Did your dad tell you that too or did you read about it?) "No I just know. My dad told me I can read on my own. ... See that? It's called Watchman Island, it's got a lighthouse on it and that's where a person sits. I can't wait till we get to Butterfly Creek. I know exactly where it is so that's why we have to sit in front. ... Butterfly Creek is red, the butterflies are lots of different colours, my favourite colours are red and green. Did you know blue and yellow together mix to green? What's that spring for?" (I explain about the two sections of the bus door opening and</p>	<ul style="list-style-type: none"> • literacy • mathematics • technology • moving house 	<ul style="list-style-type: none"> • everyday concepts of geography • early scientific concepts • communication • curiosity • thinking scientifically • thinking mathematically

<p>shutting.) ... "I'm using Mum's computer to write letters and print them out. But I'm not finished yet, I've got more to do." He lists the words he is writing, names, favourite foods, songs, Australia. "I know all about the different countries in the world." He talks about the sun and how at any one time half the world is in light and half the world is in dark "then the moon comes on to this side". I query whether it's the earth or the moon that moves. "It's the earth that spins around the sun, it takes 15 hours I think." I say maybe it takes 24 hours because that's how many hours there are in a day. He sees an aeroplane sign and tells the driver to turn left when he get to the next lights. ... A large truck goes past us and he speculates that it's a furniture truck with people moving from their old house to a new house. I point out the hydraulic hoist on the back and say that I'm not sure if you'd need that to move furniture. Shannon says that you said you do for heavy stuff and explains in some detail how you would use it to transport and lift heavy things, accompanied by various arm movements. "We're getting close." ... Christine praises his memory about where it is when he has only been there once before. (TK/32-33)</p>		
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Shannon was recognised as a child with deep and enduring interests, for example, in drains, dams and water supply and flow. He initiated experiences to practise and develop these funds of knowledge and was supported sensitively by teachers.

At 1K, only one full centre excursion occurred during the year, to Kelly Tarlton's Underwater World and Antarctic Adventure. Some children had been previously, and therefore had some prior knowledge. Jack talked knowledgeably about the travelator in the shark tunnel. During the trip, this again formed a focus of his interest and inquiry. For others, we did not know if they had been previously, but children who were usually energetic and high-spirited in their inquiries, such as Imogen, were focused, quietly absorbing everything around them, making the most of the experience to possibly create a first step in a new spiral of knowing. Instead of regular full centre trips, 1K frequently went for walks around the local area, such as to local school fields for physical activity beyond the confines of the centre's outdoor area (see appendix 6). They also took smaller numbers of children on trips such as taking the centre rabbit to the vet, going to the supermarket, or the garden centre. Although teachers did not articulate this as such, these trips complemented home and centre experiences and enabled children to develop their working theories about the

responsibilities and interests of adults, along with knowledge needed to be a positively contributing human member of a community and culture. The criterion for going on these trips was that the children attended full-time.

The knowledge and actions of medical practitioners, and observing or experiencing accidents, was a strong repeated theme in children's news topics. Such experiences showed a fundamental interest in physical and emotional well-being, another theme discussed in chapter eight. These provided opportunities to experience and develop new knowledge, and share or practise it in the centre context in order to extend understandings. The following data demonstrates how Jack's experience had led him to develop a faulty assumption in his working theory about ear infections, that I attempted to address, being aware of his thirst for conceptual knowledge.

The teachers in the infant area are talking to each other and to Ruth. Billie ... is also now holding her ear and saying it is sore. ... Jack has ... clearly heard and understood the conversation. He says to me "They need to take Billie to the doctor. There's a beeping thing that goes in your ear. It beeps in people's ears." (What does the beep mean? What does it tell you?) He thinks and then says "my ears are fixed!" (It's called a tympanometer or 'tymp' for short and tells the doctor if you might have trouble hearing things because of fluid in your ear.) (1K/87-88)

This topic was also referred to by children in their conversations and play in both centres. As the following example shows, children frequently used dramatic play as a medium to act on their understandings and working theories about doctors' responsibilities and actions.

Table 6.9 Cultural events: Medical knowledge

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
Amelia joins us and ... has a tiger with her and tells Immy it has a sore tail. I fold some paper and help them sellotape it around the tiger's tail. Immy "sore ear" and tears tiny pieces of paper to sellotape on the tiger's ear. She then says her doll has a sore tummy and starts to sellotape paper onto that too. ... She continues covering the doll with paper and sellotape telling me "She be all better soon." ... Amelia to Immy "We the doctors, eh?" (1K/179)	<ul style="list-style-type: none"> • health and well-being • caring for the sick 	<ul style="list-style-type: none"> • interest • involvement • collaboration • being a friend

Other cultural events and celebrations also demonstrated children's funds of knowledge about these. Children were particularly knowledgeable about regular events with ritual status such as birthday parties and farewells from the centre.

[Caitlin's 5th birthday/farewell] The ritual of lighting the candles on the playdough cake, singing the lighting candles song, singing happy birthday in English and Māori and then blowing out the candles happens. Louise asks Caitlin what happens next. Caitlin knows it's time to choose the claps and she chooses flying fairy claps Louise then picks up the portfolio "Here is Caitlin's portfolio, look how big it is because you have learned so much while you've been at kindergarten. What's the biggest thing you've learned while you've been here?" Caitlin "Playing with my friends on the swing and on my own." ... Louise tells the children what a neat thing a portfolio is to take home when they have left kindergarten. (TK/151-152)

Some cultural celebrations such as Chinese New Year and Diwali were acknowledged by teachers, while others, such as Valentine's Day, were not. For children, Halloween appeared to have been altered as a festival to acknowledge contemporary social and cultural context. Both Gina and Caitlin were simply using the occasion to dress up and obtain sweets from friends and neighbours willing to offer them and knew nothing of the festival's origins. No reference was made to it by the teachers. At 1K, there was dissension among teachers as to whether or not it should be recognised and become part of planning.

The teachers discuss Halloween planning for Monday - the costumes they will wear etc. ... When Angela asks Barbara what she will be wearing, Barbara says "nothing." Monday is her day off and she is happy about this as she doesn't think Halloween should be celebrated. (1K/197)

Perhaps Halloween had morphed into an example of popular culture, a category discussed shortly.

As another example in this section, the experience of participating in my research enabled children to develop new funds of knowledge as they inquired into the kinds of things that adults do. The full child participants came to know about research processes and tools, and developed working theories about my role and actions. As demonstrated in the data that follows, children particularly noted my notebook and pen, the writing of fieldnotes, and taking photographs.

Table 6.10 Cultural events: A researcher at the centre

<i>Data</i>	<i>Funds of knowledge identified</i>	<i>Dispositions or other sociocultural aspects of learning</i>
<p>Immy to me "I hold your pen?" I ask her if she would like the children's research book that Lucy had put down earlier. She sees it beside me and picks it up eagerly. She ... then sits beside me [on side of sandpit] saying "Your book, my book." ... Immy is still clicking the pen on and off and looking at it closely. I show her when the nib is down and she says "Oh!" She starts "writing" saying "Ronan's cooking, Billie's kicking." ... Imogen picks up the notebook and writes briefly. She picks up the notebook and tells Barbara "Helen gave us book." Barbara "Can you read it to me? What does it say?" Immy "It say let's take a photo." (1K/134-137)</p>	<ul style="list-style-type: none"> • literacy • adult responsibilities 	<ul style="list-style-type: none"> • interest • curiosity • involvement • collaboration • transformation of participation

At 1K, the toddlers understood that my purpose, role and activities were quite different to that of other adults in the centre, and enacted working theories about this as part of their own Friday routines. By the end of the fieldwork phase, the toddlers also had sufficient understanding to explain to their peers that I was different to a teacher and that they knew some personal information about me.

Excursions and other experiences offered in the centre setting supported funds of knowledge and inspired interests, but only full centre excursions appeared to draw on children's existing funds of knowledge in a planned fashion to co-construct curriculum and further inquiry. The next category involves funds of knowledge gained from a range of community settings.

Popular culture

Children's references to popular culture were the most numerous in the data. In conversations, children revealed these sources as including television programmes, movies, technology-based games and fast food restaurants. Popular culture provided a unique way for children to transform participation in activities. Specific examples related to boys' dramatic play at superheroes and the physical exuberances and skills involved. Their knowledge of characters, roles, vehicles, clothing and the rules of these games were consistent.

As noted in chapter five, close examination of the data revealed that children's interest in popular culture was not always about popular culture per se, but about the funds of knowledge-related actions, behaviours and values gleaned from popular culture and represented in their play, learning and relationships. These included risk taking, danger, good, evil and helping others. Popular culture in the form of varying artefacts provided opportunities to learn about physical and emotional well-being, identity and making sense of the world and people among other things. Testing out understandings and working theories about strength, roles, acceptability of social norms/rules, values and behaviours were commonly enacted through the use of popular culture as an element of play. Several families mentioned children's watching television and videos at home. For example during the family interview, Leah and Greta's mother spoke about the influence of television on play and language (including accents) used.

Leah and Greta's mother - It's usually ... imaginative games where they take on a character or they both have a toy and take on a character and they will set up a game and talk to each other, talk to the toy.

...

Helen - Dogs, do they play dogs sometimes?

Leah and Greta's mother - Yes, that seems to have become a big fantasy.

Leah - Yes, dogs.

Leah and Greta's mother - It kind of depends on what stimulus they've had recently.

Like if they've watched a video or something. (CFI/51)

Their imaginative, dramatic play at TK reflected acting on their understanding of family roles and responsibilities, testing out fears and risk taking dispositions. Alongside Inagaki and Hatano's (2002) explanations with regard to naïve biology, this also demonstrated a transformation of participation of what Corsaro (1985) described as innovative expansions of understandings that commonly occur with the use of animals.

They have set up pens with farm animals in them and also have zoo animals around the outside. They are ... role playing families. Greta "Mumma Mumma help me! Mum I'm hungry, what's for lunch?" Leah "... Look at me! Mum, the elephant is shaking me! Yeehaa! Help! Help! (Change of voice and tone to American accent) It's OK dear, it doesn't matter." She tells me that it is safe now and that it has jumped off into the playground away from the elephant. ... Leah moves to the puzzles, Greta

is still playing with the animals, lining up the small ones and calling Mumma Mumma again. I ask her what the animals are worried about. She says they are scared of the dogs. She and [Name] hide their animals in pens to escape from the dogs. "Quick quick!" Greta "I know what to do!" She puts them back on the head of the giraffe so that they are up high. Leah has returned and says (normal voice) "hey that gives me an idea!" and she hangs her animals off the elephant and begins to talk again with an American accent. "What's all the screaming my dear? What's all the screaming my son? I don't really like those dogs that came. Come with me then." She takes a horse instead over to the dog. "Hey big sister, why you come here? My babies are scared." The girls begin screaming. ... Leah "it's OK my son they've gone." They begin a new game with the sheep instead, but with a similar plot line and characters. (TK/66)

However, popular culture was a contested site of curriculum co-construction. Young children are exposed to a wide range of information and experiences. As they process these, they often transform them in ways adults view as inappropriate (Corsaro, 1985). Corsaro pointed out that adults often dismiss as unimportant what they do not agree with or understand about children's behaviour. At the centres, children's use of or reference to popular culture was viewed as an activity in itself, rather than representing an interest, and often deflected or diverted by teachers to affirm social mores as children tested boundaries. Certainly, this was more noticeable in relation to this activity than any other.

Christine approaches [Tom and his two friends] and asks about their construction. She talks to them about transformers that change capability. One tells her they are boomers. Christine asks what it booms out and he responds "poo". Christine "That'd be pretty messy, who's going to clean it up?" [Name] "the robot." Christine "Couldn't it boom out something more interesting, like chocolate?" The conversation then moves on [to other "boomers"]. (TK/103)

The primary way in which teachers used popular culture in their interactions in the fieldnotes was as motivation for the trips. These examples relate to the movie "Finding Nemo".

In the dining area, Vicky pretends to be on the telephone to Mr. Kelly Tarlton to give children their instructions about expectations. She also mentions that they might see

Nemo and Dory to much excitement. Parents also use this to reinforce expected behaviours here and at the venue. (1K/46)

Outside is an aquarium and Christine has asked the children to spot Nemo and Dory. Shannon spots Dory and points her out to me, [Name] helps him find Nemo at the other end of it. (TK/34)

Popular culture was, in some respects, undermined as a source of co-constructing curriculum reflective of children's interests, developing knowledge and working theories about human responsibilities and behaviours. Teachers noted this in the phase one data and later began to consider its potential for building curriculum (see Tom developing literacy using Ninja Turtles p. 191).

Children's working theories and spirals of knowing

This chapter has been structured around the funds of knowledge opportunities experienced in family, centre and community settings, their direct impact on children's interests, and whether or not teachers recognised and responded to these. Discussion has also provided examples of working theories and spirals of knowing to support existing literature on dispositions as process outcomes of early childhood education. Funds of knowledge are demonstrated in the working theories identifiable in the dialogue and actions of children as they engage with them in the context of a play-based environment. A focus on working theories and spirals of knowing provides a way to recognise children's learning processes and knowledge construction through funds of knowledge-based interests in their families, centres and communities. Examples, including those discussed in this chapter, are provided in table 6.11, with an extended version in appendix 14 (pp. 352-356).

Table 6.11 Examples of children's working theories and spirals of knowing

<p><i>Working theories</i> ... working theories contain a combination of knowledge about the world, skills and strategies, attitudes, and expectations ... (Ministry of Education, 1996, p. 44).</p>	<p>1. scientific properties of objects [Imogen] picks up another sponge and gets some bubbles from the rubber matting to clean the back of the bike again. She looks intently underneath at the sponge a few times. I ask her what she is looking at in she tells me "the bubbles. They go!" She repeats this again and then resumes cleaning and drying. (1K/150)</p> <p>2. human growth and development <i>i) birth of a human baby</i> Immy "Your baby, your baby come out of mummy's tummy." [Name] shakes her head "My baby come out of mummy's bottom." Immy laughs (tone of disbelief) "Yeah out of her bottom" (1K/168-169))</p> <p><i>ii) adult responsibilities</i> Tom: "You have to be 16 to drive." I ask him when he will be 16. "When I'm an adult. When I'm a big school boy and then when I'm finished I'll be an adult." (TK/22)</p>	<p>1. Imogen is developing a working theory about the properties of sponges and bubbles through her repeated actions. These kinds of everyday understandings are beginning working theories towards a scientific body of knowledge.</p> <p>2. i) Imogen has a working theory about where babies come from based on her experience (likely to have been supported by cultural explanations) that is not challenged by her peer's information as it is so discordant with her theory.</p> <p>ii) Tom has working theories about adult roles and responsibilities related to age, with consequent expectations.</p>
<p><i>Spirals of knowing</i></p> <ul style="list-style-type: none"> • experience • information • understanding through a process of knowledge building • action <p>(Wells, 1999)</p>	<p>1. Jack's mother - As a family we've got the boating interest. ... so Jack's very interested in the outboard motor on that. Helen - Did it need a new propeller recently? Jack's mother - Yeah we did have to take them in to be fixed actually and ... most recently with our yacht is it's come out of the water and so that's generated a whole lot of fun. He watched it coming out on the travel lift and then the straddle lift, transported and propped up, put on a truck, put Rawhiti on a truck didn't we Jack and took it to [Name's] place. (CFI/121-123)</p> <p>2. Immy "I make you coffee. You have coffee?" (Yes please.) Immy 'makes' coffee with lots of sand stirring and coffee machine/milk frothing noises. (1K/143)</p>	<p>2. Jack has developed knowledge about the parts of boats and boat maintenance through intent participation with his parents in a family interest, renovating a yacht. Through his involvement he has gradually learned more in a spiral fashion.</p> <p>2. Imogen's recent experience of going to a café, and information learned, is represented by changes to her usual pattern of making tea or coffee in the sandpit to include the café experience of machines that undertake this task.</p>

Summary and conclusions

Funds of knowledge are a particular form of family capital, represented and supported by experiences in early childhood centres and communities. A funds of knowledge interpretation of the present study's data demonstrates that children's interests and inquiries are stimulated by, and responsive to, the people, places and things in their families, centres and communities. Observing, participating in and representing these experiences allowed children to develop knowledge and dispositions in areas of interest and inquiry to them. Categories from the existing literature on funds of knowledge have been drawn on and extended, with eight new categories added to acknowledge the range of pedagogical relationships and other social and cultural experiences that children engage in that develop their funds of knowledge and working theories.

Exposure to a wide range of experiences built funds of knowledge. These provide a framework for recognising and responding to children's interests and inquiries as represented during their play and dialogue in an early childhood centre. The centre acts as a context for learning where they may observe, participate, practise and build on their knowledge (Vélez-Ibáñez & Greenberg, 2005) in reciprocal and responsive pedagogical relationships with peers and teachers. The importance of teachers recognising and responding to children's funds of knowledge-based interests is highlighted as a key argument for moving the sector towards a deeper understanding and interpretation of the term children's interests. Further, funds of knowledge are a form of everyday learning that can, at times, be used to support early conceptual understandings in young children.

Findings from across the different data sets identified ways in which working theories and spirals of knowing were stimulated and extended by experiences and information gained from people in social and cultural contexts. The four key elements of a spiral of knowing (Wells, 1999) were demonstrated through the data: experience, information, knowledge building and understanding. Yet, in the case of toddlers and young children these elements are not necessarily logical or building working theories systematically, demonstrating children's limited experience due to their age and maturity. Further, Claxton (1990) pointed out that humans collect many "different, piecemeal, purpose-built 'minitheories'" (p. 9) that are not coherent. Several examples

of each have been identified in the data about funds of knowledge and have been summarised in table 6.11.

The findings of the present study suggested that parents, other children and adults were significant pedagogues in children's lives, had funds of knowledge that children tapped into, and that these directly influenced their ongoing interests, inquiries and knowledge building. Yet, teachers' recognition and engagement with these was piecemeal because of the few opportunities to connect authentically with all families and the spontaneous nature of many learning and teaching interactions that some children tended to dominate.

For instance, examples that stood out were: Tom's, Caitlin's and Ben's relationships with their older sibling and the sophisticated language and play that resulted at home, none of which was enacted at TK; that both of Lucy and Billie's parents were musically talented, participating in choirs and playing musical instruments; that Jack's interests were strongly impacted on not only by his parents' leisure activities, but also by their sophisticated language used explaining these to him; and that children who had regular holidays, swimming pools or went on outings with their families were afforded different knowledge-building opportunities that revealed themselves in their play and interests. Children's relationships and experiences with their grandparents were overall the most significant aspect of the interviews that were not fully recognised at either centre. The potential of grandparents' activities to influence children's everyday and conceptual knowledge of science is illustrated by Ruby, Kenner, Jessel, Gregory and Arju (2007) in research on children's participation with grandparents in gardening.

After my interview with Jack and his mother (the last interview) I became critically aware of the importance of these experiences. While teachers articulated the importance of knowing these, they did not seem to be known in depth or documented, and rarely were they taken into account in extending the children or in curriculum planning. For example, although Billie's interest in music, dancing and shoes was identified and responded to, this was not linked to her funds of knowledge nor utilised in planning. Teachers were probably unaware of the link between music and singing and her parents' interests. Similarly, while Jack's home experiences were recognised,

those related to the boat were not drawn on and extended in 1K centre experiences. However, his advanced cognitive and language abilities were extended through purchasing new equipment such as cogs and junior engineer, and teachers spending one-to-one time conversing with him. While Caitlin's interest in cooking, art and sewing was identified, that this came from her experiences with her parents and grandparents went unrecognised in planning or documentation. Similarly, Leah and Greta's interest in animals was not linked to their home pets and experiences at their grandparents' beach house, although they frequently talked about these at the centre. In short, children's depth of prior knowledge and experience, encapsulated in funds of knowledge-based interests, was not fully capitalised on.

Teachers recognised and acted on some of these funds of knowledge-based interests and inquiries where they were aware of children's funds of knowledge and engaged with elements of a spiral of knowing. Where interests and inquiries were not recognised or extended appeared related to teachers being unaware of the connection to family and community experiences, the nature of the relationship with individual children, children's personalities and/or language skills, or constraints such as centre routines and priorities, group size or teacher-child ratios. A further influence on curriculum co-construction may have been teachers' knowledge, a matter that is explored in the next chapter.

Most significantly, teachers' understandings of children's interests as largely play-based, that is, activity-based, perhaps clouded recognition of deeper inquiries and the sources of these. A deeper understanding of play as pedagogy, as highlighted by E. Wood (2004) in her definition (see p. 11) that includes not only play environment provision but pedagogical knowledge to support or enhance learning through play, and Dockett and Fleer's (1999) definition of play as a meaningful activity, can be assisted by understanding of children's funds of knowledge. A funds of knowledge interpretation of children's interests and inquiries provides a framework for a deeper understanding of children's interests, something consistent with teachers' emphasis on knowing children in a meaningful and authentic way in order to provide a responsive inquiry-based curriculum.

Chapter seven

TEACHERS' FUNDS OF KNOWLEDGE

Teachers become more reflective practitioners when they recognise how their actions and decisions ... are grounded in the multiplicity of life experiences they bring to it (Yelland & Grieshaber, 2000, p. 1).

Christine - it was fascinating for me to watch my own personal and professional development because of the questions that you asked and the way I put it all together I can see how I have become the person that I have become. (COI/17)

Introduction

Throughout their lives, teachers' knowledge has been built incrementally in their own families, centres and communities. Building on teachers' professional knowledge during the research continued this learning process. The present study examined how children, teachers and a researcher might co-construct a community of inquiry investigating interests-based curriculum and pedagogy. This chapter specifically addresses the third and fourth sub-questions of the study:

- What professional knowledge do teachers use to assess and respond meaningfully to children's interests and inquiry and generate authentic teaching and learning programmes?
- How might a researcher utilise research partnerships to blur the boundaries between research, practice and professional learning?

Findings reveal the range of evidence types that informed teacher knowledge and decision-making about co-constructing a curriculum on children's interests.

In analysing data to interpret the third question, a range of formal and informal knowledge was apparent in the complexities of teacher action and decision-making. The literature that suggested teachers' personal and professional lives have a symbiotic relationship as teaching involves personal and professional investment (Day, 2004; Nieto et al., 2002) was influential in developing interpretation of teacher understanding and practice in the present study. This chapter argues that while engaging in curriculum decision-making and implementation, teachers drew primarily on funds of knowledge gained from their personal and professional experiences in their families and communities, supporting the notions of social, family and

community capital as central to learning. Further, consistent with Moll et al.'s (1992) notion that funds of knowledge are not static but dynamic, ways in which they are developed, enhanced and stimulated through participation in social and cultural activities are identified.

In the first part of this chapter the notion of funds of knowledge explains categories of teachers' informal knowledge. Extending Moll et al.'s definition, these form the bodies of knowledge (including information, skills and strategies), that underlie the functioning, development and well-being of teachers and learners in educational settings. Further, it is argued that funds of knowledge commonly complement, reinforce and filter formal knowledge in teachers' decision-making.

The second part of the chapter addresses ways participation in the research extended teacher knowledge and understanding. Much professional development for teachers in the past has adopted a transmission model of information sharing (e.g., see Falk, 2001; Liebermann & Miller, 2001; Little, 1999). Instead, drawing on the thinking of various writers (e.g., Buysse, Wesley & Able-Boone, 2001; Cullen, 2004; Timperley, 2004; Wells, 1999, 2001a, 2002), my model for professional learning was to co-construct a community of inquiry with the teachers for the purpose of improving practice. My aim was, in part, to have teachers create more coherent working theories with theoretical underpinnings that they could employ. This notion is supported by the concept of a spiral of knowing, and consistent with the ongoing improvement in teachers' working theories through action research spirals discussed by Haworth et al. (2006). Research data about the children's interests and inquiries triggered the teachers' reflective dialogue and inquiry, supported by my provocations, in a spiral manner.

Teachers' funds of knowledge

The contested nature of knowledge has become a source of wide debate (e.g., see Bereiter, 2002). Recent research evidence about the importance of professional knowledge and qualified teachers supports present policy moves in NZ to increase the number of qualified teachers in early childhood education (Ministry of Education, 2002). However, many teachers are likely to bring to their teaching practice a range of formal and informal knowledge and evidence that impact on their curriculum

decision-making and interpretation. Drawing on Claxton's (1990) thinking, this knowledge is likely to inform teachers' own implicit or working theories. Acting on working theories about constructing curriculum built on children's interests may rely on practical knowledge, rather than deeper understanding at a theoretical level. Claxton also notes that such practical or working knowledge often continues to influence decision-making, even after teachers have been exposed to and accepted some form of intellectual knowledge. The interplay of teachers' professional knowledge, whether the knowledge is formal or informal, demonstrated the complexity of evidence brought to teacher decision-making. Understanding teacher knowledge was especially significant because co-construction of interests-based curriculum most commonly occurred when children's and teachers' interests and knowledge coincided.

As discussed earlier, some researchers have recently developed the notion of teachers' funds of knowledge (Andrews et al., 2005; Gupta, 2006). The following interpretation extends these analyses further. In short, I consider the mix of informal knowledge that teachers bring to bear on curriculum decision-making. This is undertaken from a funds of knowledge perspective consistent with the notion that González et al. (2005) and Moll et al. (1992) applied to understanding children's learning, and my interpretation in the previous chapter that other social and cultural experiences can also be viewed as additional funds of knowledge.

These funds of knowledge interconnect in teacher decision making and are not mutually exclusive. Like the previous chapter, teachers' funds of knowledge are categorised in three ways: family-based funds of knowledge, centre-based funds of knowledge and community-based funds of knowledge. This analysis highlights, as with the children in chapter six, that parents form a key pedagogical relationship in which teachers access funds of knowledge. Further, people who teachers have worked with during their careers form centre-based pedagogical relationships and sources of funds of knowledge. Teachers' age, maturity and experience means they have been exposed to many more pedagogical relationships than children in their communities and, therefore unlike chapter six, this section has the most categories. All categories of teachers' funds of knowledge are derived from the data. The categories discussed are:

Family-based funds of knowledge:

- personal and family experiences
- relationships with children

Centre-based funds of knowledge:

- relationships with children
- teacher beliefs and values
- influential role models

Community-based funds of knowledge:

- teacher education influences
- professional learning programmes
- other study
- professional and academic reading
- networking

Family-based funds of knowledge

Personal and family experiences

The socio-historical impact of teachers' families' funds of knowledge was evident. As an example of a working theory, personal and professional qualities were identified by teachers as important to the way they recognised and responded to children's interests. Qualities and dispositions such as patience (Angela, Claire, Louise and Wendy), flexibility, spontaneity (Angela), empathy and ability to interpret body language (Barbara), being respectful, caring and trustworthy (Claire), and kindness (Wendy) were mentioned alongside others such as risk taking, being proactive and making the most of opportunities, having personal motivation (Christine), being a good listener and communicator with children and adults (Kylie and Louise), being passionate, enthusiastic and excited about teaching, having stamina and being reflective (Louise), being interested and open to new ideas, and having empathy and affinity with people from diverse backgrounds (Theresia). Those that each teacher identified were also evident in their practice, indicating congruence between working theories and action.

Two extracts of data are provided, followed by further findings about their influence on teachers in their curriculum provision.

Table 7.1 Personal and family experiences

<i>Interview data</i>	<i>Funds of knowledge identified in practice in fieldnotes</i>
<p>Angela - ... and my family and friends [have influenced me] too. Like Mum, she's very similar to the way I am, like very caring my Mum is and very understanding and things like that. I look at myself now and I do things that Mum would have done ... just different little values and Mum never really raised her voice. She's always really calm and understanding towards mistakes you might have made because we learn from them. (TI/3)</p>	<p>[Angela is at the playdough with Immy, Billie, Safiya and Marcella.] [Some playdough] falls on the floor and Immy stands on it accidentally. "Ooh, squashy squishy." She adds more to the dough pile and stamps and slides on it. ... She then gathers it into a big lump and stands on it again. She is excited to notice it squishing through her toes and tells me "slippery." Her feet then begin to slide from underneath her and she tells me with a huge grin "going on slide" ... Marcella has been watching all of this quite intently for a while. Billie now moves back to the collage table so Marcella uses this opportunity to get Billie's pile of dough, put it on the floor and stamps in it too. She also clearly enjoys the feel on her feet and the effects she can have on it. ... Safiya is now also standing on dough "Look at me Helen." It is becoming quite a mess and I am curious that the teachers have let it happen. They seem to let messy play go further than I would personally; they are much more accepting and relaxed about children's exploration. (1K/221)</p>
<p>Barbara - I used to take my kids walking through the forest and I think that comes through from my Dad as well. He used to know a lot of native trees and the names and it's like if we don't pass down that knowledge a lot of parents aren't interested in a lot of nature stuff, I am. (TI/26)</p>	<p>After Barbara has laid fresh paper and got fresh food for the mice, she suggests getting dandelion flowers for them to eat. I ask her how she knows they like these. She thinks and says she had mice when she was younger, she probably read it somewhere and the only fresh things they like are dandelion flowers and winter grass. (1K/171)</p> <p>They have rescued a baby bird [at home]. Barbara asks her if they are feeding it worms and [Name] says "bread with milk on it." Barbara says she will have to tell Mum not to do that as that will kill it. I ask her why and she tells me that birds can't drink milk, it gives them diarrhoea. I ask her how she knows all these things and she can't explain it - it's clearly personal life experience coupled with an interest in these things. (1K/195-196)</p>

Angela's values and practice were influenced by her mother's personal qualities and parenting style. In the first example, Angela's warm demeanour, patience and understanding helped children feel safe engaging in interests involving spontaneous exploration and messy play when she was responsible for them, particularly in the art room or sandpit. In the second example, Barbara's father stimulated her childhood interests and experiences in nature. These experiences provide funds of knowledge she acts on intuitively in her teaching alongside her formal knowledge of biology, a subject of interest, and her interest in nature and gardening. Louise also acknowledged her father's funds of knowledge as influencing her interest in art and music.

Further, similar to the children in the previous chapter, teachers recognised that they could access funds of knowledge related to their parents' occupations. Ruth's mother was a primary school teacher and Ruth accessed her for aspects such as conceptual knowledge of science that she could then bring to her teaching. In addition, the teachers' experiences with their siblings had also developed funds of knowledge. For both Claire and Vicky, funds of knowledge gained through looking after a much younger sibling had led directly to their career choice.

The data revealed clearly that teachers' personal interests and knowledge were as important a source of curriculum as children's. For example, both Angela and Vicky planned weddings and were married during the year. Neither teacher talked directly about this with children at first. The children initiated interest in this from overhearing adult conversations, a feature of Brennan's (2005, 2007) findings. It was likely that children also accessed knowledge about weddings from their own family funds of knowledge including asking questions of their parents.

Angela - ... they were able to share all their knowledge about what they knew about weddings. They knew that they had to have a ring, Lucy needed to have a bridesmaid, they insisted that she had to look beautiful and all this so it was really neat to be able go with ... things that happen in our lives as well. (TT/1K/7)

Curriculum documentation records how children combined their funds of knowledge and represented it through dramatic play, acting out Lucy "marrying" a boy at the centre. Acknowledging the relevance and importance of teacher interests as a source of curriculum was rare. This point will be returned to later.

Relationships with children

Relationships with children were also sources of funds of knowledge that impacted on practices. Teachers who were parents expressed that their experiences with their own children had influenced their careers and philosophies. For example:

Theresa - I've really wanted good things for my children I didn't want them to be glued to a TV box, I wanted them to experience nature ... so it was those kinds of things that made me interested in what they were interested in and through that interest it was like well okay, there's a niche here where I might be able to do some good (TI/107)

Wendy had become a parent in the previous year. This had altered her emphasis to developing warm relationships with children as a basis for building learning.

Wendy - ... my philosophy hasn't really changed but it's sort of been tweaked a little bit having Jaimée. ... [Now] my main focus is the nurturing of the child to begin with and then start doing all the learning after that because they need to have that solid base to begin with. ... just in the back of my mind now I'm always thinking as a parent as well as a teacher. It does change things around a little bit. (TI/137 & 139)

Centre-based funds of knowledge

Relationships with children

Teachers described how their funds of knowledge influenced their working theories and practices in relationships with children in early childhood settings.

Christine also tells me her personal theory about how children's physical skills come before academic skills. She considers that the physical skills build confidence to try something new. (TK/170)

This emphasis on physical skills was evident in an analysis of the children's challenges at TK. Teachers often appeared to steer children's challenges in the direction of fostering dispositions of risk taking through physical challenges, acting on their working theory that this would instil confidence for learning. In addition, the impact of Christine's travelling as a young woman influenced her emphasis on risk taking.

Christine - I mean amazing stories from when I was away. I learnt to hitch. I took appalling risks. (TI/35)

Vicky described how children's enthusiasm was vital in establishing and maintaining interests-based learning:

Vicky - ... [the children's] ideas and expectations and excitement because without their excitement towards a project or to learn they wouldn't be able to do that. (COI/134)

Projects were a way to develop and/or stimulate children's interests, and add to their funds of knowledge gained in other settings in a longer-term way. The following data follow the year-long project at TK to move the garden from outside to inside the kindergarten grounds so that children could be directly involved in the garden's development and use in authentic ways. Theresia led the project, likely because of

her interest in gardening and her collegial support of Louise. Both teachers wanted to use vegetables grown on site in their cooking with children. Teachers and children drew on various knowledge about design, plant biology, aesthetics and food preparation while participating in the project.

Theresa asks if she can interrupt [mat time] to tell them some exciting news. "We are going to make a new garden at kindergarten." She reviews the activities of last Friday with the children [children came up with designs] and talks about the plan for making a new garden in the shape of a cross. She tells them that it is not going to happen quickly but will be a big project. ... It has been very busy since I was last here! The garden project is well under way and documented in the display board near the entrance. ... Theresa has been out in the garden with [a girl] and pairs of scissors picking broccoli. The girl is particularly interested in this because she is growing peas in her own garden at home. They have picked the broccoli because part of their healthy heart work is about trying new foods and Theresa will have the children try the broccoli with a yogurt based dip at morning mat time. They are also going to make savoury muffins with silverbeet and feta cheese in them. ... Theresa now has a large group of children in the garden identifying vegetables and herbs and in particular looking for silverbeet. She comments "someone's been nibbling our silverbeet." The children suggest snails or Ebony [kindergarten rabbit]. ... Some children come past with a plate of cut strawberries from the kindergarten garden. Harry tries one and tells Louise they are very sweet. Louise had brought in some tulle which has been placed over the strawberry plants to protect them from the birds and they are getting a good crop. ... The scarecrow [made by Theresa and the children] is now up in the garden. A child comes to tell me this and we go out and take photos of it together. I compliment Theresa on it and she comments that it's great because it's all the children's own ideas and own work. She is delighted that the project is now into its third term as different ideas evolve and particularly pleased that the children are able to pick vegetables and fruit from it now it is on this side of the fence. (TK/46, 49, 51, 147, 149, 157 + photos)

The variable and unpredictable nature of children's changing interests often called on teachers' ability as learners themselves, to seek knowledge outside their current understandings to support children in their learning. In particular, where teachers had strong relationships with children, shared inquiry and dialogue led to co-construction of conceptual knowledge. Christine expressed this clearly with examples.

Christine - ... A teacher's knowledge might only be at a certain level but because the interest will come from the children, I will tap into the knowledge that I have at whatever level that is, then go away, provide more information via the books, reading the books to stimulate the interest, my knowledge also grows and that's valuable for both of us. We both benefit and the children who love facts, [the more] facts I can give them the more exciting it is for them and the more exciting it is for us because it always comes back again somewhere else. You get the wonderful vocabulary, the wonderful language, the wonderful discussions. (TI/45)

Responding to children's interests and inquiries was the strongest way in which teachers built conceptual knowledge, through accessing cultural artefacts, as a source of knowledge to then bring back to the educational setting. One example of a child's interest in Pompeii illustrated how his interest was first stimulated by the teachers' poster display of volcanoes. His initial knowledge came from talking with his grandmother about her experience of visiting Pompeii, sharing this with Christine who had also been there, and teachers extending this interest in various curriculum activities that included building children's conceptual learning.

[Based on their inquiry, children have been exposed to a model of a volcano.]
Afterwards, the teachers discuss which types of rocks are in a volcano. Louise ... says they are igneous rocks as those rocks have holes for gases. Theresia says she covered this in a course for her degree and has the information at home. Christine tells ... the student teacher that was good that she used words like magma as "we use those kinds of words all the time." (TK/143)

Teacher beliefs and values

Teacher beliefs about education are well-established in the literature as a powerful basis of teacher decision-making and action (e.g., Raths, 2001), and can also be viewed as working theories that influence practice. They are highly likely to have been influenced by personal experiences and family funds of knowledge, but because they are operationalised in negotiation with other teachers within the educational setting they are categorised as a centre-based fund of knowledge for the purposes of the present study. A broad perspective of beliefs is not analysed here; the focus is on teacher beliefs with regard to children's interests. Teacher beliefs that children's interests primarily corresponded with play choices was established in chapter six. Other beliefs related to children's interests that impacted on the curriculum included

that children's interests were used to encourage perceived "gaps", or extend learning into other areas, rather than extend or encourage the interest per se. The dominance of literacy and numeracy as culturally-valued funds of knowledge to be extended was evident in teacher thinking.

[Boy's name] with his dinosaurs, we used it to introduce millions of other things you know, literacy, numeracy, just so many different, like tactile things. (Ruth/TI/95)

Theresia - ... we'll say okay for this child because we know them so well, here is the big grey area, ... so for me then, using the child's centre of interest to build the curriculum for them is I'm going to use what you're interested in to build this whole. ... The interest is the vehicle then to make the learning happen. (COI/10-11)

In this way, Tom's interest in Ninja Turtles was used to extend him into literacy as a valued fund of knowledge.

Theresia tells me they made a book last week - they drew lots of Ninja Turtles pictures, told a story which they wrote and spiral-bound it. They each took it home to read with their parents. (TK/116)

This potential and the value of an interests-based approach were recognised by some parents in the study too. For example, Tom's mother stated:

I mean you can see what's come out of it for him Early literacy, early numeracy, all those little beginning skills which are all happening in lots of different ways ... you know he'll play a game, they sort of direct them to things or there'll be an opportunity for this and then someone will start counting whatever [T]hat is exactly what I wanted from kindy, an opportunity for him to drive his passion but learn through it because that's how they learn isn't it, they're more likely to learn if it's doing something they really like (CFI/20)

Similar to the parents, teachers expressed a belief in the importance of literacy and acted on this regularly in their curriculum planning. The examples here relate to 1K's infants and toddlers; there were also many examples related to the older children in both centres.

Angela -... babies always love books. We got them to bring a book in from home and from there we noticed that most of the children and babies brought in books about animals and so now we've looked at a few more things like that. (COI/9)

Well I love reading and I love stories. I've always got my book bag down there.
(Wendy/TI/140)

Extending children's learning in meaningful contexts and purposeful joint activity is an important role for teachers, to take advantage of opportunities to assist children to develop the tools and practices of their culture (Wells, 1999). Literacy and numeracy are both culturally-valued funds of knowledge and ways in which other conceptual knowledge can be accessed.

Influential role models

Funds of knowledge develop in significant social relationships. Each teacher talked about at least one adult who had an important influence on her, often through the teacher learning through observation and intent participation.

Christine - ... I learnt a lot from her. I just learnt by watching and listening to her interact with children. (TI/33)

Accessing other people's funds of knowledge, such as teaching philosophies, approaches and methods, practical experience and advice, impacted on and reinforced teachers' working theories. One group of influential role models were other teachers and team members. These influential role models can be regarded as providing guidance for authority-based practice (A. Jones, 2005; Schoonmaker & Ryan, 1996), a term used by these authors to contrast with evidence-based practice.

Another group of people mentioned were peers and/or lecturers/tutors that had been part of their teacher education. Sometimes their name had been forgotten, but the legacy of the influence had carried on in the teacher's philosophy and practice. For example:

Angela – [Name] was very inspiring as well and she started me off with that whole importance of the love that children [need to] have ... and not putting them down for mistakes that they make, being understanding for those things as well (TI/4)

Angela's comment was also congruent with the influence of her mother discussed earlier. Consideration of role models and their influence on teachers' funds of knowledge leads to the third category. Here, as a result of teachers' age, maturity and experience, they have been exposed to funds of knowledge through participation in various learning communities.

Community-based funds of knowledge

Teacher education influences

Christine, Claire and Wendy had moved directly from secondary school to teacher education to teaching and Theresia studied as a mature student to gain a qualification prior to teaching; the others had some form of early childhood working experience for a few years before or while studying. For these six, it is possible that this kind of professional journey highlights the role of practical professional knowledge and implicit (working) theories as guiding teaching practice. In a somewhat piecemeal fashion, consistent with Claxton's (1990) notion of unconnected minitheories, connections were made with teacher education knowledge commonly when it was in keeping with informal knowledge, as will be demonstrated shortly.

It could be argued that only one (Louise) of these six teachers had engaged in a coherent three year programme of teacher education with one provider. At the first group inquiry meeting, Louise identified her qualification as the most significant influence on her teacher development.

Louise - ... The first one was completing my Bachelor of Education (Teaching) ... I believe that these three years set a firm foundation of my philosophy, values and beliefs of my role as a teacher and I gained both knowledge and understanding within the curriculum areas as well as learning about professional and political influences on teaching and learning. I felt extremely confident and capable taking on my first teaching position when I left. (COI/1)

Similarly, Kylie acknowledged the influence of her initial teacher education diploma and subsequent study to obtain a degree qualification in developing necessary dispositions. Kylie's diploma provider had a strong bicultural emphasis; she developed a strong fund of knowledge that influenced both the interests and experiences that she initiated with children, and her own ongoing development where she expressed a wish to study Māori language.

While other teachers acknowledged some learning from their studies, none were as enthusiastic about their provider or study as Louise or Kylie. Vicky was currently studying part-time towards a degree qualification and was ambivalent about the

learning. For example, she raised an interesting point about the process of learning related to teacher interests as opposed to the need to "pass" papers.

Vicky - Trying to study for that exam a couple of weeks ago I would go off on other tangents looking at other things that I was really interested [in] and which meant more to my learning than anything else ... (COI/3)

The complexity of teacher education's role and methods in providing access to formal knowledge consistent with teacher interests and funds of knowledge, for teachers to draw on in their curriculum decision-making, is highlighted by her comment.

In their individual interviews, teacher knowledge of theory gained during teacher education largely reflected the claim of Anning, Cullen and Fleer (2004): "the maxim that 'children learn through play' constitutes a pedagogical given in early years settings that have been influenced by developmental, play-based curriculum philosophies" (p. 17). As at 2005, only half of NZ early childhood teacher education providers made explicit reference to sociocultural theory as a foundation for studies of curriculum and pedagogy (Kane, 2005). The dominance of developmental theory in understanding children is illustrated in the following data, including from Claire, the most recent graduate.

Barbara - It just goes back to your training, knowledge of developmental stages and how children develop. (TI/23)

Claire - Professionally I think you need to ... know some of the theory stuff

Helen - Which theorists are you thinking of?

Claire - Well I'm not very good with my theorists but the only ones I can [recognise are] Piaget and Bronfenbrenner, I'm not very good with them but you can see when you're writing down a learning story where that links ... and it sort of helps you with your planning (TI/50)

Ruth - You need a sound theory base ... because that underpins everything else. I think that's really, really important.

Helen - Any particular theories you think are important?

Ruth - Well I've always [thought] especially when they're babies and I often tell parents and I think it's a really, really big thing in life is Erikson's theories of like the trust versus mistrust. (TI/92-93)

The theories mentioned by the teachers were not only mostly developmental, but those that gelled with their philosophy and practice; an indication that formal knowledge is filtered through informal funds of knowledge such as teacher beliefs. Understanding of sociocultural theory was less prevalent among the teachers. It is likely this reflected, in part, the teacher education programme each had experienced and recent changes in theoretical emphases.

Theresia - Well current knowledge I think just how the different theories change. We learnt all [about] Piaget and [others] ... now they're all talking about socio-cultures and cultures of places ... I think if you don't keep up with those, it doesn't support your work as a teacher in different ways. (TI/109)

Shortly afterwards, Theresia also made a significant reference to understanding the zone of proximal development from Vygotsky's theory as crucial to appropriate interests-based pedagogy.

Vygotsky says zones of proximal development doesn't he and if you're not working in that phase you're actually wasting your time because the kid's not going to take anything on board then so to me children's interests are within that zone of proximal development and you know when you hit that on the button because they just fly. They just fly. It's amazing whereas when you don't hit it, it's very flat so then you have to reassess why and how and you go off and you do it all over again. (Theresia/TI/111)

Such understanding was rarely articulated in the first phase of the study. Keeping up-to-date with the theoretical changes that have permeated early childhood over the past ten years presents a challenge for teachers and teacher educators if understandings about children's learning are to shift from an uncomplicated "developmental play-based learning environment" notion and represent more complex ideas about children's interests, based on sociocultural theory, that writers such as Cullen (2003) have identified is necessary to implement *Te Whāriki*.

A culture of reflection and inquiry and an improvement-orientation were evident in both centres; therefore, in both centres teachers could be viewed as already engaging in spirals of knowing. However this was fostered more at TK because of the non-contact time that teachers had without children present. Certainly, as team leader of those teaching children over two years old at 1K, Kylie became frustrated at times with some of her team who did not undertake what she viewed as professional

responsibilities, such as child assessment, partly because of inconsistent non-contact time available, dependent often on relief staffing requirements. Without external input, understanding of sociocultural theory may not have progressed far.

Professional learning programmes

Professional learning programmes, including workshops and conferences, had by far the most data coded to it. It was probably the most prevalent way in which the teachers gained new practical knowledge, and/or reviewed their teaching and learning practices, congruent with their current working theories. Each event participated in added to their funds of knowledge and working theories. Participating in my project was another step in professional learning for both centres that continued the journeys they had already begun in the previous few years.

Christine - ... we have a history of doing that. This stuff is not fly by night, it hasn't happened just because you've been here, your coming in has added value to what we already have in place, it hasn't created it. (COI/147-148)

For TK, participating in a two-year long programme of professional learning through the Educational Leadership Project (see p. 67) had challenged them and supported and enhanced their practice, developing their focus on involving children in their own assessment and planning, through identification of challenges and teaching children questioning techniques. 1K had one year with the Educational Leadership Project, but this had mixed success because the focus of the programme was on learning stories, not information and communications technologies, which was what the centre wanted at that time. In 2004 they chose to work with another provider in a year-long programme focused on improving children's assessment portfolios.

Ruth - then last year we fine tuned ... our portfolio systems ... I think if you look through any of their portfolios you should be able to pick up their interests straight away (TI/100)

1K was particularly attracted to participate in my project because of a key feature.

Discussion about previous PD [professional development] occurs. Staff comment that programmes have not allowed PD advisor to spend time in centre seeing what goes on and that is an attractive feature of this project. Have received positive feedback/pat on back from PD about planning but been looking for (supported) challenges from someone who has actually spent time in the centre. (1K/1)

The importance of someone spending extended time with them first, who got to know their context and practice, including the children and families, was an inviting element, and is uncommon in government-funded projects due to time and financial constraints.

Consistent with the literature (e.g., Falk, 2001; Helderbran & Fennimore, 2004), few teachers talked about any value in short workshop-type professional development sessions. These seemed to them low-level, piecemeal and were perhaps evidence of minitheories that, for the teachers, lacked coherence or links to centre practices. Further, if only one team member had attended, implementing change and improvement was difficult. The most important thing about the value of a short course seemed to be related to its potential application to current centre goals or priorities and to use the information to contextualise to the centre. In other words, the content and context needed to be relevant to a particular aspect of practice within a relevant spiral of knowing at that time.

Christine commented that they attend lots of professional development and usefully adapt ideas learned to their context, thinking "we can do it better". The theme of contextualising research knowledge and/or generating own knowledge is common in the research-practice literature (e.g., DETYA, 2000; Hemsley-Brown & Sharp, 2003). (TK/2/analytic note)

Personal self-motivation was vital to the value of any professional learning, including research participation, in informing, changing and updating formal or informal knowledge.

Kylie - When you're a teacher it's an ongoing top-up educational thing. ... And because that's changing as well ... you've got to keep up with it. (TI/61)

Theresa - ... making the most of professional development. ... our world is changing so much and it's ... been a real privilege and a pleasure to tap into all these courses or lectures, or visitors that have come or get to conferences. It's all that feeding your mind and keeping your interest going, extending yourself and ... I see it as a spiral (COI/5)

Again however, it was notable that much of this professional learning and actions emanating from it was related to the play and learning environment. Teachers' focus

on this continued in phase two. I argue that teachers' recognition of children's interests as largely play-based (i.e., activity-based) often clouded recognition of deeper interests and inquiry. Children's funds of knowledge form a coherent framework that may enable teachers to be responsive to authentic interests and inquiries, which could be supported by different emphases within the curriculum. This point was picked up on during the co-constructed group inquiry sessions.

Other study

Teachers' general education formed another source of knowledge drawn on frequently in their everyday interests-based interactions with children. Here the nexus between formal knowledge, beliefs and teacher interests was most obvious. For example, teachers' secondary qualifications commonly influenced the areas in which their conceptual knowledge was strongest. As noted, Barbara's interest and knowledge of animals and insects was extensive and had been influenced by her own childhood experiences and study of biology. Her interests were informed by knowledge of biology but complemented and filtered by her beliefs.

I love nature and things. ... I'm really passionate about kids knowing the process of how things happen in nature and why things happen in nature. Everything from puppies to a big dog to the cicadas out on the trees, why they're singing. You know to the bumble bees on the flowers ... because the kids watch the bumble bees on the flowers and the bumble bees are doing a job (Barbara/TI/26)

Furthermore, an important finding was that children's interests and inquiries were noticed and responded to in co-constructing curriculum when they coincided with teachers and/or teachers had the knowledge to support them. Continuing with the example of Barbara, in the following extract, Imogen wants a caterpillar.

Barbara points out aphids but Immy is not interested. "Look caterpillar!" Immy says but it is a small snail. [Barbara] tells Immy to look for leaves that have holes in them where the caterpillar might have been eating. She points out another snail hiding under a leaf so the birds can't find it and get it. Barbara gets it and puts it in the container for her. Immy "two". Barbara "Look really hard, I see caterpillar poo so there must be a caterpillar here somewhere." Immy leans close into the garden and looks hard. ... They look in the garden and Barbara says she can see more caterpillar poos or is it snail poos? I ask what's the difference and she says caterpillar poos are darker, black. Barbara picks off a green tomato with a hole in it and shows it to

Immy, explaining that she thinks a caterpillar has had dinner there. Immy takes it from her and puts it in the garden saying to me "caterpillar hungry". (1K/69)

In relation to tertiary study, Ruth had begun a BA in Education and Psychology before deciding on her career. Similarly to Barbara, her studies informed and complemented her beliefs and working theories of early childhood philosophy and practice in various ways.

Ruth - I think right from the history of humans, children have learnt like the whole thing about the village raising a child and being with their parents and close relatives and I think all early education should be as much like that as possible I think all we need to do is work on kids' self-esteem until then and you're right. They can manage everything else in life. (TI/89-90)

1K valued a family-like atmosphere for children from its location in a converted villa, children's ability to move freely through the centre, (including through the kitchen and laundry areas), through to the genuine affection teachers had for the children and the ways in which children and families were responded to. Ruth's ideas link well to Bronfenbrenner's ecological theories, as well as funds of knowledge, as a conceptual framework to describe children's learning through intent participation in their communities and cultures.

On return from travel overseas, Christine looked to broaden her qualifications and described the effect of ongoing study on her dispositions towards learning and life. It was noted in the literature review that in order for children and adults to engage in inquiry, not just the disposition to inquire is important, but others such as involvement, enthusiasm, communication and collaboration are needed.

Christine - ... I love study. I love the learning. I love the way it charges up my brain. I love being around like minded people. I love being around positive people and again I learnt a lot. ... I know how study impacts and changes people's lives. (TI/37)

Christine was still in the process of completing her degree qualification. Kylie had completed three qualifications, and was considering postgraduate study, as were Louise and Ruth. Further formal study enables access to both current and diverse knowledge and provides stimulus to motivate teacher thinking and changes to

practice. Of relevance to the present study, it also provided children with enthusiastic models for inquiry learning based on individual and collective interests.

Professional and academic reading

Further knowledge is contained in the artefacts of academic and professional literature. For these teachers, this required an applied focus to be considered valuable. Both centres subscribed to NZ, but not international, publications.

Christine - ... I find when I read overseas articles they don't relate to what we're doing and I think there needs to be more research within NZ. It has more relevance to us. (COI/129)

Christine's comment echoes Claxton's (1990) idea that teachers' practical orientations dominate their thinking. Access to professional literature came in various ways, supported by management in both centres. Ways in which research-oriented theoretical understandings, to support practical orientations, were strengthened through readings provided during phase two of the study are described later in this chapter.

Networking

Other early childhood centres form sources of funds of knowledge for teachers to access. Networking with other centres occurred in a number of ways, not just through organised visits to another centre. For example, some teachers had qualified through a field-based programme, so undertaking practicum in other settings and accessing their funds of knowledge about assessment, planning and evaluation, could be considered networking.

Professional development courses were also a source of networking with other teachers.

Kylie - ... any course is better than nothing I think because when you go on these courses you get to network as well, so even if the course was a bit of a flop you can meet a few people and get some new ideas or new contacts. (TI/62)

For 1K, as a private centre, the opportunity to network with a kindergarten was an inviting, unique, feature of this project. The area of greatest networking of the project was the learning environment. A focus on change and improvement to the resources

and equipment of a play-based learning environment was prominent in both centres. 1K also enjoyed seeing the way TK documented children's learning and Kylie incorporated some of these ideas in her development of this aspect, highlighting the importance of practical knowledge to busy teachers.

Kylie tells me that she and Angela, followed by Vicky and Wendy, visited TK yesterday. Over the morning, I hear more about this. Each pair stayed for over an hour, Christine talked to them about the planning and documentation and Kylie took notes and photos to consider for their work. (1K/118)

TK were perhaps not as open to learning through networking with 1K, and could have reflected more on their relative capacities to be spontaneous with children's interests. Both centres prioritised routines within the daily programme, although these did not constitute teachers' interpretation of curriculum in the way that Nuttall (2004) found in her case study of an early education and care centre. Perhaps the greater number of teachers at 1K and the lower ratio (in practice this was commonly one teacher to three-or-four children on a Friday as opposed to TK's commonly being 1:13) meant that, although one teacher at least was usually involved in feeding or changing an infant, 1K was the centre that was most responsive and spontaneous with children's interests each day. TK appeared to use the routine of mat times in part to manage the number of children and the flow and activities of each session, although there was the flexibility to not have the mid-session gathering if children were judged as engrossed and productive.

The first part of this chapter has identified funds of knowledge that influence teacher curriculum decision-making and practices. From a sociocultural perspective these emanate from a variety of life experiences as members of families and communities, including the early childhood education community. Discussion has highlighted the somewhat personal and idiosyncratic nature of teachers' personal and professional knowledge through an analysis of the interplay of facets of formal and informal knowledge that teachers draw on to inform their actions. Findings identified that teachers draw on a range of evidence and that a funds of knowledge perspective identifies some of the deep-seated, influential people, ideas and bodies of knowledge that teachers utilise in their everyday practice.

In particular, the examples throughout the chapter of Barbara's funds of knowledge in relation to children's explorations of the natural world demonstrate that these are not discrete, and complex in the way that they inform and influence teachers' working theories and their interactions with children. The relationship between formal knowledge, funds of knowledge and teacher interests is multifaceted, and unlikely to be explained by a narrow definition of evidence-based practice. The next part of the chapter expands on ways in which participation in the research developed teacher knowledge including through my role as a critical friend, bringing together concepts central to co-constructing a community of inquiry.

Blurring the boundaries between research, practice and professional learning

Given the personal, evidence-informed nature of teacher knowledge, ways in which teachers may be encouraged to confront and re-form their knowledge and practice to take account of contemporary theory and research, are important to consider alongside notions of evidence-based practice and evidence-informed inquiry. Undertaking collaborative knowledge building, forming a community of inquiry, reintroduces the notion of shared or distributed cognition (Salomon, 1993). The dialogue between the teachers and me relied on strong evidence of children's learning from curriculum documentation and fieldwork data, as well as relevant theory and research evidence. Therefore, this part of this chapter also addresses the central research question of the present study: *How might teachers, children and a researcher co-construct a community of inquiry in early childhood education?* To support this discussion, a metaphor central to a community of inquiry is briefly revisited in relation to teacher learning.

Wells (1999, 2001b) describes a spiral of knowing as being central to an inquiry oriented curriculum. This spiral begins with experience (here the teachers' experience), adds information gained (in this case the research data throughout the year and the professional learning programme in phase two) that contributes to understanding, through a process of collaborative knowledge building (here between teachers from two different centres and me as the researcher/critical friend during dialogue). The outcome of knowing is action, represented in changes made to teaching practices and documentation. Consistent with the spiral of knowing metaphor, the desired outcome of the group inquiry of phase two of the study was to

encourage teacher action in order to strengthen and enhance children's and teachers' experiences and understandings.

Connecting research, practice and professional learning

As noted earlier, many parties advocate closer links between research and teaching practice; yet an evidence-based approach may be inappropriate for education because it may be too narrow in relation to the types of evidence teachers draw upon. Thomas (2004) raised the difference between evidence-based and evidence-informed practice, noting the latter allows for a wider range of evidence to be included, including evidence that comes from inquiring into practice. Thomas' view appears consistent with a funds of knowledge framework to describe teacher knowledge and evidence.

During the evidence-informed inquiry phase of the present study, two key types of research evidence were drawn on for discussion: data from this study and research-based literature. However, these two types of evidence were neither sufficient nor broad enough to explain teachers' thinking, decision-making and collaborative inquiry. The complexity of their practice, actions, reflection and discussion demonstrated that a range of types of evidence inform teacher decision-making and actions. This evidence included teachers' working theories (Claxton, 1990; Haworth et al., 2006) and demonstrated the potential of Wells' (1999, 2001b) metaphor of a spiral of knowing, culminating in changes to teaching practices and curriculum documentation, as being ongoing goals of refining teacher practice. An evidence-informed approach suggests that evidence such as teacher life experience, that is not strictly research-based, legitimately enters into educational decision-making within professional practice (Pring, 2004). In short, evidence-informed inquiry could be viewed as reflecting teachers' funds of knowledge gained from their own life experiences in their families, centres and communities, alongside research evidence that aligns with this informal knowledge.

An additional source of knowledge was participation in the research itself; therefore ways in which the research sought to challenge and extend teacher understanding by blurring the boundaries between research, practice and professional learning are now described. Findings demonstrate that teachers' funds of knowledge are not static, and

like the children's in the previous chapter, are subject to change when new experiences and information are added.

Helterbran and Fennimore (2004) note teacher involvement in determining professional activities is important if practice to be transformed. Further, professional learning is a long-term process, not an event. Theory is an important component of seminal models of teacher knowledge (W. Carr & Kemmis, 1986; Shulman, 1986; Wilson, Shulman & Richert, 1987), but was not mentioned by the conclusion of the first inquiry group session when teachers had nominated areas and questions of shared interest to form the topics of the future sessions. I asked that theory be part of what we addressed. Vicky responded "as long as it's relevant" (COI/44), a challenge I took up throughout phase two. As noted in chapter five, from examining the data, the teachers chose five topics for their professional learning/inquiry discussions, giving them a sense of ownership of this aspect of the research. These topics were: learning environment; interactions with children/listening/dialogue; assessment/documentation; planning/projects; and teacher development/professional portfolios. Data from these sessions are presented throughout the following section.

Approaches to boundary blurring

A. Edwards (2004) argued that researchers need to plan for interactions between research and practice from the outset of a project in order to disseminate findings in useful ways to multiple audiences. McIntyre (2005) suggested three ways to bridge the gap between research and practice. The first is trialling research-based suggestions in their contexts of practice; the second, designing research studies specifically with bridging the gap between research and practice in mind; and the third, teachers engaging in research activity themselves. All of these occurred to some extent in the present study. Several ways in which I acted as a critical friend to blur the boundaries between research, practice and professional learning were identified in the data. These drew on, challenged and extended teachers' funds of knowledge and working theories. They were:

- research participation
- provision of data for teacher reflection
- use of data as evidence to inquire into and shift practices

- research-based practices to trial
- provision of readings (and accompanying focus questions)

The first category is evidence of the ways that teachers' observation and intent participation raised consciousness of the topic of study and the processes of research. The next four form a continuum from individual teacher reflection to shared reflection and inquiry to externally facilitated inquiry. This continuum will be discussed further in chapter eight. Each category of findings is now described.

Research participation

The first way boundaries were blurred was that, as with the children, the teachers learned from the processes and tools of research. For example, the interviews helped them articulate their beliefs and practices about children's interests, contributing to a willingness to reflect on these and look at possible changes during phase two.

Both centres were oriented towards improvement in terms of their curriculum and pedagogy. Participation in this project assisted that goal. For example, for 1K, the realisation of the emphasis they placed on the learning environment encouraged them to make further changes related to interests they noted in the data that coincided with their knowledge of children's interests, and later to employ consultants to plan a new outdoor environment for the children.

My analysis of whose and which interests created curriculum had identified that in practice, teachers' interests contributed many of the experiences provided, but that these were less frequently documented than children's self-initiated interests that were in their portfolios, even when the teachers had successfully stimulated children's interests. For instance, Kylie and Louise were both interested in te reo and tikanga Māori (Māori language and culture) and brought this into the curriculum without it being initiated by children, particularly at mat time. Yet, this was rarely documented in children's portfolios as the interest was deemed to be teacher-centred.

Kylie is going to read them the New Zealand version of the 12 days of Christmas. ... Kylie makes connections between the pages and other things that the children are familiar with, for example, suggesting that Kahu the cautious kiwi would enjoy eating the huhu grubs. When Kylie asks what the eels are, Billie suggests whales. Kylie

says they saw some at Kelly Tarlton's. Luca says excitedly "I went Kelly Tarlton's." Billie turns around and looks at me excitedly "Kelly Tarlton's!" Kylie then tells them they are eels. She tells them for the next one that Foo Foo [centre rabbit] likes to eat this plant and that it's called puha and gets them to copy that. Amelia asks "I like it?" Kylie "Yes you might like it." ... When Kylie turns the page to 11, Immy calls out "haka!" Kylie "Yes, it's what the All Blacks do, it's the haka. Let's count the men. ... At the end of the story, Immy stands and does haka movements, slapping her thighs and stamping one foot. (1K/226)

Evidence of children making connections between funds of knowledge-based interests and minitheories is evident in this interaction with connections made to previous understandings and experiences.

Moreover, as a bicultural curriculum document, *Te Whāriki* places a responsibility on teachers to incorporate te reo and tikanga Māori in authentic ways for children to understand their national language, culture and aspects of national identity (J. Ritchie, 2003; J. Ritchie & Rau, 2006). Kylie and Louise's actions went beyond those of teacher interest influencing curriculum. It is appropriate that teachers introduce experiences that children may not gain elsewhere that may stimulate interests and is consistent with Wells' (1999) suggestion that the role of education is to do so. In many settings, biculturalism may be one of these experiences. Children's interest in understanding their identity as a NZer is explained in chapter eight.

As further examples of teacher interests, Christine's interest in dance and Louise's in health, fitness and cooking were noted when introducing them. These contributed to the curriculum in a long-term way. Christine led dancing practices and preparations for an annual winter disco for the children and their families; Louise cooked with the children every Friday and encouraged children to develop early conceptual understandings about nutrition, exercise and health. Barbara's interest in biology has featured in chapter six. Recognising that teachers can legitimately stimulate children's interests, and that these then carry over into projects or activities that children choose to engage in, was a major outcome, particularly for the TK teachers who developed a display about these. Teachers' interests create ways children can be exposed to further funds of knowledge, including those valued by a community and culture, and therefore are appropriate to include in a sociocultural curriculum.

Teachers' interests are an acceptable way to expose children to more experiences and funds of knowledge; perhaps different to those participated in with their families and communities. Yet, teachers did not initially recognise or acknowledge the impact of their own interests. One possible reason was that *Te Whāriki* identifies children's interests as a source of curriculum, without acknowledging that children's experiences and funds of knowledge (including exposure to teachers' interests) stimulate and inform these interests. The lack of overt recognition was also likely to be because highlighting their own interests was in apparent tension with their espoused child-initiated philosophies expressed in the individual and teaching team interviews. Further, teachers' interpretations of children's needs as another source of curriculum appeared to relate to developmental progress, rather than consideration of social and cultural aspects of human life and identity that could also be legitimately introduced.

Raising teacher consciousness about these matters in collaborative inquiry enabled more authentic group documentation to be recorded. That is, rather than group documentation focused on individual children's experiences of the same event (that did however often include teacher-child dialogue), shared learning and dialogue that occurred between teachers and children, and between child peers, was documented more often. In other words, in relation to the spiral of knowing, the data acted as information that teachers discussed in relation to their experience, culminating in new understandings and action on curricular and pedagogical documentation. Further, consideration of group documentation is in keeping with sociocultural theory, moving teachers from an individual developmental focus to the shared nature of co-constructed learning and knowledge building.

In addition, TK's participation in another project as well as mine in 2005, alongside some readings I had provided them with, had increased their understanding of the research process and the validity of findings linked to different methodologies.

While we are talking and looking at the programme for the early childhood research symposium that Christine is going to next Monday, Christine comments that she now reads research differently. She looks much more carefully at the methodology used in order to justify the judgements made. She has become aware of different research designs and how in-depth or otherwise the observations of teaching and learning practice might be that lead to the 'academic literature'. (TK/171)

Collaboration may empower teachers "at a second and deeper level to see that they are capable of constructing and using their own knowledge" (Reason & Bradbury, 2001, p. 10). Enthusiasm for undertaking research themselves occurred and TK applied to become a Centre of Innovation for the 2007-2009 period, using the children's challenges as their innovation, eager to research their value with diverse children. Although short-listed, the application was ultimately unsuccessful.

Provision of data for teacher reflection

Providing the fieldnotes in small weekly chunks enabled teachers to use them as a tool to reflect on how much occurs during a period of time. Teachers were surprised at how much one person focused on capturing a morning's events could write.

Christine - ... When first we were approached to take part in this project, it was very exciting, we talked to each other and said yes that would be very positive and we'll learn a lot, we'll reflect on our own practice and we did all that and within the first few sessions we thought oh my gosh, Helen remembers everything. And now that's not a bad thing but we were quite amazed at what happened in a day and in a session that we weren't aware of then we went into the next phase. The second part of not being too daunted by that, but then starting to use the documents [fieldnotes] that you sent through as ... useful to query our practice It's created great discussions within our team. The [field]notes have become a really positive reflective tool. (COI/15-16).

Angela - And I think it's a lot to do with reflecting on your own practices ... I just read back over. ... what has everybody been doing? And then you can see there everybody's different interests because we've all done so many different things throughout that morning, it's quite amazing to look and think well she was off doing this and he was off doing that. (COI/13-14)

I was in keeping with Costa and Kallick's (1993) definition of a critical friend supporting teachers, as they also began to see us as a collaborative team with contributions to make to each other's documentation that had positive outcomes for children's learning.

Angela - ... I'd tell you about what Aidan would be doing that week and then you'd be able to see that, and I'd read your notes, and ... you had picked up on things that I picked up on and that was good ... having that time to go over things that we both noticed together was reassuring me [about] things that they're interested in (COI/13)

Theresia - ... what happens over time is we build this relationship with Helen and with the children and you [Helen] just end up becoming part of the place now so all that initial fear [of the research process] falls by the wayside but I think too it's lovely that we had similar things that you pick up You perhaps follow some of that in a lot more depth than we can, so you helped to build a picture that we have of the children and the families and that gives us more information and builds our relationships with the children better. (COI/15)

Teacher reflection moved to a deeper level as teachers began to consider their practices without feeling threatened by my presence or the data.

While Ruth and I are chatting she mentions two things I want to note here. One was that reading the fieldnotes she was struck by how often children were interrupted in their play by a call to mat time or a meal and how often little ones were watching, sometimes excluded by the older children, then got their opportunity just before the call to tidy up. (1K/145/analytic note)

Theresia - ... I still have an awareness that what we capture [in learning stories] is like the end result. There's so much else that goes on and it is only just these small snippet snapshots that we get of what really happens for a child (COI/49)

The teachers, therefore, also became aware that there may be a serendipitous nature to whose and which interests were noticed, and that none of us were able to notice, recognise, record and respond to all the noteworthy learning happening for the children. This kind of realisation is significant in understanding that a curriculum built on children's interests is inevitably quite individualised and open to chance, even when teachers (and a researcher) are alert and have flexibility in their systems to try to ensure children are noticed.

Acting on reflection about the fieldnotes meant that without direct intervention from me, teachers' consciousness was raised about matters for children that may otherwise have gone unnoticed, such as the peer exclusion that Ruth discussed with me.

Aspects of teaching practice were improved upon. As a specific example, late in the study, teachers' access to the fieldnotes helped them to recognise popular culture as a strong interest of children's that they were not appreciating or acting on, more often

querying or redirecting instead. Thus, they began to change their thinking and responses towards the conclusion of the data generation period.

Christine - ... I have become very aware of how important that pop culture is and it came through the discussion I had about the castle and then about the dragon, and as I listened to the children talking about how to kill a dragon I could relate it to all the movies I've seen on how to kill a dragon. So yes you have to go and see Madagascar, we need to, when I'm sick I try to watch the children's programmes so I can see what's coming through in their play because to understand their play one has to have knowledge of their play. (COI/126)

Data as evidence to inquire into and shift practices

The second way in which the data were used during the group discussions was to provoke inquiry. As teachers shared and debated some of the issues they experienced on the topic of discussion, or relevant ideas read in the pre-reading, I used the fieldnotes data to query, confront and encourage inquiry into practice. My aim was to shift their thinking to be more in keeping with applications of sociocultural theory to practice. In actively facilitating this, I was again mindful of Guskey's (2002) model of teacher change. The model suggested that external opinion is insufficient; that teachers need to see actual evidence of problems with, or the benefits of changes to, their practices through enhanced learning for children before making lasting change to them or the underlying beliefs that inform them. The process I followed was consistent with Timperley et al.'s (2007) three identifying mechanisms of cueing in prior knowledge, retrieving it and adapting it in iterative cycles (spirals of learning), and creating and resolving dissonance.

Unsurprisingly, the play-based learning environment was the topic chosen for the first shared inquiry session. At this point I did not challenge teachers' interpretation of children's interests, given how deep-seated and rooted in the history of early childhood developmental play-based philosophy they were. Mindful that this was the first inquiry session, the data were used in this session to ascertain areas privileged in terms of space, resources and teacher interaction, and to identify areas that highlighted children's funds of knowledge-based interests that they might want more of. In this way, prior knowledge was tapped into, dissonance created and knowledge adapted to resolve issues related to the environment.

Christine - When I started teaching you had the classic traditional areas of play, they called it curriculum ... which we still have today unless we make a huge big effort to change those areas of play. ... Sometimes we redirect them, we take away the ability to choose, sometimes it is space, sometimes it is weather, sometimes it's just not possible to go outside, so they have to choose something but then again I started to ponder on that, how the teacher actually constrains a child's ability to choose ... And also we want them to think things through. (COI/25-27)

At 1K the discussion led to teachers altering the environment and noting children's responses to the changes. For example:

When I arrive, the inside environment has been changed around. Barbara and Wendy did this last night and are interested to see what the children's reactions are. (See photos). A 'book nook' is by the couches, the family corner is where the blocks and books were and the blocks are where the family corner was. ... This arrangement has resulted from them thinking about ... what works for children's interests, balancing that with aesthetic considerations and the multiple uses of spaces. (1K/139)

Documentation was also used to create dissonance and confront practice. During the group inquiry session on relationships with children, teachers identified knowledge of children and families as the most important category of professional knowledge required to build curriculum on children's interests. 1K teachers began talking about Jack, as he was about to begin attending TK's afternoon sessions as well as continuing at 1K on Fridays. The teachers discussed him warmly and with clear prior knowledge of him and his family. However, having analysed 1K's documentation, I pointed out that he was a child whose portfolio did not capture the child we had all come to know (see appendix 15). The constraint of part-time attendance was the explanation given. In both centres, children's regular attendance was a key factor as to how well their portfolios reflected teachers' knowledge of children and how often their interests were utilised to build curriculum.

As an example of documentation, both centres used a form commonly referred to as a "Me sheet". This was a questionnaire given to parents to complete about their child firstly on arrival at the centre: at TK upon joining the morning session; and at 1K at irregular intervals. After my interviews in the family homes, I became acutely aware that these Me sheets were quite limited in capturing information about the people,

places and things important to children. This criticism is shared by Lawrence (2005), who queries if such forms really provide information about the relationships and connections teachers wish to create. Further, both centres had at the back of each child's portfolio a sheet titled "Parent Voice", with a number of small boxes for parents to write comments or provide information from home in. Both the placement and the size of the boxes seemed to contradict teachers' belief about the importance of relationships with parents/families.

Given that both centres took pride in knowing the children and families well, I wished to encourage them to improve these forms or find other ways to get to know the children and families. For some time, my criticisms were not well-received. Because of the relationship we had developed, we could continue to discuss and debate the issue; dissension and disagreement being a characteristic of a well-functioning community of inquiry (Wells, 1999). Repeated opportunities for teachers to confront, consider, understand and trial new theories and related practices in a spiral fashion are important in professional learning (Timperley et al., 2007). Over a two-month period, further reflection and inquiry took place before dissonance was resolved, teacher knowledge was adapted, and changes occurred.

Helen - ... one of the things that ... you've both got on at the moment is who are my friends ... in itself is too narrow for finding out who children spend time with. ... to have something like, 'special people I like to spend time with' because something that's not captured to me in any of the portfolios that I've seen is how much time children spend with grandparents. ... maybe this comes back to your idea Angela of trying to develop conversations in the portfolios that you could put, what particular thing did your family do in the last month that your child really enjoyed? (There are mmms of listening/agreement during this.) (COI/57)

Christine again justifies their current practice with the Me sheets and I reiterate that these don't capture the importance of grandparents. She says they are thinking of revision of them, so I'll be interested to see. I am still thinking of Guskey's model of teacher change too – the teachers don't have the evidence that I do perhaps? so don't see the need to change as their beliefs have not been challenged? (TK/130 analytic note)

By this time, I had introduced teachers to the concept of funds of knowledge and they had found it appealing. I therefore talked about the home visits methodology, particularly given that this was historically a practice for kindergartens and knowing that teachers from 1K occasionally babysat for families. I was surprised to learn that Christine had tested out the idea again for herself already, indicating that she had been thinking carefully about my critique and, as Guskey (2002) suggested was important, was gathering her own evidence in order to confront their practices.

Christine - Home visits take the relationship to a different level, they really do, because they shift the conversation. I was lucky to go to Trent's house yesterday. I had an IDP [Individual Development Programme] meeting across the road from him so I purposely went and knocked on his door. His face was remarkable, it was really surprised, absolute delight and he showed me round his new house. You see now I go back and I can talk about his bedroom and his bunk bed ... these take a huge amount of time, we have so much other work to do in the afternoons. (COI/64-65)

As noted in chapter two, visits to children's homes offer insight into children's family capital and funds of knowledge in their communities and cultures, may provide an opportunity for teachers to create meaningful curriculum, and have a positive impact on teacher appreciation of diverse families. These challenges about relationships with children led to other considerations in relation to teaching practice and documentation in further inquiry sessions.

Finally, as evidenced in the following, TK introduced "stories from home", a full page of narrative.

Christine - ... after that last session, the next day Louise picked up Parent Voices and she said 'oh look at the wording'. ... we got what we asked for, but it wasn't giving us what we wanted so we just changed everything So we altered the "Me" sheets, we altered the challenge sheets, we altered the "parent voices" [to "stories from home"], and the "stories from home" was wonderful because it gave them that opportunity and the next morning [a girl was busy at a puzzle], and she talked about how she had done an amazing puzzle with her Dad at home, a 500 piece puzzle, so I handed Mum ... a story from home and Mum went home and wrote ... and then [Name] and her Dad typed the story. (COI/103-104)

Here, evidence of changes that would support deeper, improved outcomes for children were beginning.

Trial of research-based practices

The fourth way in which I attempted to blur boundaries was through providing readings about research-based practices to trial. Both centres tried ideas enthusiastically; the differing results illustrating both the complexities of each context and teacher knowledge. Data, alongside readings that included information about research-based practices to trial, were used to provoke teachers' thinking about alternative practices and act on them, consistent with a spiral of knowing. At first I used the capacity of their interest in the learning environment again. I provided some resources to encourage thinking about a deeper interpretation of children's interests in relation to funds of knowledge. Evidence of some relevant changes is detailed in the following examples.

Ruth - ... Kylie and I read it [Curtis & Carter, 2003] and got some ideas we've decided we're going to get another table so we can do more project work, so it stays out the whole time in the art room.

I am able to take note of how the inside environment has changed today and Theresia talks me through some of the reasoning [in relation to it being more home-like]. There are two sign-in sheets now to reduce waiting time. On the other side of these, there is a "lounge". Christine wanted this as a place to read books and look at portfolios with children; the puzzles are also here. The family play area is in the middle of the room beyond the lounge. The furniture arrangement makes it quite self-contained. Later, Christine tells me that Harry, Gina and Caitlin helped unpack this area last week and were like little mothers checking that they had things like the blankets and bottles for the dolls. (TK/133)

As Jordan (2003) noted, evidence of teacher-child dialogue is a powerful motivator for encouraging changes in practice. The teachers in both centres had warm and positive interactions with children, using active listening well. Yet, the pressure and pace of a group situation meant that teachers perhaps influenced children's thinking and action in ways children may not have chosen for themselves. As evidence, and to further improve the relationships they had described as the single most important mechanism in recognising children's authentic interests, I pointed out some examples of interactions where teachers' pace had been too fast for children. I also commented on children's positioning during mat time, using the notion of a T-zone, an area J. Walsh and Sattes (2005) define as the action zone in which children sit that attracts

most teacher attention. Consequently, where other children sit, they often miss out on inclusion in interactions. Some children demonstrated intuitive awareness of this zone, and appeared to utilise it consciously to receive or avoid attention. The readings for that session also included a digest of material introducing the concept of wait time (J. Walsh & Sattes, 2005).

Helen - ... I noticed with the large group here [TK], that idea of the T zone, and what I noticed was a lot of the Asian children were sitting outside the T zone, very fidgety, couldn't, didn't have show of following what was going on and so there was that, but there was also just a fascinating incident [at 1K] ... it was a little reader about what have you got in your pocket So it goes what have you got in your pocket, and you took a couple of responses probably, from the older children, and then you started going on with the rest of the book. The two year olds, they were going 'pocket' 'oh yeah' and like Finn's trousers have got about a million pockets (Ruth – yes!) and so he's in his pockets, going right through his pockets and he tries to talk to you but you've moved on, and he's not in the T zone. Immy of course with her chair next to me, 'you got pockets, you got good pockets, you got a camera, I click it?' (laughter) So they really got into this pocket thing, but when they were ready to contribute it was like, (Ruth - you'd gone on to the next page!) yes, it had gone and it suddenly occurred to me that even for a capable, competent four year old to follow what's going on is difficult at times (COI/68-69)

Wait time had been trialled by the teachers prior to the group inquiry session and led to an increasing understanding of the term intersubjectivity as a sociocultural concept. Wait time was eagerly embraced by Louise, who requested more material about it and whose enthusiasm inspired others. The following extended extract explains its use, and various changes in teacher practice, to improve understandings and practices related to children's funds of knowledge.

Helen - Tell us about the wait time. ... It was something that resonated with you wasn't it?

Christine - It was. When you looked at it [fieldnotes] you thought oh heck we do talk too fast, we interrupt.

Louise - Ask questions that we know the answers to. ... And I thought oh my goodness because so often we're teaching children and we're asking these questions that we already have the answers in our head, we already know what we want them to say and we almost direct them and lead them into and make them say it because we'll add the extra bit on for the clue and it's just like, we do it all the time.

...

Louise - I did it [wait time] at mat time. I didn't tell the other two teachers that I was going to do it. I'd been up the night before reading the article and someone had news and they brought in a real saddle. I'm not a horse person, I don't know anything but I thought well she's got the knowledge, she can tell. So she stood up and was having her news and I was doing this wait time and I used my seconds, like one, two, and ... I kept waiting and she actually came out with the information about what she wanted to talk about her saddle, not what it is and what do you use it for which you often do. It was her news, she owned it, she wanted to tell me about it. And then Theresia at one stage said "now tell us" so she went up and answered the questions, I'm pleasing the teacher, ... she might not have wanted to have said that at all, and it wasn't till at the end when I said to Theresia I was using wait time (laughter masks next bit). I waited a bit more and then another child called out 'Louise, come on!' (laughter) But there was a child who had never spoken at mat time started offering his ideas because I gave him time to think and I think too often we're into all this questioning with these answers that we know and it's just too quick and they haven't even had time. We know it because we know the answers so we don't even need to probe but they're sitting on the mat trying to stack up all this information building and then it's over and they probably leave and think, I actually had something to offer but they just went too fast for me.

...

Helen - Well I think it's a point you've made too isn't it Louise, that actually it lets them go in the direction that they were thinking of in the first place....

...

Christine - Until we get the information that provides the layers for the further conversation, that's when you get to the intersubjectivity, that's the joy of it, the two marrying up together because otherwise we're just asking questions that we know all the answers to and that provokes a discussion but it's not necessarily around the child. (COI/67-70)

Louise - Yes, after reading a number of articles on trialling wait time and actually listening to the child, we all think we listen, how often do you ask a question and then know the answer in your mind. When you say "tell me about", you have to listen because you don't know what they're going to say. ... There was another article as well a teacher in dialogue with the child and role modelled, even just repeating what the child [said], rather than bombarding and asking more and more questions ... so I've been reflecting on that a lot, I've been really, really conscious of it thinking 'did I

know that answer?' It's more exciting as a teacher and more rewarding, you're actually going to discover more things. You're actually leading the learning by asking those questions. (COI/144)

Louise's excitement at acting on a new pedagogical technique that was consistent with *Te Whāriki's* philosophy of reciprocal and responsive relationships as a basis for pedagogy, and the theoretical underpinnings of the notion of intersubjectivity, was evident. Furthermore, her revelations and changed actions are in keeping with what Buzzelli (1996) would describe as the moral implications of teacher-child relationships and interactions. Buzzelli argued that the ways teachers structure and control learning dialogue influences children's engagement, the kinds of knowledge shared and created, and reflects teachers' views of themselves and children as learners. In turn, these experiences are fundamental in shaping what and how children learn and their identities as learners. Louise's changed approach to the children empowered them to pursue their own interests and learning positively.

1K also trialled wait time, with variable success, partly due to the capabilities, motivations and mixed ages of the children alongside the constraints of group times.

Wendy - Different children too, like I didn't do it with Isabel, which I was quite interested, she would just sit there and look at me and I carried on and [Name] answered for her and [Name] answered the next time for her, so she was still getting away with saying (nothing). (COI/69)

Claire accepts a book that Safiya has chosen, "I can draw" Again the children name the last word on each page from the picture clues - clouds, buildings, cars - Gianni "Barbara's car!" He has noticed a small yellow VW and truck in the accompanying picture – fences (Gianni is still talking about the truck), a page that says 'children' the group guess first as playground and slide, Claire "What else?" Kylie "Who's playing on the playground?" The children say "kids." At the end of the book, Claire goes back to the page with the car and truck on for Gianni to point out as he is still talking about the truck as being like one his dad had. (1K/199)

These examples demonstrate how a change in teachers' practice can be promoted by evidence-informed inquiry that results in improved teaching and learning practices, in this case pedagogical relationships that enable children to reveal their interests and

inquiries in genuine and authentic ways. Both children's and teachers' knowledge about many aspects of their lives and experiences could more meaningfully be shared through using wait time, leading to more authentic spirals of knowing and increasing intersubjectivity.

Provision of readings

A further way I acted as a critical friend was to support teacher knowledge of current research and theory. I provided readings from the early childhood literature that carefully integrated with centre philosophy and practice, accompanied by focus questions for discussion (see appendix 12). In particular, I tried to move teacher understanding of sociocultural theory to a more conscious level. Through ways that teachers described and acted on their relationship-focused interests-based pedagogical practices, they enacted aspects of sociocultural theory, but only Theresia had articulated this in the initial interviews (see p. 195).

I had received a challenge during the first inquiry group session to ensure that theory be relevant in what we addressed during our discussions. John and Prior (2003) categorised teachers involved in professional development as either research-oriented or practice-oriented, a point also made by Hammersley (2005) in identifying a contrast in orientation between researchers and teachers. Several teachers could perhaps be described as more practice-oriented in the present study and needed to be convinced of the relevance of research and theory. Timperley et al. (2007) also conclude teachers are not motivated to learn if they do not see the relevance to their practice. These authors comment that theory needs to be a resource used to inform practice. I first selected research and theoretical articles that would affirm the teachers' philosophy and practices, but also raise consciousness about building children's knowledge, as well as fostering dispositions, to broaden possibilities for assessment. I asked why knowledge of contemporary theory might be important as part of teacher knowledge, then related it again to the aspect they considered most important: their relationships with children. Later, readings that challenged philosophy and practices were supplied. Shifts in some understandings and practices occurred over the six month period as a result of the information supplied through the readings, the co-constructed inquiry and the collaborative knowledge building.

Several examples of these shifts follow, firstly in relation to G. Walsh and Gardner's (2005) research on learning and learning environments.

Ruth - ... We related to it, we thought it was quite good because it fitted in with our philosophy ... children working alongside each other and with adults and we've got that and we've got children alongside siblings and other children and adults. ... And also the big thing too at the end of the study they concluded that fostering positive dispositions towards learning was just as important as the acquisition of skills and knowledge and to me it is more important.

...

Christine - I felt quite confident that we were on the right track when I read this. ... And I really liked the idea that they were looking for higher order thinking, ... I think that's imperative in this day and age

...

Theresa - I think ... having that theoretical background somehow validates what we do or gives it more importance or gives us as a profession more [credibility] if you like in parents' eyes and the community's eyes out there being able to articulate and having it there to fall back on as the basis for your work is certainly very beneficial to educating a community. Also we like to do this, when you can say well research actually supports this.

Ruth - Well it's validating your own practice ... you've got the confidence to know that you know the theory behind why you're talking to them [children] in a certain way.

Theresa - And doesn't that make you seem a more professional person? (COI/42-45)

Here, Ruth and Theresa found research valuable for validating and articulating practice. Theresa realised that reading such literature provided teachers with the language and concepts they needed to articulate their knowledge to others in a bid to raise professional status. Helterbran and Fennimore (2004) note that it is important that teachers' attitudes do not carry "a hint of anti-intellectualism that works against the emergent strength of professionalism in early childhood education and belies the professional obligation to learn throughout one's career" (p. 269).

Much of the reading was designed to introduce or clarify concepts of sociocultural theory relevant to their curriculum implementation and their use of *Te Whāriki*. In the following example, scaffolding and co-construction as pedagogical techniques are highlighted in teacher thinking, improvement and inquiry.

Theresia - I like the power aspect between us which I hadn't thought a lot about, that made me really think about how scaffolding really places the power with the teacher teaching, whereas the co-constructiveness has more of that intersubjectivity

Christine - And that encourages the children to take that knowledge to others because they need to have that equal relationship as opposed to the hierarchical relationship.
(COI/70)

Once teachers were informed about sociocultural theory relevant to their practice, I began to challenge them again in subsequent sessions, this time about documenting learning in ways consistent with sociocultural theory. As noted earlier, group learning tended to be documented in relation to children's individual participation in shared activities such as painting or mosaic making, rather than at a different level of authenticity that foregrounded group dynamics, shared interactions and dialogue, and collaborative knowledge building. Both centres used a form of learning stories (M. Carr, 2001a), documenting children's interests in the context of their everyday experiences and interactions. Exemplars for individual children have been published (Ministry of Education, 2004). Recently, efforts to write group learning stories have also been realised (e.g., Te One, 2002). These reflect the collaborative approaches responsive to sociocultural theory being developed in Australia (Fleer & C. Richardson, 2004; Hatherly & C. Richardson, 2007) that foreground sociocultural context.

Theresia - You see differences in those kind of grouping situations in that, well the first one like Mrs Heihei's fence, it comes from the children and there can be equally valid learning going on in that kind of group situation as opposed to running with a group idea, because in her article she comes more from talking about the perspective of the shared, the real sociocultural thing isn't it of the shared responsibility and the shared power (COI/86)

A particular example of teacher growth occurred with understanding of dispositions.

Christine - ... A word that we think we understand but the concept in relation to education is something that we can't seem to get across (COI/79)

Dispositions have received much attention in research and professional development. Yet, as Guskey (2000) describes, it is common that "educators end up trying to implement innovations that they do not fully understand" (p. 149). The following example illustrates the difficulty teachers have in appropriating a new theoretical

discourse, when they have been embedded in another that mediates understanding of the new theory. Cullen's (1996) caution about layering new theories and practices over existing ones where surface understandings are present is also highlighted.

Although 1K teachers had participated in a year-long professional development programme on learning stories the previous year, a fundamental understanding of the term dispositions was lacking. This may not be uncommon, given that the exemplar material supporting the implementation of learning stories (Ministry of Education, 2004) echoes *Te Whāriki* in lack of underlying theoretical explanation, and is itself thin on the ground with explanation and specific examples of application of such a key term. Further, while references and suggested readings are included, teachers may not have access to these unless studying through an institution with a suitable library or having a critical friend based in a tertiary institution.

Kylie is also trying to do an exercise where learning areas are related to dispositions.

This seems a little odd as dispositions relate to people (and for our purposes, learning in particular) rather than areas. I tell her that I am planning to look at dispositions and have a good article for them for the third session. (1K/139)

Kylie was attempting to combine the developmental play approach of identifying what learning children can achieve in the various play areas in the environment with the notion of dispositions that comes from a sociocultural approach. This may be an example of what Claxton (1990) discusses as teachers' practical orientations dominating their thinking, that is, learning stories had been adopted as a form of practical knowledge in order to meet documentation requirements without a deeper understanding of the concept of dispositions that inform these narratives. Or it may be an example of what S. Edwards (2003) describes as teachers attempting to assimilate a sociocultural perspective into the dominant developmental discourse.

After reading the material:

Kylie realised from reading [M.] Carr (1997) for the next discussion group that their learning stories are not focused on children's dispositions. She has gotten out the ELP [Educational Leadership Project] template for learning stories that includes dispositions related to the strands of *Te Whāriki*. ... Kylie's idea is that they need to increase teacher understanding of dispositions and the things that children do to demonstrate these in order to improve the learning stories. (1K/165)

Here, the professional learning and inquiry part of the study's design helped Kylie to understand, appropriate and act on part of a sociocultural discourse, one in keeping with their relationship-focused philosophy and pedagogy.

Finding or constructing suitable interests-based planning or recording formats was elusive in both settings, given the propensity to balance teacher-initiated and child-initiated ideas alongside the spontaneous happenings of each day in planning. Further, while many teachers worked hard at assessment and planning documentation, both teams seemed to struggle with the concept of evaluation as part of the curricular process. Documentation on this aspect was light in both centres. To this end, I included Hatherly's (2004) article on assessment, planning and evaluation to stimulate possibilities. It was enthusiastically adapted for projects currently occurring in both contexts.

Kylie talks to me about this month's readings, noting that she has really enjoyed Ann Hatherly's article on planning. "I liked that one, that's me." She really likes the concept of ongoing evaluation and this has clearly created an a-ha! moment for her. She has already adapted the idea/diagram for her own purposes for planning.
(1K/201)

Christine - It's also a nice way to keep that documentation that you've been talking about.

Ruth - It just makes so much more sense to document and evaluate as you go.

...

Christine - But it's also a nice balance between child input and parent input and teacher's input back too. Planning has gone from totally teacher focused telling the children what to do; teachers have become invisible, like what do we have to do with anything, and then suddenly we're getting recognised again as having a particular role in what happens with the child (COI/122-123)

Christine's comment about the invisibility of teachers draws attention to Wells' (1999) concern that an emphasis on learning communities places too much emphasis on learning and not enough on teaching, already evident in that teachers had not acknowledged the importance of their own interests or societal values in the curriculum provided. Wells' concept of a community of inquiry stresses the role of teachers as both pedagogues and introducers of new experiences, in the context of

embedding learning in purposeful joint activities. In later work, Wells (2002) acknowledges the importance of pedagogical relationships in empowering curriculum experiences and children's learning to highlight the integral nature of learning-and-teaching, the hyphenated term he introduces. This term appears consistent with *Te Whāriki's* central metaphor of weaving learning and teaching experiences to form curriculum and that teachers are central to many of the learning story exemplars (Ministry of Education, 2004). Writing learning-and-teaching stories would also be consistent with the notion of distributed cognition raised earlier and "distributed assessment" (Cowie & M. Carr, 2004; Te One, 2002; see also Simmons et al., 2005 for an example). Christine's comment also aligns curriculum planning with the notion of funds of knowledge in honouring the contribution that parents may be able to make.

This section of the chapter has discussed five ways in which my role as a critical friend encouraged teachers to inquire into their practices, build knowledge collaboratively and improve aspects of teaching practice and documentation. In particular, it has highlighted ways in which my knowledge of their practices, gleaned during phase one, was valuable as evidence to constructively challenge practice, support articulation of contemporary sociocultural theory that underpinned existing interests-based curriculum and pedagogy, and move these practices forward further during phase two of the study.

Teachers' working theories and spirals of knowing

Ways in which some of the teachers' working theories and knowledge changed could be viewed through the metaphor and mechanism of a spiral of knowing. Further information and experience was added to community funds of knowledge and acted on to improve teaching practice and documentation. A summary of teachers' funds of knowledge-related working theories and spirals of knowing discussed in this chapter is provided in table 7.2.

Table 7.2 Teachers' working theories and spirals of knowing

<p>Working theories</p> <ul style="list-style-type: none"> • ... working theories contain a combination of knowledge about the world, know-how, strategies, attitudes, and expectations. (Ministry of Education, 1993, p. 38). 	<p>a) <i>theories about curriculum and pedagogy</i></p> <ul style="list-style-type: none"> • personal and professional qualities and dispositions formed influential, individual theories about recognising and responding to children's interests (pp. 185-186) • accessing knowledge of own parents enhances practice (p. 187) • using interests to plug experiential gaps in an integrated curriculum (p. 191) • biculturalism has a special place in curriculum, even if not initiated by children (pp. 204-205) <p>b) <i>theories about teacher knowledge</i></p> <ul style="list-style-type: none"> • the primacy of literacy as a culturally-valued fund of knowledge (pp. 191-192) • developmental theory and play as dominant theoretical underpinnings of interests-based curriculum and pedagogy (p. 194) • using general knowledge to engage with children's interests, especially where they coincide with teachers' interests (p. 198) • research literature is only useful to practice if it is accessible and connects to teachers' prior knowledge and experience (p. 200) <p>c) <i>theories about teaching practice</i></p> <ul style="list-style-type: none"> • experiences of being a parent influence being a teacher (pp. 187-188) • experiences with a range of children influence present and future action (pp. 188-190) • influences of authority figures created working theories about appropriate interactions with young children (p. 192) • creating a family/home-like atmosphere in educational setting to support home-centre connections (p. 199) <p>d) <i>theories about professional learning</i></p> <ul style="list-style-type: none"> • necessity to contextualise professional learning to make it relevant (pp. 196-197) • disposition for ongoing learning vital to change and improvement (p. 197) • networking enables practical ideas to be accessed to support children's learning (pp. 200-201)
<p>Spirals of knowing</p> <ul style="list-style-type: none"> • experience • information • understanding through a process of knowledge building • action 	<p>a) <i>curriculum and pedagogy</i></p> <ul style="list-style-type: none"> • the legitimate role of teachers' interests in a sociocultural curriculum (p. 206) • the potential of popular culture in building interests-based curriculum (pp. 209-210) • learning environment can be altered to reflect funds of knowledge-based interests (p. 211) <p>b) <i>teacher knowledge</i></p> <ul style="list-style-type: none"> • co-constructing knowledge with children to support interests-based learning (pp. 136, 189-190) • reading research-based literature provides teachers with the language and concepts they needed to articulate professional

	<p>knowledge to others (p. 219)</p> <ul style="list-style-type: none"> • academic and professional reading as sources of information to build on and change practice (e.g., understanding of dispositions) (pp. 200-202) <p>c) <i>teaching practice</i></p> <ul style="list-style-type: none"> • researcher challenges about Me sheets in portfolios (pp. 211-213) • researcher challenges about type and focus of documentation (p. 220) <p>d) <i>professional learning</i></p> <ul style="list-style-type: none"> • the potential of funds of knowledge as a conceptual framework for both relationships with children/families and interpreting children's interests (pp. 129-130) • reflection as a tool to improve understanding and practice (pp. 142, 208-210) • keeping up-to-date with changes in sector (including theory) (pp. 195, 225-226)
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Table 7.2 demonstrates that some blurring of boundaries between research, practice and professional learning had been successful, through the examples of spirals of knowing that involved collaboration and dialogue between the teachers and me. At the final group inquiry session, I asked teachers to consider what concepts were now conscious that had not been uppermost prior to the study. Each of those discussed related to sociocultural theory, indicating some success had occurred with teacher confidence and knowledge; and providing further evidence of merging dialogue between research and practice (A. Edwards, 2001).

Ruth - Sociocultural perspectives now. Learning from the child, using your knowledge of play and your background, how you interpret what they're doing.

...

Christine - Intersubjectivity. Meaning. That's the word that's been strong this year, it's probably the word that we'll press on a path now and although we knew about it before, we understand the concept behind it. I think [theory] probably underpins our practice because of what we do and how we talk Although we might not quote theory, I do feel now we've probably got a reasonable foundation and particularly based on the readings that we have had this year and probably it's given us a thirst to go and read more.

...

Ruth - [referring to phase two] It's just kind of got a momentum ... it's just been brilliant.

Helen - Why is that?

Ruth - Well because for me personally I've just learnt so much ... we said we were interest-based and child-initiated and all the rest of it ... I don't think we were, I felt like we were a few years back kind of thing. This is more current, more towards sociocultural aspects ... I've sort of known all about and thought [about it] but this kind of brought it more to life for me and just fits in with our practice. (COI/128-129)

Christine's and Ruth's feedback about the second phase of the project also points to further continuing their consciousness-raising and knowledge spirals in the future.

Outcomes for children

According to an evidence-based perspective, the next step for assessing the worth of teachers' learning and actions is whether or not this resulted in positive outcomes for children. As noted in chapter three, making connections between teacher learning and student learning outcomes is not uncomplicated due to the dynamic, diverse nature of teaching and learning. Further, in early childhood, some outcomes may be long-term and not observable in the limited time-frame of a research project. However, several writers indicate that there ought to be links established between teachers' professional learning and children's learning (see Timperley et al., 2007). The present study did not specifically research learning outcomes for children. However, the teachers initiated processes that were likely to effect improved outcomes in the following ways:

- children's ideas, inquiries, conversations and questions were increasingly responded to through attention to relationships, funds of knowledge, conceptual knowledge, popular culture and communicative strategies such as wait time;
- children's assessment became more focused and authentic through changes to portfolio documentation; and
- children's involvement in learning increased through an improved physical environment; as an open-plan space, for example, TK was rearranged to be more home-like and 1K created spaces for projects and spaces for privacy and time alone that increased concentration on book reading and singing to self for example.

Further outcomes from a funds of knowledge and inquiry perspective are suggested in the next chapter through an analysis of a significant piece of data.

Summary and conclusions

The first part of this chapter discussed findings in relation to teachers' professional knowledge. Highlighting the informal knowledge identified in seminal models of teachers' professional knowledge (W. Carr & Kemmis, 1986; Shulman, 1986; Wilson, Shulman & Richert, 1987), my interpretation extends the conceptual framework of funds of knowledge used recently by Andrews et al., (2005) and Gupta (2006). The range and complexity of evidence teachers draw upon, to inform their working theories of practice in the mix of planned and spontaneous interests-based interactions that occur in early childhood education, was usefully viewed through such a framework. Consistent with the emphasis on pedagogical relationships that underpins this study, these were categorised in three key areas: family-based funds of knowledge (personal and family experiences, and relationships with children); centre-based funds of knowledge (teacher beliefs and values, and influential role models); and community-based funds of knowledge (teacher education influences, professional learning opportunities, other study, research participation, professional and academic reading, and networking). Teachers' professional knowledge combined in complex ways to co-construct curriculum with children.

Neither professional knowledge nor funds of knowledge are static, and are responsive to ongoing learning in collaboration with others. The second part of the chapter has described ways, in my role as a critical friend, boundaries between research, practice and professional learning were blurred. Data about the children provoked the reflective dialogue and inquiry; hence all three parties co-constructed the community of inquiry. There were five ways boundaries were merged. Firstly, the research participation itself raised consciousness about curriculum built on children's interests so that, secondly, informal teacher reflection occurred through their reading of my fieldnotes. Thirdly, the data were used as evidence to shift understandings and practices related to children's interests in the areas of the learning environment, relationships with children (such as connections with home interests and significant people) and documenting learning. This was supported, fourthly, through the suggestion of particular research-based practices to trial and, fifthly, through provision of current literature and accompanying focus questions for group discussion. In particular, we worked collaboratively to build new understandings

grounded in sociocultural theory and act on these in teaching practice and documentation.

It is argued that such formal knowledge is filtered through funds of knowledge in teacher decision making. Therefore, examining the kinds of evidence teachers draw on, through the framework of funds of knowledge, has demonstrated the notions of evidence-informed practice and inquiry (Thomas, 2004). Teachers draw on much more than research-based understanding, the crux of the evidence-based practice argument, and can be supported by a critical friend to include evidence that comes from inquiring into practice. As a form of professional learning, this approach may shift teachers' practices consistent with the concept of a community of inquiry. Table 7.2 demonstrates that some blurring of boundaries between research, practice and professional learning had been successful, through the examples of spirals of knowing that involved collaboration and dialogue between the teachers and me. Demonstrating the power of distributed cognition and language as a cultural tool, dialogue was essential to collaborative knowledge building that drew on participants' knowledge to merge research and practice (A. Edwards, 2001). The goal of dialogue as a knowledge building tool is change and transformation (Wells, 1999), evident in teaching practices or curriculum documentation artefacts.

Chapter eight

CO-CONSTRUCTING COMMUNITIES OF INQUIRY IN EARLY CHILDHOOD EDUCATION

... [A]ll human experience was grist to their intellectual mill (Tizard & M. Hughes, 2002, p. 103).

Introduction

This chapter addresses co-constructing communities of inquiry in early childhood education. It does so, firstly, by discussing inquiry as human activity, reinforcing key notions of the present study. Secondly, an interpretation of children's interests, that sheds light on the nature of children's fundamental interests and inquiries, extends the continuum suggested in chapter two. Thirdly, a continuum related to teachers' inquiry, and fourthly, a model for an interests-based curriculum, that incorporate significant theoretical notions of this study, are suggested to support co-constructing authentic communities of inquiry. The continua and model advocate that teachers consider a more analytical perspective of children's interests. The model also justifies incorporation of teachers' funds of knowledge-based interests and inquiries, and socially-valued knowledge and experiences, within curriculum provision.

Co-constructing communities of inquiry

The overall research question guiding the present study was: *How might teachers, children and a researcher co-construct a community of inquiry in early childhood education?* Wells (2001a, 2001b, 2002) focuses the notion of participation specifically on inquiry as an approach to learning. In particular, Wells' (2001a) concept suggests teachers and learners explore together issues to which there are no predetermined answers or outcomes.

The present study drew on the participation and collaborative experiences of children, teachers, and me as a researcher, to investigate children's and teachers' inquiry in early childhood education. Data from both the teachers' documentation and my research provided evidence of children's interests and inquiries that, in turn, informed teacher and researcher inquiry. The choice of the term evidence-informed inquiry was used in the study to represent teacher knowledge as complex, and often informal and funds of

knowledge-based, rather than evidence-based in the narrow sense of application of formal bodies of knowledge alone to the practice of teaching.

Inquiry as human activity

Inquiry is part of what it is to be human (Lindfors, 1999); effective learning is a life-long process commonly involving intrinsic motivation, curiosity and engagement. Through an inquiry approach to teaching and learning, working theories are improved to build coherent knowledge that takes account of ongoing changes to experience and information, in order to act on this knowledge. As Claxton (1990) summarises it:

Learning at its most general is the business of improving our theories, elaborating and tuning them so that they keep track of the changes in the world and come to serve us ever more successfully (p. 23).

Claxton's (1990) philosophy and methods of education to move "towards the empowerment of young people to be enthusiastic and confident learners ..." (p. 4) are evident in *Te Whāriki*. Claxton's influence might be viewed in the document in the image of children, the overall goal for children espoused and the focus on learning processes such as dispositions and working theories. This thesis argues that in relation to teachers, Claxton's notion of mini theories, operationalised in the present study as working theories, is evidence of the complexity and contestability of curriculum construction that relies on teachers' professional knowledge that includes their funds of knowledge and ongoing evidence-informed inquiry.

Further, the thesis argues that the contributions of family and community capital to children's learning, in the form of family-based, centre-based and community-based funds of knowledge, enable them to construct knowledge and working theories drawn on in other contexts. The present study suggests children experience a variety of pedagogical relationships that provide access to funds of knowledge from which children's interests are stimulated. Further, the study suggests the same is true for teachers' funds of knowledge through the variety of pedagogical relationships that they experience in learning communities, such as their families, teaching team, teacher education programmes, and professional learning and inquiry opportunities that include participation in research. Such a finding is consistent with recent action research using a community of practice framework (Haworth et al., 2006; Jordan, 2003).

The vital link between inquiry and language as a powerful cultural tool is evident in the conversational dialogue that permeates early childhood settings. From a participatory perspective of learning, almost every social interaction can provide an intent learning opportunity for children and/or teachers if they are purposefully engaged and have adults and/or peers around them who encourage their efforts to inquire, learn, communicate and understand. For example, Imogen's working theories about babies having friends and the process of childbirth were revealed in conversation with peers on p. 164. Her inquiries reveal a "passage of intellectual search" (Tizard & M. Hughes, 1984, p. 91). Wells (1999) argues that an inquiry orientation emphasises:

... starting with 'real' questions that are generated by students' first-hand engagement with topics and problems that have become of genuine interest to them. For it is when learners have begun to formulate their own theories, to test them in various ways, and to submit them to critical evaluation by their peers, that they can most fully appreciate contributions to the problems with which they are engaged that have been made by more experienced workers in the field (p. 91).

As noted earlier, Claxton (1990) argued that minitheories (working theories) are a collection of ideas, rather than a coherent body of knowledge, and that as variations and challenges occur, theories become richer and more differentiated, later to be modified and linked together. Wells (1999) suggested that learners need to have a personal stake in the knowledge under construction. Lindfors (1999) noted that acts of inquiry occur within the ZPD as it is just what is beyond a child's current capabilities and understandings that has the potential for learning, not what is already known nor what is too sophisticated to make links to prior knowledge. While the experienced, albeit newly so, older sibling had not successfully challenged Imogen's working theory about friendship, she raised new information that was completely discordant with Imogen's understanding of pregnancy and birth alongside her current focused experiences with toilet training. Experiences in contexts where children are exposed to incongruous information make conceptual change more likely (Inagaki & Hatano, 2002). Imogen's working theories will be revisited in future as she revises her understandings, eventually integrating her everyday and conceptual knowledge.

Sociocultural activity is about mutual engagement in learning through sensitive, reciprocal and responsive relationships. From a transformation of participation perspective, current learning episodes build on and re-visit previous experiences, and are goal-directed, but not in a linear fashion (Rogoff, 1998). Working theories can, therefore, it is argued, be usefully viewed within Wells' (1999, 2001b, 2002) metaphor of a spiral of knowing. Rogoff's focus on changes of understanding (and subsequent action and artefacts) and involvement in dynamic learning experiences have much in common with Wells' metaphor. For children, learning is an ongoing incremental process of the four components of the spiral: experience, information, understanding and collaborative knowledge building. Where children are able to make connections with their previous learning, they refine their working theories about every aspect of their world in an effort to understand it and change their actions to reflect this new knowledge. Where children are unable to make connections, the inconsistent information is likely to remain as discrete knowledge to recall later when presented with similar information. Hence, gradually, more coherent conceptual knowledge is built. A spiral also implies there may also be backward steps in dealing with discrepant information and experience from time to time. Conceptual development therefore takes place through revision of theory-like knowledge systems under both cognitive and sociocultural constraints (Inagaki & Hatano, 2002).

The findings of this thesis suggest that children's funds of knowledge and working theories appear to move back and forth through these spirals of knowing as understandings are revisited, challenged and built on in collaboration with others. The action outcome of their learning can be viewed through their participation in learning. Examples include moving from simple stacking of blocks through to increasingly complex constructions that illustrate funds of knowledge-based experiences about mathematics and physics (see Tom's vehicle and Mobilo construction pp. 138 & 148); or repetition of songs, socio-dramatic play and book reading that add a little more each time to children's learning, resulting in their increasing understanding and participation (see Imogen and the lion hunt pp. 145-146). This metaphor, alongside a clearer understanding of the notion of working theories, may be a way for teachers to assess outcomes of children's learning in a progressive fashion consistent with sociocultural theory.

In this study, teachers' knowledge base was more complex than children's due to their age, experience and maturity and exhibited a mix of professional knowledge. However, teachers' ongoing inquiry in phase two of the study, reflected increasingly sophisticated working theories about aspects such as sociocultural perspectives on relationships with children and families, due to the processes of experience, information, understanding and collaborative knowledge building that occurred during the research. Action on these spirals of knowing resulted in changes to teaching practice, curricular and pedagogical documentation and understanding of sociocultural theory.

Children's interests and inquiries

The present study aimed, firstly, to shed light on the ways in which teachers recognise and engage with children's interests in relation to children's prior experiences and funds of knowledge. The previous two chapters have used the concept of funds of knowledge, particularly within pedagogical relationships, as a conceptual framework to describe categories of children's and teachers' knowledge, and ways in which children's interests are stimulated, generated and extended. Children's funds of knowledge-based interests were revealed in their play in early childhood settings, a site Vélez-Ibáñez and Greenberg (2005) describe as a domain of learning where children observe, participate, practise and build on their knowledge in reciprocal and responsive pedagogical relationships.

Given the paucity of research on the topic of children's interests and in order to answer the research questions, it was vital, alongside identifying teachers' engagement with children's interests and the professional knowledge used to do so, that the present study shed some light on what these interests might be. As chapter six has foregrounded, a deeper-level synthesis of the data revealed that children's interests and inquiries, from an adult interpretation, appear to be about making sense about what it is to be a human member of their family, community, culture and society. E. Wood (2004) claims that children's interests "are often driven by their fascination with the world of adults, and their motivation to act more knowledgeably and competently" (p. 30). Bereiter (2002) argues similarly that:

... the most profound of children's questions seldom relate to activities of the moment. They relate to the larger issues and forces that shape the world - birth, death, good, evil, power, danger, survival, generosity, adventure ... (p. 301).

Neither writer provided empirical support for their claims, but the evidence of children's interests in the present study certainly substantiates their views and supports the findings of Brennan (2005, 2007) who claims that, fundamentally, children want to be part of the adult world.

Children's curiosity and exploration demonstrate their eagerness to learn and can be utilised as motivation for knowledge construction (Chak, 2007). Lindfors (1999) claimed that inquiry is universal and part of what is to be human. Pollard (2005) argued that making sense of people's lives, including our own, is a fundamental aspect of human behaviours. The data of the present study support these views. This chapter now provides some interpretation of what these inquiry acts and interests might entail. Firstly, a continuum is suggested that draws on and extends Cullen's (2003) analysis of children's interests and inquiries. Secondly, a fundamental inquiry on this continuum that guides children's interests is suggested, along with evidence of what at least some of those inquiry-based interests might be in children aged birth-five years.

A continuum of children's interests

Children's funds of knowledge-based interests, as revealed in the early childhood centre setting, appear to form a continuum. This continuum begins with play-based interests, moves through to interests that continue over a period of time and continues through to fundamental inquiries, related to what it is to be a member of the society that they live in. This latter interpretation supports Wells' (1999) notion of the genuine inquiries that ought to be addressed in a curriculum. Figure 8.1 represents a continuum of children's interests.

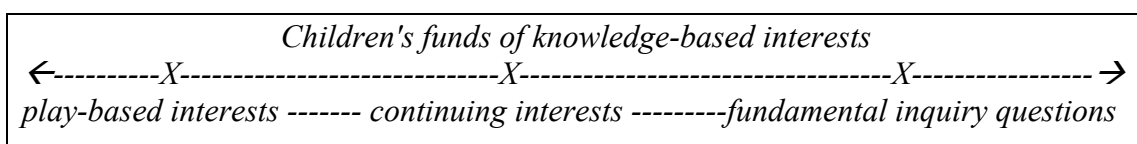


Figure 8.1. A continuum of children's interests and inquiries

Funds of knowledge feed forward and feed back into interests at each stage of the continuum, in a spiralling manner, as the key elements of a spiral of knowing take place and changed actions occur. Play remains a vital way in which children demonstrate, re-visit and extend interests, represented in all points of the continuum. However, the continuum offers a more analytical perspective of children's interests in a sociocultural curriculum.

Play-based interests

In relation to children's interests, both teachers and children first talked about favourite play areas in the learning environment. There is no doubt that unstructured learning materials provide much focus for children's interests. For example, in the present study, sand, water, blocks, Lego, playdough and art resources were used for both experimentation with the material itself and to represent children's everyday and conceptual understandings (see p. 135, Olivia's baking). Children also loved to stretch their bodies' capabilities on equipment that facilitated climbing and swinging (see pp. 168-169). New equipment and resources, coupled with new physical and cognitive capabilities, enabled children to progress with learning and development. Commonly, parents also mentioned these experiences as extending the resources they could provide for their children's play.

Yet, as Cullen (2003) pointed out, this, by itself, is a somewhat low-level interpretation of children's interests. Play-based interests appeared to be interpreted often as activity or skill-based, rather than as a combination of skills, knowledge and dispositions that represent interests and combine to form working theories. Further, as L. Wright (2004) claimed, resources are some of the tools of curriculum, not the curriculum itself. The findings of the present study support that teachers' interpretation at this level sometimes masked understanding or investigation of deeper interests and provided a narrow way in which to plan further curriculum experiences.

Continuing interests

At a point further on the continuum, there were interests revealed in the present study that continued over a period of time and often involved children in some conceptual learning. Examples of these included children's interests in the natural, physical and material worlds; in particular, children's interests in animals, insects and the physical

geography and unique culture of their country (for example, slugs and spiders, pp. 166-167). These interests were among those usefully supported by project work, the second type of interest supported by teachers, as noted by Cullen (2003). A notable example in both centres was children's involvement in the centre gardens (see p. 189), which continued throughout the year. Extending interactions with people, places and things encouraged children to continue exploration of interests and build everyday and conceptual knowledge.

This thesis exemplifies that as children grow and learn, some of these ongoing interests are likely to change, or to alter focus. For example, Jack's mother noted that boats, cars and trucks had been a major interest of his for some months, then, while the focus on boats continued, a focus on language and literacy through books and audio tools was prominent, followed, at the time of the home interview, by a focus on carpentry tools and activities (from which he later used the skills learned to build a small boat). Much of this was prompted by changes in the home, for example, a yacht restoration coincided with the interest in vehicles; later, a new baby brother's arrival meant that quieter, lounge-based, literacy activities were frequent for a while. When he began at TK, carpentry was available which supported his new interest in his own tool set and tool bench received for his third birthday. Each of these interests was intense for Jack and could have been developed by teachers as project work that combined and integrated these interests. (See also epilogue, p. 284 and appendix 15.)

Fundamental inquiry interests

A deeper-level analysis of the data ascertained a further point on a continuum: children's fundamental inquiries. The concept of a community of inquiry arose from researchers observing the importance of children's questions and ways these were responded to in creating meaningful learning.

Children were constantly engaged in inquiry and efforts to become "life-theorizers" (Inagaki & Hatano, 2002, p. 126). I argue that underpinning children's intent observation and participation in social and cultural activities, their focused pursuit of funds of knowledge, and early coherent conceptual knowledge building, is a fundamental inquiry about life as a human being. From an adult perspective (as the children did not conceptualise their interests in this way themselves), this might be

worded as: *How can I make sense of my world to lead an interesting, fulfilling and meaningful life as a participant in my family, community and culture?* This underlying inquiry was represented in children's interests through repeated dialogue and actions in many different ways in both centres, and the efforts to engage peers and adults in play and dialogue. This fundamental inquiry encompasses several "real questions" (Wells, 1999, p. 91), explicated below. Again, these are worded from an adult interpretation.

What will I do when I am bigger?

Children's interests in growing up and getting bigger, and the rites of passage of childhood, were evident throughout the study. These interests were part of a theme of "growing up and getting bigger". Children constructed working theories about these and tested them out in relation to their peers. In the present study, evidence reported in chapter six suggested that these include making friends, being born, progressing from a highchair to a table for meals, becoming toilet trained, not sleeping during the day and transitioning to school (see pp. 163-165).

What do intelligent, responsible, and caring adults do?

A second theme of children's fundamental inquiry appeared to involve finding out what it means to be part of a responsible family and community. Drawing on Berk (2001) I phrase this question as what do "intelligent, responsible, and caring" (p. 70) adult members of a culture do? There were many occasions where children were interested in family responsibilities. For example, in their self-chosen play, children were keenly focused on family responsibilities such as caring for babies, preparing meals, sewing, vehicle maintenance, and socialising together (e.g., pp. 134-138). On occasion, there were opportunities to enact these authentically, such as when Barbara let Imogen assist with morning tea for the infants (see p. 141).

In addition to this, children were interested in what other adults do apart from family responsibilities, and were most commonly exposed to this through family members such as parents, grandparents, aunts and uncles, parents' friends, plus teachers and other adults in the early childhood setting. At the centres, children demonstrated this inquiry in various ways and were supported by teachers and parents to increase their knowledge about different jobs, such as being a fire-fighter. Curriculum events such

as excursions commonly drew on parents' as well as teachers' and children's funds of knowledge (see appendix 14, p. 354, trip to fire station).

How can I make special connections with people I know?

The present study's focus on the social-constructivist branch of sociocultural theory emphasises pedagogical relationships. Children's interest in people seemed to be underpinned by a strong desire to be part of learning through social interactions. Being a member of a family, followed by having relationships with friends that extended into socialising and community activities, was an often all-consuming passion of children's that, in turn, determined which interests and inquiries would be followed in a self-initiated manner. The special case of siblings has been identified as one key pedagogical relationship that provides funds of knowledge, and was a likely source, for example, of the common interest in caring for babies (see pp. 140 & 162).

How can I make and communicate meaning?

In the present study, the ability to communicate verbally and non-verbally was a powerful stimulus to interests and inquiry. Moreover, for toddlers, expansion of verbal language facilitated adults' ability to respond meaningfully to their ongoing interests and inquiries indicated initially through their intent participation (see the example of Aidan, p. 251). Vygotsky (1978, 1986) highlighted language as the most important cultural tool children develop in their quest to make meaning, understand their world and participate in it.

With regard to written communication, toddlers' interest in symbols and mark making developed with young children into an interest in early reading and writing abilities. As noted earlier, both parents and teachers stimulated, encouraged and supported an emphasis on literacy as a cultural tool and fund of knowledge that enabled access to meaning making and knowledge building (see pp. 147-150). Children's interests and inquiries into literacy were represented in many play activities and was an area strongly promoted by teachers.

How can I understand the world I live in?

Exploration and understanding of the natural, physical and material worlds was a strong interest across the age groups. Biological phenomena that targeted children's

spontaneous attention and interest were human bodily processes, pets and other animals, likely mainly due to their life experiences thus far. It is likely that children expand their biological knowledge using personification while taking care of animals at home or in early childhood settings (Inagaki & Hatano, 2002). Children's inquiries seemed to pursue questions such as: How are these animals like me? How do humans, animals, plants and trees "get born" and die? How does this work? What are the features of the world I live in? These were most evident firstly in the domain of science, specifically naïve biology (Inagaki & Hatano, 2002), with an emphasis on small animals and insects such as snails, worms, cicadas, their own pets, butterflies, sea creatures, and everyday phenomena (see pp. 166-167). Secondly, these occurred in the domain of technology, or naïve physics (Wellman & Gelman, 1992, 1998), with interests such as cars, trucks, telephones, mobile phones, cameras and computers, cogs, and batteries.

How can I develop my physical and emotional well-being?

Children's focus on their well-being and increasing competence and control of their bodies was evident in the study. This was supported by teachers' efforts to provide a welcoming atmosphere, a physically challenging outdoor environment, an emphasis on positive social relationships and resolving difficulties amicably, and an emphasis on healthy food habits. All of these were in keeping with teachers' personal interests and current government programmes, linking interests to community and policy initiatives.

Children's questions here appeared to include: Am I safe in this setting? How can I enjoy and extend my body's capabilities? How can I be healthy and physically active? How can I ensure my physical and emotional well-being? The use of interests such as attachment objects that connect home and centre was discussed as an example of emotional well-being (p. 113). A further example was children negotiating, problem-solving and resolving conflict for themselves, in ways likely to be different to an adult's intervention (p. 161). In relation to physical well-being, most children enjoyed opportunities to climb, swing, hang, jump, run, kick balls, ride bikes and create structures that further developed these skills and abilities, such as Tom's rope climbing (pp. 168-169).

What is special about my identity in the place I live in?

Several interests and inquiries that spread over a period of time appeared fundamentally related to identity, specifically that of being a NZer. Some were child-initiated, such as Tom's interest in rugby and the All Blacks stimulated by his father (see pp. 143-144), also represented when Imogen made a connection between the rugby haka and a book Kylie was reading. Water-based, outdoor activities, such as going to the beach, boating, fishing and swimming, often viewed as typical leisure pursuits of New Zealanders, were also popular. Teachers such as Kylie and Louise took the opportunity to implement the bicultural imperative of *Te Whāriki* through their interest in te reo Māori (Māori language), songs and books (e.g., p. 206). All of these experiences served to create a sense of identity for the children as members of a wider community and culture.

How can I express my creativity?

Children's interest in developing and expressing creativity also seemed to be a shared, ongoing interest representing a range of inquiries in each centre. A possible gender bias was evident with more girls than boys interested in paint and collage-based creative activity (see pp. 151-152) and boys with Lego and blocks (see p. 138) to represent their lives and knowledge, but boys participated equally in making mosaic pavers for the garden at TK. Further, many children were interested in dance and drama, possibly linked to their common interest in being active and challenging their bodies' growing capacities. An opportunity for some creativity was evident in the cape project at TK (see pp. 152-153), although many were influenced by the designs of their friends, highlighting yet again the role of peers.

Exemplar: Imogen and the lion hunt

The example of Imogen's interest in repeatedly going on a lion hunt was noted earlier (pp. 145-146). This illustrated the complexity and confluence of all three aspects to children's interests represented in the continuum of figure 8.1; that is, children's use of the cultural tools of the play environment, repeated and ongoing interests, and fundamental questions and inquiries. The convergence of these aspects with funds of knowledge, dispositions and spirals of knowing was also evident. Imogen was adding to her experience, collaboratively participating with others and acting on this experience in increasingly competent ways. Her interests (and outcomes in the form

of spirals of knowing) were: taking calculated risks with support (perhaps knowing this is part of growing up); making and communicating meaning; learning something through repetition and memory; gaining competence in remembering words, actions, timing and rhythm; coping with fear, danger and excitement as part of her well-being; involving her friends in risk taking and creativity in something she enjoyed; and other literacy-related knowledge activities such as finding the CD cover and reading similar books. In addition, the dispositions of curiosity, involvement, collaboration, perseverance and leadership were evident.

Recognising and supporting children's inquiries and interests

Lindfors (1999) argued that:

From birth, virtually all children develop the ability to engage others in their attempts to make sense of the world, and that this process occurs naturally in children's daily interactions with others. This view sees the emergent inquirer as actively and continuously engaged in constructing her understanding of inquiry acts: purposes, expression, participants, contexts (p. 49).

The example of Imogen's focus on the lion hunt illustrates Lindfors' argument. Children's learning in the early years is dynamic, informal, situated in authentic contexts and somewhat individualised, but appears to have common threads. A close analysis of this learning suggests children's interests form a continuum from children's play-based interests, per se, through to interests that culminate in, investigate and express fundamental inquiry about what it means to be human.

In relation to the continuum suggested, the tension authors have noted between developmental and sociocultural theories and their application to early childhood education is acute in the concept of play and its interpretation in the term "children's interests" (e.g., Cullen, 1996, 2003; Hedges, 2003b). A developmental, play-based approach to early childhood education has focused teachers on equipping play areas, in order to observe children's perceived interests and plan from these. However, this risks teachers narrowly interpreting interests as related to the play equipment and areas as activities. From a sociocultural perspective, as Vygotsky (1986) noted, play acts as a zone of proximal development in which children explore their sense-making of the world. When children play at being sisters or parents in the family play area, or employees in the sandpit, or engage in creative expression of their homes and lives in

the collage and block areas, play is an active, conscious realisation of their current understandings and working theories about human life, as well as providing evidence of shared experiences and understandings between children.

Therefore, this thesis argues that it is vital teachers recognise play area interests as an early point on a continuum and not necessarily as representative of children's real underlying interests. "Adults, even the most 'child-centered,' tend to trivialize children's interests, making them out to be more mundane and egocentric than they really are" (Bereiter, 2002, p. 301). At a point further along the continuum, these aspects of the learning environment were also used as sites for socio-dramatic play that represented everyday understandings, funds of knowledge, early conceptual knowledge and continued inquiries in those areas. It is important that teachers recognise and respond to these.

Further, Bereiter (2002) suggests Dewey's (1938) assumption that direct experience is important, still held by many early childhood teachers and drawn on in Wells' inquiry approach, is invalid. "The first [assumption] was that children's knowledge and interests are confined to the concrete and familiar. To appropriate a current term, we may call this the 'hands-on' fallacy" (p. 301). As Bereiter noted and is evident in the present study, children are interested in topics in which they can have no direct experience such as dinosaurs, astronomy, superheroes and princesses. Further, when offered the opportunity, children also became interested in topics such as electricity and other cultures. As Bereiter claims, children are interested in exploring conceptual ideas as well as hands-on experiential learning, and such interests need to be recognised when they occur and incorporated in curriculum planning.

At a more complex point on a continuum, children's interests represent children's inquiry into what it means to be human and a capable, functioning member of a society. This fundamental inquiry has multiple threads emanating from it. Several of these threads have been identified in this chapter as an adult interpretation of Wells' (1999) concept of the "real questions", that is, as some of the underlying genuine issues of humanity that children explore and investigate during their play in early childhood centres.

Of further significance, developing working theories and funds of knowledge in key areas related to their interests and inquiries, leads children to the beginning development of formal and coherent bodies of conceptual knowledge that are also vital in the adult world, such as literacy and science, and connections with the multiple identities and roles they will enact as adults. As with adults, inquiry into these fundamental aspects of life is ongoing, and understandings change with new information and experience, reflected in their changing working theories and spirals of knowing.

In summary, this thesis argues that it is vital that teachers become more analytical about children's interests. Further, it suggests that children's interests and inquiries can be interpreted in three key ways from play-based interests to continuing interests, through to fundamental inquiry questions that involve making meaning about their world in order to lead an interesting, satisfying life. Given that play is such a powerful way in which children represent, test and extend their interests, funds of knowledge, working theories and early conceptual understandings, all three aspects of children's interests ought to be engaged with concurrently in a sociocultural curriculum. In particular, it is suggested that teachers might recognise and emphasise fundamental inquiry more in curriculum co-construction. Moreover, systems that teachers put in place to ensure all children are catered for need to be flexible, and occur frequently enough, to account for changes in children's interests. Further, the necessity for teachers to have accurate knowledge to support interests-based learning, and engage in their ongoing inquiry into the nature of children's interests, is an important aspect of professional knowledge.

Teachers' interests and inquiries

Similarly, where co-constructed inquiry is incorporated into teaching team practices, teachers' interests and inquiry can be categorised on a continuum. The present study argues that a continuum of teacher inquiry may increase the depth of reflection, and enable matters teachers would not inquire into by themselves to be raised. Again, each of these will feed forward and feed back into inquiry at each stage of the continuum in a spiralling manner. The range of sources of teacher knowledge have been categorised in the present study as funds of knowledge to acknowledge the variety of evidence that teachers called on in their curriculum decision-making and

teaching practices. This evidence included some formal theoretical and conceptual knowledge. However, this knowledge was only called on when consistent with informal knowledge. This finding is consistent with Thomas' (2004) notion of evidence-informed practice; a concept that allows for a range of evidence to be considered, including evidence that comes from inquiring into practice. The importance of teachers taking ownership of changing knowledge and practice (Guskey, 2002) is a strong impetus to accepting and valuing formal knowledge. Figure 8.2 represents the four stages of teacher inquiry.

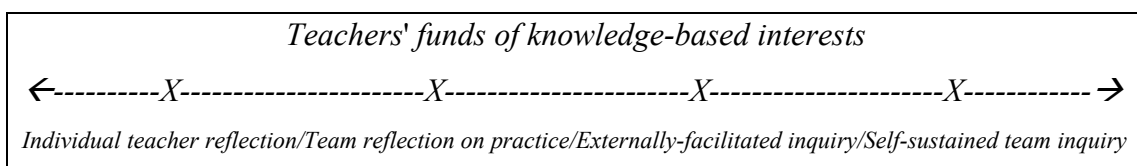


Figure 8.2. A continuum of teachers' interests and inquiries

The funds of knowledge for teaching methodology (González et al., 1993) saw teachers use data about children and their families as a source of reflective dialogue and inquiry. Data were used similarly in the present study to inquire into practice (see pp. 208-214). Groups of teachers meeting for co-constructed pedagogical dialogue about evidence of teaching practice can inquire into taken-for-granted practices with the aim of improving them for the benefit of children's learning. However, the present study argues this dialogue can be further supported by externally-facilitated provocation. An external facilitator, familiar with the context of teachers' practice and aware of their interests and funds of knowledge, can encourage and co-construct evidence-informed inquiry that teachers may not notice, recognise or choose to confront. Consistent with a spiral of knowing, when further information and experience (evidence) was offered through the research process in the present study, further self-motivated inquiry and improvement took place.

The problematic issue is how long such external facilitation from a critical friend is necessary before a group will become self-sustaining in their evidence-informed inquiry. Butler et al. (2004) found that one year of support in a two year process helped teacher inquiry communities to become less reliant on the facilitator for inquiry and support. Little evidence is available to guide researchers on this critical point, but if ongoing inquiry is a goal of the project, then teachers need to have

opportunities to learn the skills of inquiry themselves (Timperley et al., 2007). Support for self-inquiry with some external support and provocation from university-based research associates occurs in the Centres of Innovation in NZ over three years. However, the tentativeness of the teacher-researcher relationship, and the necessity to establish ways of working that empowered teachers without researchers leading these projects (see Haworth et al., 2006; Meade, 2006; J. Wright et al., 2006), might mean that some challenges remained unaddressed.

At a further point on a continuum, externally-facilitated inquiry by a critical friend that includes "data to be examined through another lens" (Costa & Kallick, 1993, p. 49) might become self-sustaining in the way that Cochran-Smith and Lytle (2001) describe in the concept of inquiry as stance. Groups of teachers willing to take a critical look at their own teaching, beyond the notion of reflection, are what MacNaughton (2005) describes as "critically knowing communities" (p. 188). MacNaughton notes that certain conditions need to accompany such an inquiry focus, including a reduction or restructuring of workload for teachers. In the present study, after six months TK was self-sustaining and keen to further their inquiry skills; 1K was unlikely to be for various reasons, partly because of the conditions MacNaughton discusses as limiting inquiry opportunities in full day settings.

The suggested four-stage inquiry continuum for teachers may, therefore, inform professional learning opportunities in a way that is authentic to teachers and is cognisant of Guskey's (2002) model of teacher development. Guskey is unequivocal that teachers require evidence of any necessity to change practices to improve outcomes for children; nor do they engage in change that includes adopting theoretical knowledge of their own accord or because a professional development facilitator advises them to. The findings of the present study support that, given teachers' propensity to call on a range of professional knowledge, teachers' practice might be considered evidence-informed, rather than evidence-based.

A co-constructed interests-based curriculum in a community of inquiry

The model proposed (fig. 8.3, p. 248) juxtaposes key theoretical notions of this study, using the metaphor of a learning journey on an interconnected path. Children's and teachers' funds of knowledge, interests and inquiries form the foundation for curriculum and pedagogy in a community of inquiry. Children's interests are broad and varied, and form a continuum reflecting their funds of knowledge, experiences of the world, age and maturity. Through the powerful cultural tool of play, they represent these interests in multiple and complex ways. Teachers' interests and inquiries have also been influenced by their funds of knowledge and life experiences and provide both extension opportunities for children and stimulate new interests in children. Teachers might also take into account, through their interests, community and societal expectations of children's learning. In the present study, examples of these included biculturalism, literacy and healthy eating and exercise.

The present study proposes that funds of knowledge (from the varying contexts of human lives: family, centre and other community settings), are central to interpretation of a meaningful sociocultural curriculum built on the notion of children's interests. Funds of knowledge, as a concept, encourages a deeper interpretation of the term "children's interests" and also justifies incorporation of teachers' and societal interests in curriculum. The findings of the present study suggest co-constructed interests-based curriculum is most meaningfully created when children's and teachers' funds of knowledge, interests and inquiries coincide, including when these have been stimulated by each others' interests and inquiries. This curriculum is represented in figure 8.3 by rainbows to recognise the diversity of children, families and teachers that make up each early childhood centre and determine the funds of knowledge, interests and inquiries that co-construct curriculum experiences in that context. These rainbows are linked by the integral nature of learning and teaching, represented by the Māori term *akō*, recognising learning and teaching as both a continuum and a concept that operationalises the knowledge and strengths of the teachers and learner. Therefore, this also grounds the proposed model in the context of Aotearoa/NZ.

Funds of knowledge can be utilised as a basis for co-constructed curriculum when supported by sociocultural theoretical concepts of learning. A spiral of knowing is a

useful metaphor for the ongoing, spiralling processes of knowledge construction. Coupled with sociocultural interpretations of dispositions and other sociocultural notions related to co-constructed learning-and-teaching (see pp. 126-127), everyday knowledge located in funds of knowledge is used to develop working theories. Collaborative knowledge building occurs in relationships with others (adults and peers). Dialogue in collaborative reciprocal and responsive pedagogical relationships assists participatory learning, particularly, for children, through intent participation. Gradually, working theories become more coherent and connected, and early conceptual knowledge is constructed. All of these elements are integrally interconnected, like interlocking bricks on a pathway (see fig. 8.3), and feed back and feed forward continuously during co-constructed learning experiences. The more of the stepping stones encountered on the learning journeys back and forth, the richer and more meaningful the learning and teaching. In this way, an interests-based curriculum and pedagogy might be enacted dynamically in communities of inquiry in early childhood education.

In the proposed model, early childhood curriculum remains viewed as complex, but has a framework in which to ground interests-based curriculum and pedagogy. In an inquiry curriculum, multiple perspectives, such as those of families, teachers and children, are valued, and inquiry both responds to and creates further explorations. Hence spirals of knowing also represent the ways in which children's and teachers' inquiry not only co-construct curriculum but impact on further funds of knowledge, interests and inquiries in compounding ways.

The interconnectedness of all concepts in some way is an aspect of complexity in a sociocultural approach to curriculum. As elements feed back and feed forward during learning, further knowledge building occurs among participants, often creatively (Paavola et al., 2004). This illustrates the dynamic relationship of learning-and-teaching, Wells' (2002) hyphenated term to describe learning-and-teaching as inseparable and as occurring through dialogic co-construction and participation in a community of inquiry. As noted earlier, this term also highlights parallels with the term *akō*. Wells' emphasis on authentic knowledge building is consistent with the view of learning as intent participation, involving inquiry-based interests, and using everyday learning as the basis for conceptual learning.



A co-constructed inquiry curriculum involves teachers recognising "magic moments" (Thomson, 1992, p. 239) in children's learning and responding dynamically, in an authentic manner, during interactions with children. This assumes teacher-child intersubjectivity and teachers having deep knowledge of diverse children's interests, abilities, needs and behaviours and, therefore, ways to engage with funds of knowledge-based interests. It also assumes extensive professional knowledge to draw on to interpret interactions, negotiate curriculum with children, and encourage, challenge and extend learning. As spirals of knowing and learning experiences increase knowledge and promote new working theories in new ideas and directions, curriculum is continually negotiated and co-constructed by teachers and children. Knowledge is revisited and new conceptual understandings added, with subsequent resultant changes to actions.

Moreover, curriculum is fluid and dynamic. Teachers act on both ongoing interests of children's and consider ways in which their own interests, funds of knowledge (including culturally-valued funds, e.g., biculturalism and literacy) and other professional knowledge (including formal knowledge) may be effected in the curriculum. While responding in-the-moment to spontaneous interests, specific experiences are also thought about in advance and set up for children to participate in, based on assessment of children's interests, abilities, needs and behaviours. Project work (Helm & Katz, 2001) might usefully incorporate children's real questions as part of the approach, including the fundamental inquiry questions identified in the present study. This notion of a co-constructed inquiry curriculum is in keeping with earlier claims in the literature that adults and children should co-create curriculum (E. Jones & Nimmo, 1994; Patterson & Fleet, 2003).

This thesis argues working theories, dispositions and other sociocultural aspects of learning, spirals of knowing, and funds of knowledge combine in a co-constructed curriculum to gradually build deeper understandings. Vygotsky (1986) described how children learn everyday concepts, then through play and language, and the mediation of teachers in children's ZPDs, recontextualise these into scientific concepts (see also Chaiklin, 2003; Kozulin, 2003). The notion of everyday concepts can be seen as having much in common with the concept of funds of knowledge gained through participatory learning in family, centre and community settings. It also has

commonalities with Hedegaard and Chaiklin's (2005) notion that personal knowledge as a basis for radical-local teaching and learning leads to an "explicit focus on the role of subject-matter teaching to support children's development in relation to the societal conditions within which they live" (p. 191).

These varying notions of everyday learning lay a foundation for later conceptual learning in more formal education settings, providing support for Vygotsky's (1986) views. This step to early conceptual knowledge is important in a sociocultural curriculum and pedagogy, and perhaps overlooked currently in early childhood assessment practices. Yet, it forms an additional potential outcome of participatory learning besides the learning processes that combine knowledge, skills and attitudes, such as dispositions and working theories. Further, the quality of the connections made between working theories, spirals of knowing, conceptual knowledge and funds of knowledge is dependent on the quality of the range of pedagogical relationships and dialogue children experience in supporting inquiry and knowledge construction.

Exemplar: "Why the tree cutting down?"

With a specific focus on funds of knowledge as sources of co-constructing inquiry, the following analysis of a curriculum event at 1K towards the end of the fieldwork demonstrates how children's and teachers' knowledge combine to co-construct spontaneous interests-based curriculum and pedagogy. Nine years previously, a magnolia tree had been planted at the centre as a memorial to a child. As well as the tree being culturally significant, one of the child's siblings was now attending the centre, so the relationship with the family had been enduring. During the year, the tree had become diseased and untreatable. It had the potential to become a danger in the outside area and a decision was made to remove it. The events of the tree's removal by two professionals stimulated inquiry in children as they eagerly and intently observed the actions surrounding its elimination. Children's inquiries, observed in their questions and intent observation, coupled with their working theories, spiral into new learning. Barbara and Wendy were the two teachers involved who sensitively mediate in children's inquiries to assist their conceptual understandings of the event. Key concepts of figure 8.3 are italicised in the interpretation column.

Table 8.1 "Why the tree cutting down?"

IK fieldnotes, pp. 230-234	Interpretation
<p>Two men have arrived to remove the dead tree in the playground. Some of the children have watched as the branches were cut off, Barbara and Angela collected some of the leaves, and the men have begun to think about how they will tackle the rest of the task... Aidan comes to find Barbara, saying what sounds like "tree crash, big crash." Barbara picks him up and walks outside with him, asking "Did they use a chainsaw?" Aidan "see saw." Barbara "No, chainsaw." She takes Aidan over to have a look at the tree during the break in activity. Immy and Billie have followed them and also look and watch what is happening. ... Immy to Billie "They's taking our tree eh?" ... Billie "Barbara where's our tree?" Barbara "The tree's been cut down by these men. Immy, our tree died. It didn't have any leaves to keep us shaded. ... But what we're going to do is plant a new tree with green leaves to keep us cool." ... Wendy arrives The children tell Wendy about the tree being removed and I comment that the men are up to the tree trunk and we wonder how they are going to get it out. Barbara goes over to the tree and pulls at it. Led by [Name], the children laugh and say she should push it. She does so and then suggests the children join in. She tells them to put more effort into it "Come on girls, stop being so weak." They all laugh and [Name] says they need more help "Get all the girls." Barbara says they need strong muscles "Let me feel your pipis" and she touches the girls' biceps. They laugh again. The action at the tree resumes as the men take the tyre from the base of the trunk. Immy "They pulling it up." Barbara "Are they strong? Are they using their muscles?" The men laugh and from this point, begin to join in a little with the children's interest in what they are doing. ... Billie climbs up on a sandpit storage area to watch the tree action for a while Barbara asks Billie "Can you see the roots of the tree?" ... Ruth comes down to see the progress. ... She is visibly upset and a child notices this and asks about it. Barbara explains to her that "It was a very special tree planted for a little girl that died and she's sad." Barbara tells her they will replace it.</p>	<p>A new cultural event in the environment, outside most children's experience, is in progress. Because of the symbolic nature of the tree, the teachers gather leaves to be used in later artwork. Aidan shows an interest in the event (<i>intent participation</i>) and uses newly-learned language to initiate <i>dialogue</i> with a teacher with whom he has a special (<i>reciprocal and responsive</i>) relationship. Barbara asks him about a tool being used (chainsaw), but it is outside his current experience, so instead he makes an <i>everyday</i> word connection with something he does understand (see saw). To extend his <i>conceptual understanding</i>, Barbara takes him to look at what is happening. Other children join in <i>intent participation</i> with them and engage in <i>inquiry dialogue</i> both with adults and between themselves as peers to make sense of this new experience. Barbara interprets Billie's question "where's our tree?" as being both literal and inquiring. She explains in <i>everyday concepts</i> why the tree is being cut down, that it will be replaced, and the rationale for this. Armed with new <i>funds of knowledge</i>, the children repeat this story to another teacher, Wendy, when she joins the group. ... I tell Wendy that one of their current questions (example of a "<i>real question</i>" for <i>inquiry</i>) is how the tree trunk will be removed. At this stage, the men are removing branches from the scene, so Barbara is able to engage children in <i>working theories</i>, theorising how the trunk will be removed. Here, they draw on their <i>funds of knowledge</i>. They suggest that strength and larger numbers of people are needed. (Barbara also uses Billie's special teddy to push the tree.) Barbara develops the idea of strength by mentioning muscles, also making a popular culturally-specific joke in NZ linked to two species of shellfish, one bigger than the other (mussels and pipis). When the tree removal men return, the children watch from a distance again and see that different actions and tools are used to remove the trunk. Barbara draws attention to the roots of the tree, something that children may not have seen before. In her responses so far, Barbara has been drawing on her <i>funds of knowledge, conceptual understandings</i> and</p>

The child suggests that they eat a bean and get the seed out and plant it. Barbara explains a little about the difference between a vegetable seed and a tree seed but tells her she had the right idea. She understands that trees grow for a long time and have branches but she asks "How do trees die?" Barbara "Sometimes they get sick and die, just like people. They get bugs and germs and just can't fight it off." By this time, Immy has come out of the art room and is standing under the pergola set up near the tree. She is becoming more courageous in approaching the action and calls out "Hello man." She then starts a chant with actions somewhat like a war dance and Billie and Amelia join in with her chorus "Hello man" repeatedly. ... The group is called inside for mat time. Immy stops and says "oh ah" disappointedly but goes inside. ... When the group is gathered, Wendy explains to them that the magnolia tree died and is being dug out. The children ask what is going to replace it. Wendy explains another tree and it maybe they can go to the shop with Ruth to buy one. ... Luca asks her "Why the tree cutting down?" [Name] "cause it's dying." Wendy repeats a little about what is happening and points out the skip [container] that the tree is being loaded into. Gianni repeats much of what is being said about the tree coming down and having no leaves. ... Gianni has been hovering on the edge of mat time and tells me quietly he wants to go and see the tree so I take him out briefly. It has just been pulled out of the ground and the men are now sweating and have stopped for a drink. One tells Gianni that PlayStation is more fun. ... [While washing their hands and eating morning tea] Gianni and Luca are still asking questions about the tree. ... [After morning tea] I suggest to Immy that we go and check on the tree as she has seen the loaded skip through the window. Immediately she heads off outside. She runs to join a group sitting on the side of the sandpit watching the action. ... Gianni asks Barbara where the blood is. She explains that trees don't have blood but have sap. ... The man chopping gives the axe to the other one. Billie "They taking turns." Immy "Yeah they take turns." Billie "That tree, not the mandarin tree." I point out to them that they are now lifting the trunk and comment on their strength. I ask Immy if she has muscles and she raises her

interest in biology (a favourite school subject and a focus of many of her own family experiences).

The arrival of the centre owner introduces a different dimension to the experience. Her understandably emotional reaction to the removal of this symbol is noticed by a child who asks Barbara about it. The child draws on her own current *funds of knowledge/everyday learning* about biology to theorise that in order to grow a new tree, they will need a seed and that these come from beans. Barbara acknowledges her idea and explains the difference, again drawing on her own *funds of knowledge* of biology. The child then asks another *important question* "How do trees die?" which Barbara uses *everyday understandings* to respond to, relating to the child's own experience of illness by talking about bugs and germs. Immy is a confident and gregarious child whose family engages in wide socializing. She uses her *funds of knowledge* to theorise how to attract the attention of people who have not yet been engaged in conversation to extend her learning. As there was initially no response, the chant "Hello man" became louder and more animated.

Wendy uses mat time to explain what is happening to all the children. Several have only recently arrived that morning, including Luca and Gianni. Although Wendy has already explained what is happening, *Luca asks about it again "Why the tree cutting down?" in order to review and understand the new information being given in a spiral fashion.* Gianni repeats much of what Wendy says to himself, as a form of self-talk, and means of absorbing, conceptualising and demonstrating understanding. Gianni has not yet had *first-hand intent observation or participation* in the experience and wants this to support his efforts at meaning making. I take him out to see for himself. One of the men notices his interest but suggests that this is hard work and that a popular game would be more enjoyable.

During a shared morning tea Immy notices the men carrying branches past the window outside which continues her interest. When she joins the group watching outside, more questions are being asked.

This time, Gianni draws on his *funds of knowledge* about human biology to ask where the tree's blood is (also an example of Inagaki

arms and grins. ... She spots another small wooden table closer to the action and calls out to me "Helen, I sit here. Come here." I go and sit next to her and she tells me "Look at that trolley, it so big." (That's called a wheelbarrow.) The children now watch and follow as the men take the barrow through the art room and out to the skip. Immy "Why they going that way?" (So they don't have to go up and down steps.) The group follows the men and Wendy explains the process of loading and unloading. The men return with the barrow full of ready lawn. They unload the rolls on the ground. Immy asks the man unloading it "Why doing that?" He replies "cause I've got to go back to the truck and pick some more up and make a pile." When he leaves with the wheelbarrow to get the second load, the children go to look more closely. A boy has just arrived and Immy and Danyela tell him what's going on. But they don't mention the ready lawn. (Immy, tell [boy] what that is.) "Piles." (Piles of what?) "Grass." Gianni "can I stand on it?" (We have to wait until it is laid on the dirt. It will need lots of watering, you like doing that.) ... Danyela returns to the men shovelling dirt into the hole and squats down, digging with a fork. Barbara recalls to me her childhood memories of digging in the garden, finding dirt and worms etc. We watch her squatting down, breaking up lumps of dirt with the small plastic yellow fork. I suggest that maybe with her interest in dinosaurs; she is practising being an archaeologist. Barbara approaches her and she looks up and says "chop." Barbara points out to her the difference between the dirt and the bark as she tries to break it up. ... Immy stops to watch the tree action. She then drops the doll and joins in Danyela's picking up of leaves, twigs and dirt and putting it in the wheelbarrow. (What are you doing?) Danyela "cleaning" Immy "helping." Immy asks one of the men "and this one?" He's still a bit unsure of the children but plays along and agrees it can go in. Other children are watching fascinated as the other man separates the rubber matting with a knife. Danyela is reminded that she is only picking up sticks and leaves and not putting dirt in the barrow. Barbara explains that the dirt is crumbly and they need it for the hole. [At this point, mat time and lunchtime occur.]

1K/229-234

& Hatano's concept of personification in naïve biology). This provides another opportunity to *extend conceptual understandings (spiral of knowing)* to differentiate human biology and plant biology. Further, the children check that it is just this tree that is being removed and not the mandarin tree, a popular place for climbing and playing, and a source of knowledge of fruit growth and maturation. Earlier in the year, the children had learned to wait until the fruit was ripe before picking and eating it. I revisit the notion that strength is required to remove something big and heavy. The children make a connection between their *everyday* experiences of small vehicles on wheels to learn a new word and *concept*: wheelbarrow. Again, they watch intently and query the rationale for actions occurring. The children are intrigued by the rolls of ready lawn, something clearly outside their experience that they did not have funds of knowledge to draw on to interpret what it was. Here their inquiry is not verbal initially; their efforts at sense making involve both intent observation and revisiting the experience with a child who has just arrived in order to try to make a connection (*making connections between working theories in a spiral of knowing*). I then question the children to check their understanding and attempt to continue the theme of *conceptual learning* of how vegetation grows and can be supported to do so.

Danyela has observed the men's actions closely and now feels sufficiently comfortable around them to imitate similar action. Again, Barbara draws on her *funds of knowledge* from her childhood memories, this time to understand Danyela's interest. We discuss our knowledge of Danyela's interest in dinosaurs to understand her actions. Immy joins her. In response to my question about what they are doing, here it seems they draw on their *funds of knowledge* about assisting their parents (or others) in gardening activity. The children appear to have an understanding that the use of a knife is an adult activity; one that their intent observation in this case prepares them for later in life, not to be enacted in the present.

In this extract of data, children have been exposed to a significant cultural event in the life of a centre. Curriculum has been co-constructed from children's spontaneous interest and inquiries into a cultural event, in the context of reciprocal and responsive pedagogical relationships. Children's understandings have changed through participation with people in cultural activity. The incident drew on children's current relevant funds of knowledge and extended some conceptual understandings, often through children asking the kind of real and serious questions of Wells' (2001a) community of inquiry. Through dialogue, they have demonstrated their funds of knowledge about plant and human biology, based on their observation and participation in experiences with their families, and their knowledge gained from Barbara and Wendy. Teachers drew on their own funds of knowledge and conceptual knowledge to respond to and interpret children's inquiries. The children's learning and inquiries have been grounded in authentic experiences they can make sense of. It was likely that planned curriculum would follow-up the experience, as the leaves saved from the tree were to be used in art work and the events and understandings revisited in the manner of a spiral of knowing.

Making connections: Funds of knowledge, spirals of knowing, working theories and conceptual knowledge

As noted earlier, the contested nature of knowledge has become a source of recent debate (Bereiter, 2002), including in relation to sociocultural early childhood curriculum and pedagogy (Anning, Cullen & Fler, 2004). The present study provides evidence to support that a sociocultural perspective of knowledge involves the kinds of knowledge valued by communities and cultures (Case, 1996).

Specifically, as one theoretical framework, the study draws on the notion of funds of knowledge (M. Carr, 2001a; González et al., 1993, 2005; Moll, 2000; Moll et al., 1992; Riojas-Cortez, 2001), arguing that this is a specific and important form of family and community capital.

The shifting nature of children's and teachers' funds of knowledge can be viewed through a central metaphor from the community of inquiry framework. Wells' (1999, 2001a, 2001b) metaphor of a spiral of knowing provides a basis for both a sociocultural curriculum and direction for inquiry and research-based discourse among teachers. Wells' notion of a spiral of knowing begins with experience and

adds information gained, which contributes to understanding through a process of knowledge building. As both children and teachers revisit and extend their interests and inquiries, experience and resolve dissonance, revise their working theories and add to their funds of knowledge, the metaphor of a spiral of knowing are enacted.

In essence, learning is about making connections between different forms of knowledge and experience (Claxton, 1990). Therefore, the notions of working theories and spirals of knowing have much relevance to the knowledge and actions of the participants in the present study. Yet, for children, making these connections may be difficult when conceptual understandings are being developed "and have not yet been confidently appropriated into identity and self-belief" (Pollard, 2005, p. 169). From this perspective, teachers can encourage children to think about and represent what they know, how this might be extended to take account of new experiences, where this knowledge fits in their lives, and how they might use such knowledge in the future.

Likewise, teachers can consider their own knowledge development. Teachers make connections between their individual experiences and knowledge and those of the team of teachers they work with. Growth in teacher understanding is most likely when conceptual understandings are shared or act as a shared basis for inquiry. A critical friend can further enhance inquiry and support knowledge development to be theoretically and research-informed in order to move towards stronger conceptualisations of key understandings such as the term children's interests, as in the present study. The notions of funds of knowledge, conceptual knowledge, working theories and spirals of knowing provide an appropriate interpretive framework for both children's and teachers' knowledge in an interests-based curriculum.

Conceptual change often takes the form of theory change, because concepts and conceptions are embedded in theories; changing one core concept in a theory generates changes in related concepts and eventually leads to a change in a whole set of concepts (Inagaki & Hatano, 2002, p. 152).

If a sociocultural perspective of knowledge highlights culturally-valued knowledge, then pedagogy based on culturally-valued knowledge co-constructs the knowledge,

theories, skills and dispositions children and teachers need to build their identities and understandings. Spirals of knowing that incorporate working theories, funds of knowledge, conceptual knowledge and the dispositions to investigate and explore knowledge, are key constituents of a sociocultural curriculum. It should be noted that there may be multiple spirals co-existing in a co-constructed inquiry curriculum, several of which connect with each other at some point. Hence the importance of establishing children's authentic interests and inquiries among the myriad of curriculum possibilities is highlighted. Focusing on children's learning from this perspective highlights both the learning processes, such as dispositions and working theories, and also emphasises conceptual knowledge outcomes, which may be further developed and improved through further spirals of knowing. Such an approach supports Bereiter's argument, cited earlier, that "both learning and knowledge building ought to be meaningful" (p. 255).

As an important rider, it should be noted that the degree of co-construction of inquiry will be different in each context. This will largely depend on the efforts teachers make to understand children's funds of knowledge-related interests, co-construct curriculum with children and access research-based knowledge to inform teaching practice. Another proviso is that curriculum and pedagogy are also impacted on by macro features such as policies. In the early childhood sector, these may be both positive and negative constraints to teachers' ability to enact interests-based pedagogy. Implications for policy to support a sociocultural curriculum are described in the next chapter.

Differing learning theories and models of knowledge and curriculum can be drawn on and co-exist in research and teaching practice, but require sophisticated understanding by teachers and researchers in order to do so. In this case, such theories and models might highlight the differing and changing roles, contributions and influences of individuals and groups in learning activity and knowledge construction. In this way, participatory learning is not inconsistent with a knowledge-creation model of learning (Paavola et al., 2004) discussed earlier (see p. 15) and promoting conceptual knowledge (Cullen, 2007b).

Some scholars argue that conceptual development takes place in domain-specific ways, through refinement of theory-like knowledge that concerns aspects of the world important to children. These knowledge systems are often called naïve theories, because, while similar to scientific theories, they do not involve any explanatory principles (Inagaki & Hatano, 2002; Wellman & Gelman, 1992, 1998). In particular, the present study provides further evidence for Inagaki and Hatano's idea that within "naïve biology", children reveal a personification-based understanding of the world; and try to understand something new by assuming it to be human-like. Links between naïve (or working) theories, spirals of knowing and Vygotsky's idea of the co-existence of everyday (i.e., experiential) and scientific (i.e., conceptual) concepts in children's learning can then be brought together. From this perspective, again, an emphasis on informal participatory learning can lead children to at least begin in their early years to build aspects of the coherent conceptual bodies of knowledge they will confront more formally in their later schooling and life experiences. As Sternberg (1994) suggested, adults who respond to children's inquiries and encourage exploration will foster conceptual understandings.

Participatory learning and interests-based pedagogy may also then be explained through Hedegaard and Chaiklin's (2005) notion of "radical-local" teaching and learning, where both general societal interests and individual personal development and learning contribute to the content of educational programmes. Through participation in the content of programmes, children have the opportunity to theorise "their own life conditions and future possibilities" (p. 9). This suggests that radical-local teaching and learning can be linked to children's funds of knowledge-based interests and inquiries and conceptual knowledge building, across a broad range of ideas about citizenship within cultures and societies. Yet, much of this may depend on teachers' ability to recognise these links and support knowledge building through their own professional knowledge or knowledge-seeking and inquiry skills.

Further, parallels can be drawn between the co-constructed knowledge that occurs in communities of inquiry and the common aspects of innovative knowledge communities that Paavola et al. (2004) highlight. These include "the pursuit of newness" (p. 562) through "cyclical and iterative processes" (p. 563) and mediating elements in the process of knowledge creation that include inquiry and dynamic

learning, to which I would add teachers as the key mediating link between children, families and early childhood curriculum, and language as a cultural tool. Viewing knowledge creation as a social process that reorganises community practices is a further aspect Paavola et al., emphasise, as is the use of the implicit theories and tacit knowledge of individuals as a starting point for community use (i.e., curriculum and pedagogy). In addition, going beyond propositional and conceptual knowledge to recognise the role of tacit knowledge is important, (in the case of the argument of this thesis, funds of knowledge are highlighted), alongside reconceptualising and making knowledge explicit through conceptual artefacts. Finally, collaboration is highlighted as a way to organise innovative knowledge building. Paavola et al. also note the importance of mutual trust and engagement between participants in learning that involves both shared understandings and the opportunity for critique and questioning; dissension and disagreement are features of a community of inquiry (Wells, 1999). The notion of dynamic, responsive, interactive teaching and the need for intersubjectivity should not be oversimplified as being part of the "warm fuzzy" nature of learning communities applied to early childhood education (see A. Edwards, 2005; Wisneski & Goldstein, 2004).

These curriculum possibilities occur within a pedagogy of reciprocal and responsive relationships, where funds of knowledge and conceptual learning are developed through intent participation in the everyday activities of learning communities such as families, early childhood centres and other cultural institutions. As noted in the previous chapter, Buzzelli (1996) suggested there are moral implications of teacher-child relationships and interactions. Buzzelli argued that the ways teachers structure and control learning dialogue influences both children's engagement and the kinds of knowledge shared and created.

Summary

Theories of human activity, including cognition, as mediated and distributed, generate fundamentally different ideas than cognitive-constructivist theories about thinking and action (Moll, 2001). The present study argues that a sociocultural perspective of knowledge calls attention to knowledge valued by communities and cultures; and that an inquiry orientation to learning in responsive pedagogical relationships assists children and teachers to collaboratively construct and create knowledge that can be

drawn on to develop working theories, and extend both everyday and conceptual knowledge. Teaching practice responsive to the notions of funds of knowledge and inquiry, and their potential for enacting a sociocultural curriculum and pedagogy with positive outcomes for children's learning, has been illustrated in the exemplar of a tree's removal. Children's interests represent culturally-valued knowledge and a more analytical interpretation of the notion of interests has been suggested through a continuum to recognise this.

Further, the importance of the early childhood setting as a place to represent authentic funds of knowledge-based interests and inquiries has been highlighted in the study. Vélez-Ibáñez & Greenberg's (2005) argument about the importance of the play-based early childhood setting as an opportunity to practise and consolidate learning is consistent with both Claxton's (1990) claim that learning by observation and participation is insufficient without opportunities to integrate the learning with one's own dispositions and approaches, and Wells' (1999) argument that what is currently known needs to be exposed to others who can extend and challenge the learning in a spiralling way. In this way, and with the mediating effects of relationships and funds of knowledge, each of the acquisition, participation and knowledge creation metaphors of learning (Paavola et al., 2004) can be recognised in children's thirst to make sense of their worlds.

In short, communities of inquiry may be co-constructed in early childhood education. Funds of knowledge experienced in pedagogical relationships, and the metaphor of a spiral of knowing, incorporating working theories, as a key aspect of children's and teachers' learning, have been shown to be relevant in the context of early childhood education. Continua to describe children's and teachers' funds of knowledge-based interests and inquiries, and a model for co-constructing interests-based curriculum, that encourage teachers' thinking about children's everyday *and* conceptual learning, are proposed. It is suggested these continua and model represent components of an early childhood curriculum and pedagogy responsive to a sociocultural perspective.

Chapter nine

CONCLUSIONS

Using 'inquiry and relationships' as the basis for rethinking curriculum causes the teacher to take a second (and third and fourth) look at the way he or she functions in the classroom. Building strong bonds as we question, wonder, and seek out the answers to our questions is a powerful way to teach and learn (Hill et al., 2005, p. xii).

Introduction

The central research inquiry investigated by the present study was:

How might teachers, children and a researcher co-construct a community of inquiry in early childhood education?

The study was guided by the following questions:

1. In what ways do teachers recognise and engage with children's interests in relation to children's experiences and funds of knowledge?
2. How do teachers choose whose and which interests will be engaged with in building a sociocultural curriculum during both planned and spontaneous teaching and learning interactions?
3. What professional knowledge do teachers use to assess and respond meaningfully to children's interests and inquiry and generate authentic teaching and learning programmes?
4. How might a researcher utilise research partnerships to blur the boundaries between research, practice and professional learning?

The lens used for this investigation was teachers' engagement in interests-based curriculum and pedagogy in early childhood education. This chapter highlights the key findings, arguments and contributions of the present study. It then discusses the implications of these findings for teaching practice, teachers' professional learning, policy and research. Towards the end of the chapter, the study's limitations are acknowledged and suggestions for future research offered.

Major findings

The major findings of the present study in relation to the first research question are that children's and teachers' interests and inquiries are stimulated by their funds of knowledge, constructed in pedagogical relationships during intent participation in

everyday life. The notion of funds of knowledge provides a credit-based and analytical way to assess children's interests and inquiry, respectful of their lives in their families, communities and cultures. Teachers' recognition and engagement with children's experiences and interests, including funds of knowledge-based interests, occurred in a piecemeal fashion.

In relation to question two, the findings suggest there is a somewhat serendipitous nature to the way teachers choose whose and which interests will be engaged with in building a sociocultural curriculum, during both planned and spontaneous teaching and learning interactions. Assertive, popular and verbal (often, but not always, older) children who attended regularly received most attention. The importance of formal and informal systems to address all children, within the constraints of group size and teachers' roles, needs future attention in teaching practice and research, if current policy aims of meeting educational outcomes for diverse learners are to be realised.

Regarding question three, teachers bring a range of professional knowledge to their curriculum decision-making. Significantly, the present study provides evidence that funds of knowledge act as a filter for formal knowledge. It also highlights the role of teacher interests and culturally-valued knowledge as contributors to an interests-based curriculum. The concept of funds of knowledge provides a more analytical way to examine aspects of teachers' knowledge as the types of evidence that teachers, individually and collectively, bring to their teaching practice.

Finally, in relation to question four, professional learning that results in shifting teachers' practices may be conceptualised as the co-construction of a community of inquiry between teachers and a critical friend with research knowledge, who spends sufficient time in a research setting so that ways of challenging practice are authentic and respectful of teachers. Effective practice reflects a culture of inquiry that involves a research-based discourse, in the case of the present study, reflecting contemporary sociocultural theory (see also Fler, Anning & Cullen, 2004).

The overall research question was: How might teachers, children and a researcher co-construct a community of inquiry in early childhood education? Wells (2001a, 2001b, 2002) focuses the notion of participatory learning specifically on inquiry.

Participation in the research study enabled participants to inquire into each others' learning and knowledge. The study's findings suggest that funds of knowledge, spirals of knowing, working theories, conceptual knowledge, participation, dispositions and reciprocal and responsive relationships are essential to an interests-based curriculum, and provide a way to theorise changing knowledge, inquiry and understanding for both children and teachers (and very likely a researcher) as co-constructed outcomes of participatory learning.

Key arguments of study

The key arguments that result from the findings of the present study are that ascertaining children's funds of knowledge-based interests and inquiries enables teachers to recognise and engage with children's interests analytically and authentically. This perspective also positions parents and families centrally in early childhood education, consistent with sociocultural theory and current philosophy and practice. A funds of knowledge perspective enables teachers to view children as competent and capable learners, who draw on a range of experiences in their lives to apply to new learning, and actively inquire into fundamental aspects of human life. This argument is consistent with sociocultural interpretations of *Te Whāriki* (Ministry of Education, 1996).

Similarly, the concept of funds of knowledge provides a way to view the complexities of teacher knowledge and the evidence brought to decision-making about curriculum and pedagogy. Empowering the contributions to, and participation of, children and their families and communities in early childhood education settings, has the capacity to enrich and strengthen teachers' and children's learning, and connections between people, places and things. Likewise, empowering teachers to articulate practice in ways consistent with current theoretical perspectives adds depth to their work as teachers and professionals.

Further, key notions of a community of inquiry such as dialogue, reciprocal and responsive relationships, and spirals of knowing (incorporating working theories) can underpin ways in which inquiry can be co-constructed across the various communities that are part of early childhood education. These notions support that the processes of learning highlighted in early childhood education, such as working theories and

dispositions in *Te Whāriki*, can be identified through theories of participatory learning (Rogoff et al., 2003; Wells, 2001a, 2001b, 2002) that also include attention to conceptual learning and knowledge outcomes (Paavola et al., 2004; Cullen, 2007b).

Contributions of study to the literature

This thesis makes a number of contributions to the literature on early childhood curriculum and pedagogy and teachers' professional learning. Firstly, the importance of teachers recognising and responding to children's funds of knowledge-based interests is offered as a deeper interpretation of the term children's interests, and extends that noted by Cullen (2003). A new perspective of children's interests has been proffered to recognise their fundamental inquiries and encourage a more analytical interpretation of the term "children's interests" in early childhood education.

Secondly, it provides illumination of the concept of working theories in children's learning, a learning outcome of *Te Whāriki* that has largely been unexplicated. It suggests that Claxton's (1990) notion of minitheories, and making connections between these, is relevant, and extends this interpretation further to view working theories within the metaphor of a spiral of knowing from a community of inquiry (Wells, 1999, 2001b).

Thirdly, consistent with sociocultural theory, the study adds to the literature through use of the conceptual frameworks of funds of knowledge (González, Moll & Amanti, 2005a; Moll et al. 1992) and a community of inquiry (Wells, 1999, 2001a, 2001b, 2002). These are juxtaposed to explain teachers' and children's individual and collaborative knowledge construction and justify teachers' interests and inquiries as contributions to interests-based curriculum. Further, co-constructing an inquiry curriculum involves a number of other key ideas consistent with sociocultural theory: dialogue, learning as intent participation, dispositions, conceptual knowledge and reciprocal and responsive pedagogical relationships.

Fourthly, in extending the notion of family capital (Donati & Prandini, 2007; Li, 2007; Marjoribanks, 2005) to include community capital, it challenges and extends current use of, and categories of, the framework of funds of knowledge (Moll et al. 1992; Riojas-Cortez, 2001) to incorporate a range of family, centre and community-

based experiences. The present study adds to existing literature categories beyond those related to parents; categories that recognise a range of pedagogical relationships and cultural affordances that stimulate, develop and extend funds of knowledge. Significantly, it adds weight to Vygotsky's (1986) perspective that everyday learning is a foundation for conceptual learning. While children will confront conceptual learning more formally later on, the study demonstrates that children are interested in conceptual knowledge building from a young age, and draw on their funds of knowledge to inform this conceptual knowledge building. Sensitive mediation from teachers with a range of professional knowledge assists this early knowledge creation.

Moreover, it extends the use of the notion of teachers' funds of knowledge (Andrews et al., 2005; Gupta, 2006) to viewing the types of evidence teachers bring to the curriculum decision-making as incorporating their funds of knowledge, and demonstrates ways they might access knowledge residing in the academic community. Teachers drew on a range of professional knowledge, including funds of knowledge, in their curriculum decision making. Hammersley (2005) claimed practice cannot be based directly on research because it needs to be filtered through teachers' experiences and understandings. Funds of knowledge appear to act as a significant filter, commonly complemented or reinforced by formal knowledge, rather than formal knowledge guiding teacher decision-making, per se. This extends earlier arguments in the literature that teachers' own beliefs and implicit (working) theories commonly determine how and when formal knowledge will be utilised in teacher practice (e.g., Claxton, 1990). Therefore, finally, the study provides support for the notion of evidence-informed, rather than evidence-based, practice (Hammersley, 2004; Thomas, 2004).

Bringing together these key arguments and contributions, the study proposes two continua that reflect an analytical perspective of children's and teachers' interests and inquiries, and how these might underpin a community of inquiry approach to curriculum. It also proposes a model for co-constructing interests-based early childhood curriculum and pedagogy consistent with sociocultural theory. This perspective may improve children's experiences in early childhood centres, and assess outcomes of their participatory learning beyond the current focus on dispositions to

include working theories, spirals of knowing and conceptual knowledge, all within a framework of engaging with children's funds of knowledge.

Methodological contributions

Increasing numbers of studies position children aged less than five years as active participants and informants about their own lives. The present study's focus on building relationships, using extensive participant observation, including children in interviews, and attention to ethical principles interpreted to be appropriate for children's participation, served to reveal a more analytical view of children's interests and inquiries. Moreover, some children developed an understanding of the processes and tools of research as a different dimension to documenting their learning and experiences, suggesting that children aged less than five years may be able to research their own experiences in some way, particularly if viewed within the conceptual framework of co-constructing a community of inquiry with other participants.

The literature noted that the role of the research and professional learning partner is rarely explicated in studies of teacher-researcher partnerships (Butler et al., 2004; Timperley et al., 2007). In the present study, the notion of a critical friend who takes sufficient time to understand the context of teachers' work (Costa & Kallick, 1993) before analysing data and introducing a professional learning dimension, and has research knowledge and skills (Goodfellow & Hedges, 2007) to assist teachers to integrate research, practice and professional learning, has been validated as a useful method in the present study. Again, a focus on relationship building was paramount to generating rich data, involving teachers in relevant and meaningful evidence-informed inquiry, and shifting practices to reflect a sociocultural discourse consistent with their philosophy and practice and current interpretations of *Te Whāriki*. Further, bringing together two groups of teachers from differing service types was valuable for both their networking and a researcher supporting, challenging and improving practice. This also illustrated that, through participation with children in different contexts, "we may come to see how the universal urge to understand the world with the help of others plays itself out in culturally and distinctive ways" (Lindfors, 1999, p. xii).

Implications of the present study

Transformation. That is the chief purpose of education – that all who are involved should transform their capacities to act, think, and feel in ways that contribute to the common good and enrich their own lives (Wells, 2001a, p. 1).

If teachers and children are to be active agents in transforming their learning, building their conceptual understandings and changing their worlds, interests-based pedagogy requires support from all those with a vested interest in early childhood education. Policymakers, researchers, parents and teachers "must make choices between many possibilities and take responsibility for those choices" (Moss, 2001, p. 80). According to Wells (2001a), the outcome of knowing is action. Therefore, researching children's inquiry from a funds of knowledge perspective has important implications for acting on understandings of children's fundamental inquiry-based interests. In turn, this has considerations for transforming early childhood learning environments, teaching practice, teachers' professional learning, policy and research.

Implications for teaching practice

A community of inquiry approach suggests interests-based learning is purposeful and focused on meaning-making. Dispositions such as curiosity and concentration are increased through the dynamics of relationships and spontaneous interactions between teachers and children, and are what brings a curriculum alive (Pollard, 2005). A focus on inquiry and funds of knowledge has implications for transforming approaches to current teaching practice. Unconstrained by external requirements in terms of specific knowledge outcomes, early childhood settings are in a good position to support and extend children in their areas of interest. A broader perspective of learning outcomes, consistent with participatory perspectives, that include for example, dispositions, working theories, funds of knowledge and conceptual knowledge outcomes, can then be related to these areas of interest as appropriate to each child.

Firstly, teachers' participation in sustained interactions with children will support inquiry. Within a pedagogy of reciprocal and responsive relationships, children's curiosity and exploration can be nurtured. A teacher's role becomes that of listening carefully to children, supporting, extending and challenging their ideas and thoughts. Teachers may need to look at ways to manage their roles and daily routines to enable such learning to occur. Spending prolonged time listening to children, particularly if

wait time is used as the participants in this study discovered, suggests that teachers ought to utilise uninterrupted time engaged in interactions with children. Yet, some studies suggest that teachers' roles, coupled with group sizes and teacher-child ratios preclude this from occurring frequently (e.g., Howes, 1997; McLeod, 2002; Nuttall, 2004). Jordan (2003) demonstrated that teachers' increased awareness of their interaction strategies will enrich the quality of interactions, no matter the length of them. Further, the potential of child peers as co-inquirers into their world and future roles they may undertake is strongly evident in the peer interactions in the present study. Teachers might consciously encourage and highlight peer tutoring in their pedagogical practices to usefully employ these relationships.

The present study defined children's interests as children's spontaneous, self-initiated play, discussion, inquiry and/or investigation that emanates from their social and cultural experiences. The continuum of children's interests proposed implies that teachers might carefully consider what children's play represents of their interests, rather than interpret the play activity as the interests itself. Teachers must think insightfully about the possibilities that the everyday play environment provides, and observe closely children's interests and experience with these to interpret them beyond the provision of well-resourced activities in traditional play areas.

Secondly, some interests and inquiry may be repeated and recurring in children's play and reveal deep and serious interests in topics or events over a long period of time, particularly if supported by interactions with people, places and things. These lend themselves to extended investigations and project-type work (Helm & Katz, 2001). Hedges (2002a) described one four-year-old child's extensive interest and knowledge in species of sharks and whales. To provide for this interest, teachers planned an excursion to an aquarium as a focus of several weeks' curriculum. The excursion itself, alongside the preparatory and follow-up experiences, led to increased conceptual learning about sea creatures by many children. Of further significance in relation to the present study, this child's interest stimulated interests and inquiry in several others. For instance, Hedges (2004b) reports another child who, prior to the excursion, appeared to have little or no knowledge of sea creatures, not only became interested in sharks, but inquired extensively into the technological (structural design and engineering) aspects of the aquarium itself. Through teachers' identification of

children's interests, and development into projects, other children also benefit from the planning and have interests stimulated.

Thirdly, in the present study, children's interests and inquiries revealed some fundamental questions about their humanity, culture and identity. This study provides empirical support for Brennan's (2005, 2007) findings and Bereiter's (2002) claim that children's inquiries are commonly about complex issues in their world. To identify these kinds of interests and inquiries, teacher knowledge of children's family, centre and community funds of knowledge is necessary. Therefore, a stronger interpretation of children's interests is that of meaning-seeking about deep and serious issues of citizenship, culture and identity. As children will find ways to represent these understandings in the educational context through play, teachers need the knowledge and skills to identify and support these deep-seated interests.

Moll et al. (1992) suggest that teacher-child relationships are lightweight if only built on knowledge of the child in the educational setting. Children's interests do not arise in a vacuum but are stimulated by their experiences and funds of knowledge in their families and communities. Offering a wide range of possible experiences in early childhood centres is, therefore, important. Recognition and acknowledgement of the role of teacher interests in legitimately stimulating children's interests within a sociocultural curriculum provides a further way teachers can become central to learning-and-teaching (Wells, 2002). It also enables teachers to incorporate culturally-valued knowledge in the curriculum, such as the bicultural imperative of *Te Whāriki*.

Partnership with families in children's learning is a strong driver in the philosophy and practice of early childhood education (Ministry of Education, 1996, 1998). However, a body of literature suggests implementing partnerships with parents can be problematic and requires maturity coupled with specialist skills and knowledge (see Hedges & Gibbs, 2005; Keyes, 2002). Complaints about parents' lack of participation are common (Gordon, 2002), yet, there are many reasons why parents may not participate in their children's education (Hoover-Dempsey, Walker, K. Jones & Reed, 2002). Keyes (2002) suggests that for effective partnerships there needs to be a

degree of match between the knowledge, cultures and values of teachers and parents. Yet, in an increasingly diverse society, it is less common to experience such a match.

Developing teachers' knowledge of all children's funds of knowledge-based interests in order to co-construct meaningful curriculum requires a coherent approach and multiple methods besides informal conversations and children presenting "news" to the group. A funds of knowledge approach moves teachers' thinking from having information about children to knowledge of children at a deeper level, one that the teachers in the present study clearly had in mind with regard to their relationships with children and families. Particularly when coupled with the notion of family capital, parents are recognised as authoritative sources of knowledge about their children, and as experts in life experiences and skills that could supplement curriculum. Making parents and wider family welcome in centres in various ways, is important. As one suggestion, mainstream services might learn from Māori perspectives of family involvement in children's early education about genuine hospitality for families in centres (J. Ritchie & Rau, 2006). Further, as Hensley (2005) noted, even by visiting one home, teaching practice may be transformed because of the experience in ways that benefit all children. Visits provide valuable insight into children's lives, experiences and family resources within their communities and cultures for teachers and researchers.

The potential of funds of knowledge methodologies applied to early childhood is immense. In acknowledging the cultural nature of funds of knowledge, a home visit approach provides a way to acknowledge diversity. In addition, the importance of parent-teacher "fit" (Keyes, 2002) no longer applies, as teachers become inquirers, changing their role from expert to learner, and show respect and humility towards the families of their students (González et al., 1993), acting with cultural efficacy (Gibbs, 2005). Moreover, it is essential that children are active agents in such partnerships in some way. Otherwise, as Maddock (2006) and Rich and Davis (2007) suggest, children may, intentionally or unintentionally, thwart teachers' attempts to develop effective partnerships.

In recent work in NZ, C. Jones (2006) highlights families and their funds of knowledge as crucial mediating influences in teacher knowledge and understanding of

children. C. Jones argues two ways in which teachers can access funds of knowledge are by careful and close listening to children's dialogue and following this up in informal conversations with parents, and through family contributions to children's assessment portfolios. Both these techniques are supported by the findings of the present study. However, in one of her chosen examples, C. Jones unintentionally illustrates that the funds of knowledge methodology employed by González et al. (2005a) has the greater potential for teachers to gain in-depth and meaningful understandings of children's family lives. An older sibling of the child C. Jones focuses on had attended the kindergarten; the teacher visited him at home when he had broken a leg. On that occasion, the teacher tapped into the artistic funds of knowledge of the family and later involved the mother in the kindergarten in ways that honoured her expertise. Yet, perhaps through oversight, C. Jones does not emphasise this as an authentic way to gain knowledge of children and families in the way that the present study argues.

As Feiler et al. (2006) point out, a funds of knowledge approach is not a panacea for the difficulties described in the literature about establishing and maintaining positive teacher-parent partnerships. Feiler et al. suggest that this difficult and complex relationship needs to be supported by using multiple strategies at different times and in various ways. The findings of the present study suggest that teachers be encouraged to develop other authentic ways to get to know children and families, alongside informal dialogue in the centre setting and portfolios as conduits between home and centre. Methods include home visits and evening events at the centre, such as TK's disco or 1K's Christmas party, which teachers use as an opportunity to focus on families. Further suggestions can be found in the "shoebox activity" (M. Hughes & Greenhough, 2006) or similar ideas or through children taking photographs of family and community events to bring to the centre (Feiler et. al., 2006). González et al (2005a) also suggest parent evenings and teachers visiting community events. However, I suggest these are likely to be less personal and successful than individual home visits, particularly given that some families may not ever choose to attend such events.

From the perspective of learning through intent participation, children in NZ may often not be part of adult settings such as workplaces, making it difficult for them to

understand aspects of these adult activities they are interested in. Limited opportunities to be part of the world of adults may restrict children's understandings of the mature roles of the community (Rogoff, 1990; Rogoff et al., 2003) and be contrary to *Te Whāriki's* overall aim for children. "Children's desire to be part of the adults' authentic, everyday lives ... calls into question the separate world we have created for children ... " (Brennan, 2005, p. 20).

In keeping with Brennan's argument that early childhood environments lack the authenticity and challenge of the adult world, the physical structure and activities of an early childhood centre could be reviewed to be less institutional and separate from the adult world. With a sociocultural focus on relationships and family and community funds of knowledge, the environment could be arranged to represent aspects of children's home lives, and more adults invited to offer expertise in learning experiences. Moreover, teachers could engage publicly in relevant work activities that children may be interested in. For example, in the present study, Theresia's presence at a sewing machine, coupled with the interest in making capes, skirts and bow ties, enabled this to become a long-term authentic project. 1K's small group trips to the supermarket, vet and garden centre also support children's funds of knowledge interests to develop further. Children may be interested in other teacher activities such as completing the roll, writing shopping lists and buying new equipment. These would provide additional development of funds of knowledge that could then be acted out in the play environment.

Curriculum documentation is in constant state of review and improvement as teachers engage with spirals of learning and knowledge building that involves a research-based discourse. In this case, more shared documentation and dialogue between teachers and parents is firstly recommended. TK's move to "stories from home" changed the contributions of parents in amount, content and depth from the small "parent voice" boxes located commonly at the back of portfolios where position added to the implicit message of the size of the box. Secondly, further moves to document group learning and display this as an example of a community of inquiry in action may be more authentic than individual portfolios in making the collaborative nature of learning visible, and reduce the burden placed on teachers to regularly update individual portfolios. Thirdly, documenting real experiences such as shared cooking and

creating and maintaining a garden authenticates such funds of knowledge-based experiences as valid learning opportunities. Fourthly, a sociocultural perspective of children's learning suggests that there may be a range of outcomes worth assessing in early childhood, beyond the current focus on dispositions, which includes early conceptual learning.

Implications for teachers' professional learning

In terms of teacher preparation, Korthagen, Loughran and Russell (2006) discuss a meta-analysis of teacher education programmes and their ability to meet the expectations and needs of student teachers. Applying a relationship approach to pedagogy and integrating theory and practice, they devise principles for teacher education that are consistent with the approaches suggested by the findings of the present study. They also note that as teacher education cannot fully prepare teachers for whole careers, the most important thing is to learn from experience how to build professional knowledge and construct theories of teaching and learning. Here parallels with funds of knowledge, co-constructed inquiry, working theories and spirals of knowing are evident and may also be fruitful to explore in the processes of teacher education.

Further, given that a relationship-based pedagogy appears to assist deeper recognition of children's authentic interests and inquiries, teacher education students might also be prepared to connect with the families and communities they will serve. Gordon (2002) argues that, as transformative pedagogy, home visits enabled student teachers to understand the contexts of children's lives, provided a method for authentic communication, and changed attitudes towards diverse families. Buck and Sylvester (2005) argue similarly that teacher education students need to learn to value the strengths and possibilities of communities' funds of knowledge in order to be responsive to students. Gordon encouraged student teachers to visit diverse families beyond their own family and cultural experiences in her teacher education curriculum. Her research found that most of the teacher education students arrived at a new appreciation for the complexities of the lives of students and families. Gordon noted that concerns about being made welcome were unfounded, and that such visits involved both pedagogical and personal transformation.

As noted, there is a focus on diversity in present educational policy derived from research evidence in NZ (e.g., Alton-Lee, 2003; S.-E. Farquhar, 2003; Mitchell & Cubey, 2003). Given the problems linking ability, achievement and culture raised in relation to this (Alton-Lee, 2006), Gordon's innovative approach ought to be considered. Given the complexities and problematic nature of parent-teacher partnerships in enhancing children's experiences, inclusion of such visits or other family-focused community experiences in teacher education curricula is recommended. In this way, students gain access to understanding the potential of family funds of knowledge, an appreciation of diverse families, learn respect for and humility in their dealings with parents and are better equipped professionally to engage with children's authentic interests and inquiries once they are confronted by the complexities of everyday teaching practice.

Similarly, teacher educators might find ways to get to know the funds of knowledge of the students they are preparing for careers in teaching. Completing a student self-portrait (Gordon, 2002) and/or writing narratives may enable teacher educators to understand their students' prior knowledge and experiences and draw on these in their own curriculum and pedagogy. In doing so, students also build on their own funds of knowledge alongside formal knowledge, and act with increasing competence and confidence in their role as teachers.

Further, as part of teacher educators' transformation, they also need to be current with theoretical knowledge in order for programmes to reflect contemporary understandings. Kane's (2005) review indicated that a reliance on developmental theory and play-based philosophies may still be prevalent, rather than this being one of many informants to curriculum. Bereiter (2002) notes that teacher educators need to prepare teachers to read current research and engage with its findings in an authentic way. Changes in theories and research have ongoing implications for the development of teachers' and teacher educators' knowledge and inquiry. Continued transformation through professional learning is vital. Upgrading qualifications through credentialing has been a hallmark of early childhood education over the past ten years, including for many in the teacher education community. Further study provides access to both current and diverse knowledge and is a way to motivate and stimulate thinking and changes to practice. It may be that a range of courses of study

would be attractive to teachers, and could incorporate facilitated inquiry as a method of improving outcomes for teachers and children. Graduate study is an important way that teachers can become part of a research culture and develop new understandings about theory and research, increasing the proportion of these as types of evidence teachers utilise.

Implications for policy

Firstly, given that professional learning appears to be considered by policymakers as the panacea by which teachers will become more current in their knowledge and practice, the findings of the study about the value of some professional learning raise some concerns. Both participating in and contextualising contemporary knowledge to their own settings appears to be most valuable to teachers. A shift in policy to long-term professional learning programmes that use the co-constructed and facilitated evidence-informed inquiry of this project may achieve better outcomes for teachers and children than multiple short-term courses.

Secondly, a different approach to professional learning that enables teachers to investigate practice alongside a research-based discourse, might involve collaborative studies or inquiry into practice facilitated by a researcher, but with less expense than the current funding provided for Centres of Innovation as there would not be a requirement for teachers to disseminate findings. The latter requirement is a problematic aspect of that research programme (Meade, 2006). Such an approach can be interpreted as exploring curriculum and pedagogy that is "contextually located and enacted by knowledgeable, thoughtful and sensitive professionals" (Goodfellow, 2001, p. 1), resulting in "satisfying ideas that might change how we - all of us - teach" (Nieto et al., 2002, p. 346), and be shared informally rather than formally. This approach would enable more teachers to be involved in evidence-informed inquiry. Moreover, such approaches would meet the characteristics of effective professional development cited earlier (Liebermann & Miller, 2001; Mitchell & Cubey, 2003).

In relation to teaching practice, a number of implications for policy become apparent. Firstly, a number of findings of the present study suggest that a minimum amount of non-contact time for teachers needs to be legislated if they are to enact and document a sociocultural curriculum and pedagogy and build evidence-informed practices

consistent with the philosophy of *Te Whāriki* and the regulations of early childhood education (Ministry of Education, 1996, 1998). Lack of non-contact time prevented 1K's teachers from documenting children's learning as fully as they would have liked. Insufficient time prioritised for teacher planning, discussion and professional learning has been noted in the literature (Bennett et al., 1997; McLeod, 2002; Nuttall, 2004). This discussion could usefully be informed by curriculum (and policy) documents that incorporate the theoretical underpinnings of the material. The second set of learning story exemplars that were due for release at the end of 2007 will contain theoretical endnotes to support teacher understanding and implementation (M. Carr, personal communication, May 30, 2007). This may act as a precedent for possible future revision of *Te Whāriki* as a curriculum document.

Moreover, when teachers in the present study had time to visit children in their homes, the potential of these visits for understanding children's interests was commented on. González et al. (2005) ask why teachers have to go above and beyond the call of duty in order to make deep and meaningful connections to students' lives. Further, where teachers in other sectors have been involved in NZ research studies, Alton-Lee (2006) notes that lack of time commonly prevents teachers from participating in cumulative knowledge building that could transform teaching. González et al. argue that a funds of knowledge methodology has transformative power for teachers as researchers, teachers and humans. But there are costs involved for teacher time that must be considered.

Secondly, the findings of the present study suggest group size and ratios certainly have implications for the capacity of teachers to enact an interests-based curriculum and support concern raised previously in the literature (Howes, 1997; Kontos & Wilcox-Herzog, 1997; McLeod, 2002; Nuttall, 2004; Tizard & M. Hughes, 1984, 2002). Even with specialised knowledge of pedagogical strategies, the amount of time a teacher has with children directly affects their knowledge of children, their relationships and their ability to teach effectively. While professional teachers have systems in place to ensure all children are catered for in the planned curriculum, it is inevitable in large groups that some children will dominate interactions and others will be overlooked in spontaneous and negotiated curriculum. The differences between the group sizes and ratios in the two settings in the present study highlight

this implication, with one group of teachers less able to co-construct spontaneous curriculum with the number of children they were responsible for.

Thirdly, as a caution for the case of early childhood education in NZ, while this study identifies professional knowledge teachers use to engage in an inquiry-based curriculum and pedagogy, including their own ongoing development, it is noted that other constraints also mediate teachers' ability to act on professional knowledge. These also require intervention and support from policymakers before children's circumstances can change. Constraints include teachers working with colleagues who are less qualified and/or less motivated (Jordan, 2003; Nuttall, 2004), the impact of routines on the curriculum (Nuttall, 2004) and the expectations of parents and educational authorities for achievement-based learning (Bennett et al., 1997; McLeod, 2002). Perhaps these were also constraints on the present study's ability to articulate a stronger framework for early childhood curriculum and pedagogy from a sociocultural perspective.

Fourthly, moves towards documenting more collaborative learning requires a change in emphasis from meeting individual children's educational outcomes to considering group outcomes. The current mandated requirements, the statement of desirable objectives and practices (Ministry of Education, 1998), emphasising outcomes for individual children, are in the process of being replaced by a new regulatory framework and gazetting the principles and strands of *Te Whāriki* (see Research New Zealand, 2007). This might support teachers to move in the direction of group assessment responsive to sociocultural theory (Fleer & C. Richardson, 2004) and also encourage a wider range of outcomes to be assessed concurrently.

A current focus in NZ policy is to provide syntheses of research evidence for consideration by teachers to promote learning for diverse children (e.g., S.-E. Farquhar, 2003). This synthesis (and later iterations) could usefully be the focus of funded professional learning programmes for teachers if policymakers genuinely want to promote evidence-informed practice. In acknowledging the cultural nature of funds of knowledge, such an approach also provides a way to acknowledge diversity. Gordon (2002) noted that value of "connecting teachers with the community in which

they teach and more specifically with the families of their students is often ignored in the literature on educational reform that stresses diversity (p. 72)".

Furthermore, rather than policy driving research, opportunities for collaborative partnerships that are mutually constitutive may have better outcomes for children. The example of the longitudinal study in England of Effective Pre-school and Primary Education (Sylva, Taggart, Melhuish, Sammons & Siraj-Blatchford, 2007) illustrates ways in which the agendas of both researchers and policymakers can be met, while retaining the integrity and independence of each partner. Such a model might be considered in NZ for further longitudinal studies building on the Competent Children study (Wylie et al., 2006), which considered the role of families in children's learning.

Implications for research

Research in itself does not transform practice (Hodkinson & Smith, 2004; McIntyre, 2005); therefore, the narrow notion of evidence-based practice is flawed. As A. Edwards (2004) argued, researchers need to plan for interactions between research and practice from the outset of a project in order to disseminate findings in useful ways to multiple audiences. Transformative activities in research include those that advocate for closer links between teaching practice and research through evidence-informed inquiry opportunities in professional learning and/or research (Anning & A. Edwards, 1999; Jordan, 2003; Meade, 2006; Timperley, 2004; Timperley et al., 2007). Collaboratively researching teachers' questions about teaching practice creates a shared community of inquiry with researchers. In addition, teachers engaging in research activity with a researcher's real questions, as in the present study, can also be illuminative of practice and foster change. In addition, the value of the research partner spending sufficient time in the research context has been validated. There may be implications from this for programmes such as the current Centres of Innovation: research associates could usefully spend significant time in the centre prior to supporting research, thereby provoking more authentic evidence-informed inquiry that challenges and extends teaching practices.

Teachers' ability to access academic literature, and its relevance to them, was discussed by the teachers in the present study. Teachers subscribed to local publications, in order to read local research and contextualise it to their own

situations. Further, unless they are studying, they cannot access a range of international literature without the mediation of a friend in the tertiary sector. The academic community has a responsibility to ensure teachers can access researchers' knowledge, as this will impact on theoretical understandings and the responsiveness of local curriculum processes to contemporary understandings. Otherwise, the risk remains that research may not be one of the forms of evidence that teachers use in decision-making.

In the present research funding climate, NZ researchers are compelled to prioritise publishing material in international academic venues. Yet, unless the academic community takes a role in dialogue about new theoretical perspectives, teachers may struggle to access these ideas to inform their practice. While most of the readings were well-received in the present study, teachers found one academic paper difficult because of its terminology and style. Academics have a responsibility as part of accessibility to remember that for many teachers, the discourse and jargon they use represent an "elaborate set of shared concepts and orientations ... [that are like a] foreign language ..." (Thomson, 1992, p. 247). In relation to a spiral of knowing, new information also needs to be able to be connected with earlier experience before it can be accessed for knowledge building, understanding and action. The teachers' comments provide food for thought for educational researchers wanting to make theory germane, about writing for various audiences, including journals aimed at teachers, in order to make a difference to teachers' practice.

Moreover, as Bereiter (2002) notes, many teacher educators have initially been part of the teaching craft culture, rather than the research culture, and have studied at graduate level after joining a university. Bereiter notes that it takes time to realise the connections that can be made between the craft culture and research culture through topics of shared interest. He notes that it is not just social interaction between the two cultures that is important, but engaging in conceptual change. However, I would argue that research practices, such as collaborative inquiry and a critical friend supporting evidence-informed inquiry, are steps to bridging the two cultures that also make research accessible to teachers. Nevertheless, the point remains that teacher educators, too, have transformations to make in order to facilitate research-based inquiry.

Limitations of study

Constraints related to the methodological approaches used in this study, and to children's participation, impacted on both the process of data generation and the interpretation of findings. These are described in the following section.

Methodological limitations

Case study

The present study took place in two specific contexts. In other settings, the teaching practices would reflect the goals and values of the relevant culture and community and may not correspond to those of the present study. This diversity is consistent with the accepted variety of early childhood services available and also with sociocultural theory and funds of knowledge methodology. Moreover, inquiry is a fundamental human activity (Lindfors, 1999) and a funds of knowledge approach used in explaining the findings is a credit-based model of viewing pedagogical relationships within families and communities that may be applied in any setting. Like Pollard (1996), I would argue that the matters revealed in this study are likely to resonate with the experiences of others, despite their cultural and temporal nature.

Theoretical lens employed

The theoretical lens employed by a researcher illuminates the research design, data generation and interpretive processes that culminate in the findings of the study. The present study has applied a social-constructivist lens, as one important domain of sociocultural theory (Rogoff, 1998); to shed light on what might constitute a sociocultural curriculum and pedagogy (González et al., 2005a; Wells, 1999, 2001a, 2001b, 2002) consistent with the early childhood curriculum document, *Te Whāriki* (Ministry of Education, 1996). A different theoretical lens would analyse data differently and expose different concepts and models. For example, to have utilised the other domain of sociocultural theory, labelled by Rogoff (1998) as sociocultural activity theory, would have placed much more emphasis on the cultural tools and activities of the curriculum. These may, in some way, provide access to funds of knowledge also, but were not emphasised by the theoretical lens chosen.

Furthermore, how children might express or demonstrate their interests in order to co-construct curriculum is, on the surface, an assessment issue for teachers. Underneath

this may be issues of power (Lindfors, 1999) about whose interests and inquiries determine the curriculum. Therefore, in relation to the present study, a post-structural lens (MacNaughton, 2004, 2005) might reveal some power differentials beyond whose and which interests were used to build and extend curriculum experiences, may highlight aspects such as popular culture more, and explore the gendered nature of children's interests in more detail. In addition, a post-structural lens might well reveal teacher identity as a vital element in what professional knowledge is learned, employed and valued in a sociocultural curriculum. Professional identity and agency in informed professional decision making are currently strong themes in the literature on professional learning (see, e.g., Burn & A. Edwards, 2007).

Further, the study might be appraised as adopting a sociocultural lens but still discussing children through the developmental lens of age. Such a criticism would be to deny that biological aspects of young children's development impact on their learning. Further, differences between sociocultural and developmental perspectives have often been overstated (Cole & Wertsch, 1996) and there is no reason both perspectives cannot co-exist among the range of theories that inform teacher practice.

Sample

In relation to the sample sizes, the number of teacher participants was restricted by number of teachers in each centre. All possible teacher participants were involved in the study. Of 71 possible child participants, 35 were involved: the number of children interviewed in family homes was negotiated with supervisors; 11 were interviewed.

The findings in relation to infants can only be regarded as tentative. There were only three infants attending 1K at the beginning of the fieldwork; initially two became part of the study, but one later withdrew, leaving only one infant participant. I decided not to approach his family for an interview, since one goal was to involve the children in the interviews. Given that he later became a very active toddler participant in the study, in hindsight I regret this decision, as the parent/s' perspective would have added insight and enabled analysis of children's interests and inquiry to occur more comprehensively across the one to five year age range. This points to the nature of inquiry in infants as being one fruitful avenue for future research.

Further, the once-weekly nature of the fieldwork appeared to make it difficult to establish and maintain relationships with diverse children; in this case, children whose home language was not English or had special educational needs. The findings of the present study and the applicability of the continua and model suggested might have been strengthened had these children been active participants. It could be that a different study, focused on the imperative to create curriculum from children's needs, might be more relevant to these children. Attention to the funds of knowledge of diverse children and their impact on a co-constructed inquiry curriculum is worthy of future research attention and may also benefit from a researcher being immersed in the case study context.

Interviews with children

The interviewing strategy relied on children's ability to recall their interests at home and at the centre. The four-year-olds in the study were articulate and clear about these. However, as a metacognitive constraint, the toddlers found recalling favourite self-chosen activities difficult until photographs were used as a stimulated recall item. In effect, these photographs were my interpretation of their centre interests, and their perspectives may have been different. The toddlers and some young children were also subjected to the well-meaning contribution of older siblings during the interview. Using interviews relies on self-report and is a common limitation in qualitative studies. However, in this study, such self-report has been triangulated with the views of others and the actual practices in centres and homes to mitigate this limitation.

Parents' contributions and positioning

The design of the present study did not position parents centrally in the same way as teachers and children. This was partly because they were not a strong presence in centres on a daily basis and partly because the explanatory framework of funds of knowledge was identified subsequent to the research design and methods being selected. Given their importance in children's lives, and the philosophy of partnerships between teachers and parents in early childhood education, this is a limitation that would need to be remedied in further studies focusing on funds of knowledge by placing parents as central participants too.

Suggestions for future research

Research in early childhood education has revealed much about the ability of the early years of life, and high quality experiences during this time, to contribute towards realising children's potential. However, the focus on the early childhood years as being foundational and crucial to children's later lives is relatively recent. As the limitations of the study suggest, there is still much research that needs to occur in varying cultural contexts to further explore children's and teachers' interests, inquiries and funds of knowledge in order to inform cultures and societies about ways to assist children to reach their potential.

Consideration of the limitations, alongside the findings, of the present study suggest that the following topics could be usefully further investigated.

- the nature of and precursors to inquiry in infants;
- children's funds of knowledge in pedagogical relationships (including a more central positioning of parents) in a range of diverse learning communities; and
- teachers' engagement with parents and children's funds of knowledge in diverse communities.

Further, Hedegaard and Chaiklin (2005) note that there is no conceptualisation in González et al., (2005) of how to relate local content (i.e., funds of knowledge) to academic concepts. Given the link between everyday and conceptual learning proposed by this thesis, and the suggestion this is currently overlooked in current early childhood curriculum, future research could usefully investigate this relationship.

Final words

Rogoff (1990) identified three human urges: "to connect with others (social), to understand the world (intellectual), to reveal oneself within it (personal)" (p. 46). Lindfors (1999) suggests these urges are all present during a child's first year but take time to co-ordinate in inquiry situations. The present study argues that to develop knowledge of the world and develop one's identity as a learner, experience, information, collaborative knowledge building and action in a spiral fashion (Wells,

1999) are required to capitalise on the interests and inquiries humans possess that arise in the contexts of funds of knowledge in families, centres and communities.

Learning is about making connections between different forms of knowledge and experience. Teaching is about making connections with learners' prior knowledge and experiences and extending these. Engaging with learners' interests involves commitment from both learners and teachers and invites them to contribute to a co-constructed curriculum. Learning is maximised when teachers and learners intentionally co-constructing meaningful inquiry that links to their prior knowledge and interests.

A funds of knowledge approach provides a framework for understanding children's lives and the potential of their families, communities and cultures to influence their interests, inquiries and knowledge building. It also allows recognition of children's interests, inquiries, knowledge building and working theories in a deeper way than a surface level examination of their play activities in an early childhood centre affords. Therefore, identifying funds of knowledge as a theoretical framework to explain children's interests provides a new means to demonstrate ways in which children learn consistent with sociocultural theory. Teachers' knowledge can be viewed similarly. Funds of knowledge form a way to explain the range of evidence that teachers draw upon in their planned and spontaneous curriculum and pedagogical decision-making.

This thesis argues that a mix of formal (conceptual) and informal (everyday) knowledge combine in participatory learning and a co-constructed interests-based curriculum. The shifting nature of children's and teachers' knowledge can be viewed through the community of inquiry framework. Wells' (1999) spiral of knowing, incorporating working theories, provides a focal point for both a sociocultural curriculum and direction for inquiry and research-based discourse among teachers. Similarly, as children and teachers engage with working theories to develop their knowledge in a spiral fashion, the metaphor increases in validity as a way to assess and plan for children's learning consistent with sociocultural theory.

Furthermore, according to Wells, the outcome of knowing is action. Understanding children's inquiry from a funds of knowledge perspective has the potential to

transform early childhood education, and therefore, has important implications for understanding the nature of children's interests. These may be viewed as linked to their attempts at authentic meaning making through self-motivated inquiry. In turn, this had important implications for the changing provision of early childhood learning environments, curriculum and pedagogy, and teachers' professional knowledge and learning to acknowledge these.

As a final word, the importance of understanding children's funds of knowledge and utilising these as building blocks for curriculum and conceptual knowledge construction is perhaps highlighted in Corsaro's (1985) closing statement, a thought still relevant 22 years later:

Adults can learn much from children. We can learn about the creative nature of spontaneity, the exuberance and awe of confronting a mysterious world, and the sheer joy of sharing our lives with others. To understand socialization, adults must see, hear, and appreciate the everyday life-worlds of children (p. 307).

Epilogue

Jack's mother provided the following updates about him by e-mail on June 20 and 26, 2007, in response to a summary of findings and, later, a draft of chapter six of the thesis sent to the family. These further illustrate the ongoing, and changing, nature of children's inquiry-based interests.

20/06/07

In his third week at primary school and seems to be loving it. Still passionate about boats. Came home with a drawing of one today. His drawings of boats have always included (and focussed on) propellers, rudders, funnels and smoke from engines. He is also very interested in cars. Went through a phase of learning and naming all the car types he saw and asking whether they were diesel or petrol, automatic or manual, rear or front wheel drive. He would turn over matchbox trucks and comment on whether they had a driveshaft. We bought a new car during this period (which was diesel).

Characters are significant at the moment. He got a \$1 toy rubber chameleon for his birthday and is obsessed with it. It went to school in his pocket for the whole first week until we decided chameleons shouldn't be in school. He tucks it into its own cotton wool bed in a box every night and gets very distressed if he loses it. On the beach this week rather than play ball with me he was being a chameleon lying in the sand and scuttling forward with a very accurate chameleon-like quick pace then stopping very still. He saw one in real life at the zoo last week.

Some of Jack's first story writing at school includes reference to boats. Unfortunately the books are at school so I can't relate exactly what he wrote.

Hopefully that gives you a bit of an update.

Good luck with your project completion.

26/06/07

Thanks so much for that. It made for fascinating reading and took us back to a much younger Jack.

One thing for us that loomed very large in Jack's life at that time, which seems relevant to your thesis, was his extended obsession with Titanic and how the kindergarten teachers used that interest to get him doing other things at kindergarten.

His obsession (which lasted for over 6 months between the ages of 3 1/2 and 4) began with a blow up slide he went on in the Viaduct Basin one day. The slide was supposed to be the deck of Titanic as it tilted and sank.

Jack and his Dad went on it and it started a discussion about the ship that hit an iceberg and sank. We decided to get out the DVD and we watched selected parts with him. It was amazing how much there was in the DVD for him - submarines going down to look at the wreck, close up images of the propellers rising out of the water, the engines being increased to full steam ahead by the helmsman changing the telegraph on the bridge then down to the impact that 'Full Steam Ahead' had on the men feeding coal to the boilers in the engine room.

We ended up buying a DVD and it still gets watched occasionally now. We also have books about Titanic and other shipwrecks (gifts from Grandparents).

Theresia recorded in his portfolio Jack doing news at kindergarten.

"He told us all at news time on the mat, how Titanic had actually sunk by filling with water, tipping so one 'stern' was up out of the water, snapping in two, and again tilting up as it was pulled to the bottom. He described how it came to rest on the bottom in two pieces."

Theresia then used this interest in Titanic to encourage Jack to do new things. His portfolio has a record of him making a wooden Titanic boat and over a month later bringing it back to kindergarten for some modifications (another funnel). Theresia also used the Titanic obsession to get Jack drawing - something he'd never been much interested in. The drawings we have from that period are my most treasured drawings from his time at kindergarten. There is a Titanic series (over 15 I would guess). They mostly focus on the funnels, with smoke and propellers with churning water. There is also one in his kindergarten portfolio of the submarines - including his first written word (other than his name) 'submarine'. Titanic was also one of his first written and recognised words. He saw 'Titan' on a crane in the city.

You may have heard some or all of this but I thought it worth mentioning because we would still describe it as the most significant obsession in his life to date - even surpassing his current obsession with the chameleon!

I will stop now. I imagine you can't get parents to stop once they start talking about their children!

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APPENDICES

Appendix 1 Teacher participant information sheet

[Printed on Massey University departmental letterhead]
[Logo, name and address of Department/School/Institute/Section]

Dear teachers of (names of centres)

Thank you for your interest in my research topic. I now formally invite you to consider participating in a research project for my PhD degree at Massey University. This project will investigate how teachers build a curriculum based on children's interests. I expect that the information will be of interest to the professional and research communities of early childhood education.

Please read the enclosed information sheet carefully. If you consent to participation, please keep the information sheet and return the signed consent sheet to me.

If you have any questions or wish to know more before deciding whether or not to participate, please do not hesitate to telephone me on 623 8899 ext 8606, or contact me by email at h.hedges@auckland.ac.nz.

Thank you for taking time to consider this project.

Yours sincerely

Helen Hedges

Title of project: **Inquiring minds, meaningful responses: Early childhood communities of inquiry**

Participant information sheet for **teachers**

Researcher's name: **Helen Hedges**

I am a PhD student at Massey University. I have had 12 years experience in early childhood teacher education and am currently employed by the Faculty of Education at the University of Auckland. You can contact me by telephone 623 8899 ext 8606 or by e-mail h.hedges@auckland.ac.nz.

Project supervisors' names: **Judith Loveridge, Joy Cullen and Barbara Jordan**

My research project is investigating what it means in practice for teachers to build a curriculum based on children's interests. I am inviting the participation of teachers in selected centres. It will be preferable for the project that all teachers agree to participate, but this is not essential. However, a minimum of two teachers in each centre will need to agree for the project to go ahead. Following teachers' agreement to participate, some parents and children in each centre will also be approached for participation.

To enable me to undertake this investigation, I plan to spend a half-day each week this year in your centre as a participant-observer. I might also attend other occasions, such as curriculum planning meetings. I am aware that teachers having researchers in the educational setting is a further event in the busy daily life of an early childhood centre. I will respect the routines and policies of your centre and allow you to continue in your roles without inconvenience. Special care will be taken not to interrupt the teaching and learning interactions and relationships between teachers and children during the research process.

There will be no pressure to participate and your participation will not affect your employment or the programme that you currently provide for children in any way. No changes to the learning and teaching environment will occur for the purposes of data gathering for this research. I would appreciate you talking to the children about my project, explaining that I will be spending some time each week in the centre and that it is acceptable for them to talk to me.

There will be two phases to the project, each taking approximately 5-6 months of time.

If you agree to participate, you will be involved in the following ways:

Phase one of the study:

- gathering data about children's interests during learning and teaching interactions with teachers and peers (e.g., curriculum documentation, photographs, videotapes – the actual techniques will be negotiated with you). This data, including any videotapes, will be used during the group meetings that happen during phase two of the study.
- participating in one individual and one team interview, of approximately one hour duration, at a time and place negotiated with you. Transcripts of these will also be used during the group meetings that that happen during phase two of the study.

Phase two of the study:

- participating in between four and six group meetings with another team of teachers, for approximately two hours at a time, to analyse the data, share results and findings and consider the implications of the findings for teachers' professional knowledge and development
- engaging in individual and/or collaborative journal writing

Because the project will take up most of one year, I would continue to be sensitive to your time involvement and commitment to the project and negotiate issues related to the demands of the research on an ongoing basis throughout the year.

All data gathered will be kept in a locked filing cabinet at my home. You will have the opportunity to read and check the written transcripts of the interviews before analysis of the data. All the data will be used to answer the project's questions and write a report. The data and findings may also be part of a future conference presentation or journal article or used for teaching purposes. You will be consulted about the findings during the writing of the report and be provided with a summary of the project's findings. In addition, your centre will be given a copy of the full thesis.

Anonymity cannot be guaranteed because of the use of group interviews. However, to protect confidentiality, each teacher will be asked to sign a confidentiality clause as part of the consent process. The interviews will be taped and transcribed by someone not associated with the research who will also sign a confidentiality clause. Transcripts of the interviews will be confidential to my supervisors and me. Unless you choose to have your name used, pseudonyms that you choose yourself will be used in the research report.

To summarise:

You are under no obligation to accept this invitation to participate in my project. If you decide to participate, you have the right to:

- *decline to answer any particular question;*
- *withdraw from the study at any time until all the data has been gathered;*
- *ask any questions about the study at any time during participation;*
- *provide information on the understanding that your name will not be used unless you give permission to the researcher;*
- *be given access to a summary of the project findings when it is concluded.*
- *ask for the audiotape to be turned off at any time during the interview.*

This project has been reviewed and approved by the Massey University Human Ethics Committee, PN Application 04/64. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Campus Human Ethics Committee: Palmerston North, telephone 06 350 5249, email humanethicspn@massey.ac.nz.

Thank you for taking time to consider participation in this project. Feel free to approach my supervisors or me if you have any questions. My supervisors can be contacted at the Department of Learning and Teaching, Massey University, Private Bag 11 222, Palmerston North. My chief supervisor, Judith Loveridge, can be contacted by telephone 443 9700 ext 8957 or by e-mail j.loveridge@massey.ac.nz.

Appendix 2 Teacher consent sheet

[Printed on Massey University departmental letterhead]
[Logo, name and address of Department/School/Institute/Section]

Project title: Inquiring minds, meaningful responses: Early childhood communities of inquiry

PARTICIPANT CONSENT FORM

Teachers involved in project.

This consent form will be held for a period of five (5) years

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree/do not agree to the interviews being audio taped.

I agree/do not agree to being photographed and video taped.

I agree that the edited interview transcripts and extracts from transcripts may be used in reports and publications arising from the research or for teaching purposes.

I agree that photographs and edited extracts from the videotapes may be used in reports and publications arising from the research or for teaching purposes. I understand that I will have the opportunity to view videotape extracts prior to public viewing.

I agree to not disclose anything discussed in the shared interview or discussion and inquiry group.

I agree to participate in this study under the conditions set out in the Information Sheet.

Signature:

Date:

Full Name - printed

Appendix 3 Parents' and children's participant information sheet

[Printed on Massey University departmental letterhead]
[Logo, name and address of Department/School/Institute/Section]

Dear parents/whānau, caregivers and children of (names of centres)

Thank you for your welcome. I have enjoyed getting to know many of the children and parents that attend the early childhood centre over the last week or two. I now invite you to consider participating in a research project for my PhD degree at Massey University. This project will investigate how teachers build a curriculum based on children's interests. I expect that the information will be of interest to the professional and research communities of early childhood education.

Please read the enclosed information sheet carefully. If you consent to yours and/or your child's participation, please keep the information sheet and return the signed consent sheet to one of the teachers.

If you have any questions or wish to know more before deciding whether or not to participate, please do not hesitate to chat to me when you see me at the centre, telephone me on 623 8899 ext 8606, or contact me by email at h.hedges@auckland.ac.nz.

Thank you for taking time to consider this project.

Yours sincerely

Helen Hedges

Title of project: **Inquiring minds, meaningful responses: Early childhood communities of inquiry**

Participant information sheet for parents and children

Researcher's name: **Helen Hedges**

I am a PhD student at Massey University. I have had 12 years experience in early childhood teacher education and am currently employed by the Faculty of Education at the University of Auckland. You can contact me by telephone 623 8899 ext 8606 or by e-mail h.hedges@auckland.ac.nz.

Project supervisors' names: **Judith Loveridge, Joy Cullen and Barbara Jordan**

My research project is investigating what it means in practice for teachers to build a curriculum based on children's interests. I am inviting the participation of teachers in selected centres. Following teachers' agreement to participate, parents and children in each centre are now being approached for participation.

There will be no pressure to participate and your participation will not affect your children's learning experiences in any way. No changes to the learning and teaching environment will occur for the purposes of data gathering for this research.

If you agree to participate, you will be involved in the following way:

- participating in an interview with your child, of approximately one hour duration, at a time and place negotiated with you, about your child's interests and learning

If you agree for your child to participate, s/he will be involved in the following way:

- as a participant in the gathering data about children's interests (e.g., curriculum documentation, photographs, videotapes). This data, including any videotapes, will be used during the group discussion meetings with the teachers that happen in phase two of the study.

If you have also agreed to be part of the study, your child (age permitting), will also be involved in the interview mentioned in the first bullet point in the following way:

- participating in an interview with you, of approximately one hour duration, about his/her interests and learning. A transcript if this interview will be used during the group discussion meetings with the teachers that happen in phase two of the study.

I would appreciate you talking to your child about my project, explaining that I will be spending some time each week in her/his centre and that it is all right for him/her to talk to me.

All data gathered will be kept in a locked filing cabinet at my home. You will have the opportunity to read and check the written transcripts of the interviews before analysis of the data. This data will be used to answer the project's questions and write a report. The data and findings may also be part of a future conference presentation or journal article or used for teaching purposes. You will be consulted about the findings and be provided with a summary of the project's findings. In addition, your child's centre will be given a copy of the full thesis.

The interviews will be taped and transcribed by someone not associated with the research who will also sign a confidentiality clause. Transcripts of the interviews will be confidential to my supervisors and me. Unless you choose to have your name used, pseudonyms that you choose yourself will be used in the research report.

To summarise:

You are under no obligation to accept this invitation to participate in my project. If you decide to participate, you have the right to:

- *decline to answer any particular question during the interview;*
- *withdraw from the study at any time until all the data has been gathered;*
- *ask any questions about the study at any time during participation;*
- *provide information on the understanding that your name will not be used unless you give permission to the researcher;*
- *be given access to a summary of the project findings when it is concluded.*
- *ask for the audiotape to be turned off at any time during the interview.*

This project has been reviewed and approved by the Massey University Human Ethics Committee, PN Application 04/164. If you have any concerns about the conduct of this research, please contact Professor Sylvia V Rumball, Chair, Massey University Human Ethics Committee: Palmerston North, telephone 06 350 5249, email humanethicspn@massey.ac.nz.

Thank you for taking time to consider participation in this project. Feel free to approach my supervisors or me if you have any questions. My supervisors can be contacted at the Department of Learning and Teaching, Massey University, Private Bag 11 222, Palmerston North. My chief supervisor, Judith Loveridge, can be contacted by telephone 443 9700 ext 8957 or by e-mail j.loveridge@massey.ac.nz.

Appendix 4 Parent consent sheet

[Printed on Massey University departmental letterhead]
[Logo, name and address of Department/School/Institute/Section]

Project title: Inquiring minds, meaningful responses: Early childhood communities of inquiry

PARTICIPANT CONSENT FORM

Parents involved in project.

This consent form will be held for a period of five (5) years

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree/do not agree that my child be included as a participant in this project. (Please note that age and maturity permitting, children will be approached to give consent themselves to complement parental consent).

I agree to the interview being audio taped.

I agree to my child being photographed and video taped in the early childhood centre.

I agree that the edited interview transcript and extracts from transcripts may be used in reports and publications arising from the research or for teaching purposes.

I agree that photographs and edited extracts from the videotapes may be used in reports and publications arising from the research or for teaching purposes. I understand that I will have the opportunity to view and approve videotape extracts prior to public viewing.

I agree to participate in this study under the conditions set out in the Information Sheet.

Signature:

Date:

Full Name - printed

Appendix 5 Child consent sheet

[Printed on Massey University departmental letterhead]
[Logo, name and address of Department/School/Institute/Section]



Title of project: **Inquiring minds, meaningful responses: Early childhood communities of inquiry**

Researcher's name: **Helen Hedges**

My name is: _____
(please print your name in the space)

I have talked with Helen about why she is at (name of centre). I am happy/not happy to let her watch me playing with and talking to teachers and children.



(please colour one)

I am happy/not happy to have her or the teachers take photos and videotape me playing.



(please colour one)

I am also happy/not happy to talk to her and my Mum or Dad at my home about things I like doing. I am happy/not happy to let her tape the talk we have at home.



(please colour one)

Child's signature:

Appendix 6 Fieldnotes extracts

No. 1 Kindy, extract pp. 172-173, Day 30, 30 September 2005

After morning tea, Angela and Kylie want to gather the children on the mat in the art room to go for a walk to the school field. Safiya is asked to wash her face again by Angela. When she has finished, she asks me "where's Imogen?" I tell her getting ready for a walk. Angela tells the children they will need to walk with a partner, listen carefully for cars and that they need their shoes on. Some are asked to go to the toilet and Danyela's nappy is changed. Amelia returns "I went to the toilet Kylie!" Kylie offers to read Pukunui while they are waiting and asks the children whose book it is. They know that it is Keryn's. Amelia "I got a fat tum" - clearly familiar with the book. But the reading is short-lived and the children get ready to go for the walk. Safiya grabs Immy's hand and they walk together. Immy tells Safiya not to go on the road or she will bump her chin like Claire. Safiya tells her that her sister turned the TV off and pushed her onto the floor. Immy "Oh no!" They are directed to walk up the footprints in the school driveway. Immy to Safiya "we go to school, we big girls." When we arrive at the field, they race off running. They play various running and chase games and always return when Angela calls them. Immy falls down quite early and Angela says "hold my hand, come on Immy, you can do it!" She happily repeats the running again with Angela's support. [Girl] and Luca find daisies on the field. Angela encourages them and other children to pick some. Immy goes to show [Girl] her daisies, clearly intrigued by the similar names. They sit on the hill to look at them. Then Immy says "I see forest" and they run over to the tree and bamboo area. [Boy] suggests there is a monster there and they go onto the tracks to walk and look. Danyela names various creatures from Land before time to Angela suggesting they might be there too. [Boy] sings "we're going on a monster hunt." They develop this game with Angela who then suggests it might be Pooh Bear and the children name other characters from these stories. [Boy] leads the group down another track. Angela runs ahead and says Boo to pretend to be the monster. The group start running again with great enjoyment. Angela leads them "we're going on a lion hunt .." and then asks "Immy, what happens on the lion hunt?" Immy doesn't answer but starts singing it herself. Safiya invites me in among the bamboo. As we walk, Immy tells me the lion is sleeping. I say I will check behind this tree. As I do, I roar and they run off laughing out onto the field. Angela calls "you can't catch me" and the children run around the field again. Immy find a piece of sponge on the grass, picks it up and wipes it against her face "fluffy." She drops it, Safiya picks it up and copies her and then they run off. Angela rounds the children up on the hill and re-partners them to begin the walk back. Immy doesn't want to hold Safiya's hand. She comes to me "I hold your hand" and I suggest she holds Safiya's with her other hand. She points out that she has daisies in that hand. The reliever takes Safiya's hand and Safiya doesn't argue. The children walk back. I have Immy and [Boy] who enjoy spotting the yellow feet signs and jumping on to them. They go back into the art room and sit looking at books while Angela gets them a drink of water. Angela asks them to each individually put their cups in the kitchen sink. Immy runs outside and sees Barbara in the sandpit. She tells Barbara about the trip and the monster hunt. [Boy] joins in and talks about the lawn mower that wasn't working. Aidan sees me and comes over "pen pen pen." This is the first time this has been repeated during the morning, rather than it being the arrival ritual, but we have just returned from being away (so is like arrival?). He draws and then points to the wood nearby saying "paper?" I tell him the pen won't work on the wood, only on the paper. He draws/writes again then points to the wood again. I repeat what I said and comment that although paper is made from wood, this might be a bit complicated for you right now. Barbara laughs. He draws again then gives me the pen "tak you" and heads off towards the rabbit cage again. Foo Foo [rabbit] is sitting on top again. Aidan reaches out to her and Foo Foo pounces, sensing unfriendly toddler behaviour. Aidan jumps back and goes over to the rocking horse nearby where he stands and looks at the rabbit. Foo Foo runs away. Aidan goes over to the cage, opens the door and plays with the food and water containers. I alert Barbara as she is closer this time and she empties out and refills the food and water containers with him.

Takapuna Kindergarten, extract pp. 37-39, Day 8, April 11

At morning tea, I sit and chat with the children there (relationship-building). Zach likes the little crackers today and eats lots of them, Caitlin tells me she has been drawing today "some persons and some smiley faces". Zach says "I was drawing too. I might do some climbing now". I ask Gina if she knows my name. Caitlin "That's Helen". I tell her that I'm interested in what children like to do at kindergarten and that I like to write stories and take photos. I ask her if it is all right if I write stories about her and she nods enthusiastically. Caitlin says "You draw pictures in your book too" and tells me that Gina was bored at afternoon kindy because she and Harry were already at morning kindy, but now they are here they can all be friends again. I ask Gina what she likes to do at kindy but Caitlin answers first. "I like doing puzzles and drawing". Gina "I love drawing too and sticking things and painting". I check if 'sticking things' = collage and she says yes. Gina "I wish I lived in Australia. (why?) because there's lots of zoos there. (Do you like animals?) yes". Caitlin "I wish I lived in Malaysia ... because we lived there .. my cousins are there. Their Daddy is my Daddy's brother." I ask if the top she is wearing is from Malaysia, but she says it's from Australia. I go outside with them when they finish morning tea and they run around, backwards down the hill, telling me to watch them etc. They then move to the table with the face paints and paint their own hands etc.

Tom's rope efforts have moved to the swing area. Christine has tied the rope through a tall eyelet, but Tom is the boss. Greta tells me "Helen, I'm learning to skip, that is my challenge", Tom "Well climbing is my challenge". He chooses who will have the next turn, demonstrates and gives instructions about how to climb etc. To me "This is my plan climbing up the pole". He tells me that Christine helped him. "She said 'that's a good idea, that's a good idea'".

Shannon is threading and rethreading/tying his string and gets it in a knot. I show him how to follow the thread and loosen it off to see where to go. He is tentatively watching Tom and the others as he does this. (Is his string tying a re-creation of what he sees?) I ask "Have you been watching Tom and the other boys?" "Yep". (Why don't you come over and watch them closer and get a turn?) "Cos I'm not friends with them and I don't want to play with them. Sometimes I do and sometimes I don't." (You need to spend time with them to be friends.) "I already know that. You learn about people's names and stuff about them and that's how you make friends." He watches for a while again. (Come on let's go have a closer look. Come with me.) He follows me halfway, then "I've just got this to do" and returns to untying the string. This is when Gina and Caitlin return to me so I ask Angela (ST) to follow up with Shannon. Eventually he gets over there but Angela reports that he says he will do it tomorrow and that he doesn't want a turn on that rope, he wants to do a different rope.

Christine is reinforcing that Tom is in charge "It's not up to me who goes next, it's your decision" as some boys argue about turns. This is tricky for Tom to manage "I'm the one that says, it was my idea, I'm the boss of it and that's fair". Gina and Caitlin go by on the trolley. Caitlin tells me her challenge is the monkey bars and we go there where she has several turns at it (photo). Theresa and I praise her each time. The effort in her face tells the story. She is also watching the boys so I suggest that she go and look and maybe have a turn too, she could be the first girl to do the big rope climb. She does so, sitting on the box for a turn. Christine is still making her way through the boys who clamber closer and are noisy turn-waiters so I eventually quietly point out that she is waiting for a turn to be the first girl to do it. She does so and makes a great effort! (photo) Real determination, grit and pride is evident. The kindy camera has run out of battery so I have become chief photographer of all the children here. Tom returns, wanting to know "Why does everyone want a turn?" I suggest it might be because it was such a good idea (repeating what he said Christine told him earlier). He asks C the same question and she says perhaps he should ask the children waiting. Trent says because he hasn't done it before (photos). Dylan initiates a repeated support chant "You can do it Trent!" that the group takes up. Christine notes that she needs someone like me recording all the time as this has exploded in four directions and "it wasn't on my agenda today!" (Later says that updating challenges was [the agenda] which explains why the children are talking about these.) One of the extension ideas is that a large group is playing tug-of-war. The two teams organised themselves in boys and girls and the girls are repeatedly winning! (photos) Dylan and Tom have the last turns on the rope climb before tidy-up (photos).

Appendix 7 Analytic memo re fieldnotes

THE BODY (May 15, 2005)

Physical challenges and extending the body's physical capabilities are themes coming through constantly as an aspect of children's interests. Fieldnotes and photographs provide much data to support this.

I mentioned this in an e-mail to Judith and sent the collection of photographs of Immy swinging captured on 15/4/05 (see also 22/4/05 & 6/05/05). She commented that the importance of increasing professionalism in early childhood has swung the emphasis towards cognition and that perhaps physical aspects were being less noticed. She recommended a chapter by Tobin or Walsh in Briesler (Ed).

In addition, much teacher conversation at children's mealtimes is about healthy eating and nutrition.

However, it was not until May 13 that I realised it's perhaps not just physical activity that children are interested in, and their ability to co-ordinate and extend movement capabilities, but more broadly how their bodies work and the physical/biological nature of this.

Excerpt from fieldnotes May 9:

Caitlin and Gina have now climbed on the metal bars and tell me to look at them. Caitlin says her challenge is still the monkey bars but Gina's is doing somersaults over the bars. Gina tells me that she could do the monkey bars when she was three. They engage in some silly talk and showing off and I tell them that I am going back inside to see the next part of the project. Caitlin follows me.

15/5 Oh dear! If there was ever an example of poor researcher interpretation, this has to be it! Feeling firstly that it was "silly talk" and later frustrated with the slow speed of the voice recognition software, I did not record the conversation between Caitlin and Gina on the metal bars in full in either the notebook or fieldnotes while my memory was fresh, not recognising its significance in terms of children's interests at that stage. The conversation was about doing farts and burps at home and at kindy. Caitlin talked about doing farts in bed in the morning and Gina talked about burping after you've eaten. Similarly, while Leah, Greta, Caitlin and Gina were engaged in the drawing, writing and making that is recorded here in full, Leah had also been telling all of us that she has done seven poos on the toilet. She told us she got a pencil for school when she did the second one. I wondered at the time if this was linked to the theme of growing up, difficulties doing so and receiving encouragement and incentive from adults, but again chose not to write this up initially not recognizing its significance.

Why did I wake up?

Excerpts from fieldnotes May 13:

(Children are at mat time before morning tea). Immy (2:3) then points out caterpillar poos to Danyela (2:2) excitedly (it probably just excreted out of fright from its recent near-miss death experience) and Danyela says "poo" six times then to Wendy "done poos", no response (she is reading a book to the group), to me "caterpillar done poos" and I nod. It is time to wash hands for morning tea. (Full story of Immy's caterpillar recorded elsewhere).

(Children are getting ready for lunch, sleep time is directly afterwards). Wendy is with the children in the bathroom. Immy “I go wees” and sits on the toilet after Wendy takes her nappy off. Danyela “I go wees too” and sits up too. Immy takes paper and wipes herself even though she hasn’t weed. Danyela “poos poos” but it appears someone earlier didn’t flush, they are not hers. She and Immy grin at each other and Immy says to me “We go toilet.” Wendy takes Immy to put a nappy on. Immy wants a pull-up but Wendy tells her she has those at home, she has nappies at kindy. She tells her to wash her hands, she says she has, Wendy tells her you have to wash your hands after doing wees so she does so again before going into the table for lunch. Danyela likes watching the toilet flush a couple of times then gets a nappy on, washes her hands and goes to lunch too.

(The older children 3-4 year old lunch time) Claire asks Luca and Gianni not to lean back on their chairs as they might fall back and hurt their heads. [Three girls] have a conversation: R. “You lose lots of blood.” H. “Blood makes the body work.” J. “No the heart makes the body work.” and they point to where their hearts are. R. points to her throat making gurgling noises “and there’s a voice box in here.” ... Claire encourages the poorer eaters to eat a few mouthfuls explaining they will feel tired and grumbly later on if they don’t.

I am now realising that

- the body could be viewed as an improvable object?
- there is a potential to co-construct a community of inquiry through links/connections happening here: children’s interests in their bodies and teachers’ provision of physical activity in the environment and their interest in children’s nutrition
- that Takapuna Kindergarten’s focus on physical rather than cognitive challenges may be spot-on, but can they explain why?

What do we all know about anatomy, physiology, nutrition, physical activity and its benefits? Is the body being ignored in early childhood despite its necessary involvement in a holistic view of the child? (Must read Briesler book).

Appendix 8 Teacher individual interview schedule

- How, why and when did you get involved in early childhood teaching?
- Describe your philosophy of teaching.
- What “people, places and things” have been important in your development as a teacher?
- What personal and professional qualities and knowledge does an early childhood teacher need?
- What does the term “children’s interests” mean to you?
- Tell me about your curriculum planning approaches in relation to children's interests.
- Please tell me about a time when you participated with children in a spontaneous activity that they initiated and the children's interests that were part of this.
- Can you think of another similar occasion?

Appendix 9 Teaching team interview schedule

- When a child first starts at your centre, what do you find out about them from asking them or their parents?
- Re-visit ideas about children's interests raised in individual interviews.
- Why do you think *Te Whāriki* suggests curriculum should be built on children's interests?
- How are children and families involved in curriculum and pedagogy?
- What professional knowledge do you think teachers need to know about to engage with children in planned and spontaneous experiences based on children's interests?
- Are children's interests enough to base curriculum and pedagogy on? What other things influence your curriculum planning and pedagogical interactions? Do you ever choose to do things with children to encourage or stimulate an interest?
- What role (if any) do theory and research play in your curriculum planning and teaching practice?

Appendix 10 Child and family interview schedule

With children:

- What kinds of things do you like to do it at home? What do you play with? Who do you play with? What things do you do with people in your family? (probe – people, places, things)
- Can you think of anything you've learned to do at home before learning it at (name of centre)? How did you learn that? (probe – people, places, things)
- What kinds of things do you like to do it at (name of centre)? What do you play with? Who do you play with? What things do you do with your friends?
- What special things are you really interested in and know a lot about? How did you get interested in these? (probe – people, places, things)

With parents:

- What kinds of interests does your child/ren have at home? At the centre?
- What special things is s/he really interested in and know a lot about? How did s/he get interested in these? Who are other special people in your child/ren's life that s/he/they spend time with? (probe – people, places, things)
- What things do you do as a family that s/he really enjoys?
- Do you ever choose to do things with (name of child) because s/he has shown an interest? (probe – examples) Do you ever choose to do things with (name of child) to encourage or stimulate an interest?
- What things do you want (name of child) to experience or learn while at (name of centre)?
- Do you think that teachers working with your child's interests, along with the interests of other children at the centre, will help him/her learn those things?

Appendix 11 Analytic memos re child and family interview

Caitlin and Kathryn [surname] (& Thomas - 6 year-old brother) (20/3/05)

A large, two-storey home up a long drive, set among native and other trees, very peaceful setting. Swimming pool off family/lounge area. Renovated kitchen and dining area is venue for interview. I re-explain my project to Caitlin. She happily completes the consent sheet with her Mum's guidance about spelling her surname. She smiles broadly and giggles when she hears her voice on the sound check. She answers questions shyly at first but also enjoys the interview. Her Mum is very friendly and participates well too.

Thomas sits on a couch and listens to the interview intently, then begins to participate, much to Caitlin's indignation/annoyance. Unfortunately he is sitting too far away for the tape to pick up much of what he says as it was interesting, and Kathryn supports Caitlin in asserting that this is her interview. Nevertheless, it becomes clear that some of Caitlin's interests have been stimulated by her activities with Thomas and his friends, for example, attending his team's soccer practice as [father] coaches the team. Parents own the [company name] (Kathryn previously fitted out super yachts) and Caitlin had a nanny for nearly four years and more recently another who has been picking her up from kindy since I've been going.

After the interview, Kathryn re-offers me a cup of tea (I had refused earlier as I find managing the interview enough without refreshments near) and I almost accept as I feel very comfortable here, but I think it might have also been politeness as they were also getting ready and packing for a trip to Rotorua and then Coopers Beach. I am also mindful of getting too close to participants and crossing the line between rapport and 'fake' friendship (see Mauthner et al, 2002). While I note this as evidence about the importance of authentic relationships and genuinely appreciate these families opening up their lives to me, I need to be clear about boundaries with them and with myself.

Talk of [Nanny] reminds me that [Lucy and Billie's mother] talked about the differences between the two nannies that Lucy and Billie had as influences on their learning and development. Nannies likely contribute their own funds of knowledge to children's interests?

Jack and Rachael [surname] (& George, new baby brother) 29/6/05

A large, two-storey, well-appointed home. Outside, there is a dinghy and a rowboat in a covered area. I comment to Rachael that I can see why Jack knows a lot about boats already. She laughs and tells me that there is a large motorboat in the garage (and little/no room for cars) and during the interview it also transpires that they are renovating an old boat/yacht. Although the home is very near Takapuna beach, it seems they do much of their boating and beach activities further north. Downstairs, a room is set out with children's play equipment. A train set and track is set up and there are many baskets full of toys and resources. Books, CDs and videos/DVDs are kept upstairs in the main family lounge. These, too, are plentiful. During the time together, Rachael tells me [occupations of her and Jack's father]. She asks Jack to tell me what is on the top of the building where [father] works and he laughs and tells me "a toilet seat". They are referring to the Vero building in Auckland City – and my travels over the Victoria Park flyover are never the same from then on as I notice this and smile to myself!

Jack comes downstairs to greet me wearing an apron, with his sleeves pulled up to the elbows and fastened with pegs. He begins chatting straight away, telling me he has been doing dishes. I tell him I thought he must have been hung on the washing line and he laughs. The pegs are Granny [Name's] idea to keep his sleeves up. As we sit down on the couch, Jack looks on my top and tries to look underneath it, asking me where my name badge is. I tell him I haven't worn it today because he knows my name. He grins and agrees. Rachael has told him why I am here and he is very keen to look at the tape recorder. He takes the prepared tape in and out several times and we do several voice checks that he is fascinated by.

He also takes the batteries in and out several times and has clear knowledge of which way they go in. However, despite both of us explaining that we are making a tape, during the interview Jack is unsure why he can't hear us on the tape. At one point, I stop it and do a quick rewind so he can hear it, but this doesn't help. He is more easily distracted than I thought he would be since he usually likes to talk about himself and what he's doing with adults. He continually wants me to read a book to him that was a Christmas present from kindy last year. I read it to him after the interview. After all, he is just three years old! At the end of our time together, Rachael has recognised his restlessness and suggests that they will go and run some of the energy off.

Despite interruptions and distractions, there is some lovely material here about interactions between mother and child that show how he has become highly verbal, intelligent and knowledgeable. For instance, (and I am not sure if this is on the tape), when we look at the photo and talk about Jack enjoying the cogs activity with Ruth, and I mention his interest in the batteries, Rachael asks him how batteries go in something and he replies that "the pointy bit goes on the spring and the flat bit goes on the plate". She comments that he must have learned this with his Dad as it is not something she has talked to him about. His interest in boats and building also comes from his Dad, but Rachael has fed into his knowledge of birds and animals for example. For his third birthday a month ago, they bought him a tool bench and tools that his Dad is currently setting this up downstairs for him so he can do some construction projects.

Rachael commented that his interests had changed in the last few months. A while ago she said she would have said trucks, cars and boats but now it is literacy-type activities, but that this could be connected to the fact that she is using books, CDs, videos and DVDs more than before to manage caring for a new baby alongside spending time with Jack. They have also picked up on the interest in construction that has come from the boat renovation and other projects of his Dad's with his recent birthday gift. I asked her if he tended to have intense but relatively short-lived interests, moving onto other interests, or maintained interests over a period of time. She said she hadn't thought about like that but that this was possible and worth watching for.

Yesterday afternoon was his first visit to Takapuna Kindergarten. Granny [Name] took him. He apparently went straight for the carpentry and stayed there most of the afternoon. He sawed right through a big piece of wood but Rachael seemed more impressed by this than Jack himself. He will continue to visit with his grandmother once a week until there is a space for him to start. Rachael returns to work four days a week next week. Jack will have a nanny for three days (an older woman who has had two sons herself; these two factors were what Rachael mentioned therefore are likely to be what she considered most important) and attend No 1 Kindy on Thursdays until called up for public kindy. Jack is friendly with [two girls] from kindy. I haven't met [Name] as she doesn't attend on Fridays. Jack seemed most surprised that I didn't know who she was as she is clearly very important in his life. When I asked Ruth later about this, she told me that they are apparently inseparable on Thursdays, and I note that [Name] is listed in the record of children's interests in Kylie's documentation as one of his main interests. This provides further evidence of the importance of children's friendships.

Appendix 12 Professional learning: Content of co-constructed dialogue and inquiry sessions

SESSION ONE:

The learning environment

(your wish list from 5/7/05)

- resourcing the environment
- examining assumptions
- looking at constraints
- considering choices
- considering changes and improvements

When first asked about the term "children's interests", most of you mentioned children's ability to choose from a well-resourced environment and engage in play and learning. For many teachers, a well-resourced environment means setting up the environment in terms of traditional "areas of play". (There is no doubt that both settings are indeed well-resourced for areas of play.)

Here are some questions to think about that we will discuss:

- What evidence do the fieldnotes contain of children's interests in particular "areas of play"?
- What assumptions are made about what constitutes "good provision"? Which areas of play are privileged in your environment? Why? Which areas are not privileged? Why not? (Consider teacher beliefs, priorities, time, space ...)
- What constraints are there on children's ability to choose? (See fieldnotes)
- What constraints are there on children's ability to use different areas in multiple ways and make connections between areas of play? (You may find sketching a floor plan and marking out different areas helpful here.)
- What constraints do the routines and regular events make on both children's choices and the duration of their play and learning? (See fieldnotes and consider your teaching 'roster' as a routine here too.)
- What messages might children be giving (or trying to give) in the fieldnotes about both choices and constraints?

Considering improvements and changes to your learning environment:

Curtis, D., & Carter, M. (2003). *Designs for living and learning: Transforming early childhood environments*. St Paul, MN: Redleaf Press.

I invite you to simply dip in and out of this book at the chapters that interest and inspire you. Deb and Margie include plenty of questions within these to get you thinking about ideas that you might try. (PS You will need to share this book between your two settings.)

Friedman, S. (2005). Environments that inspire. *Young Children* 60(3), 48-55.

Retrieved July 11, 2005 from

<http://www.journal.naeyc.org/btj/200505/04Friedman.pdf>

Friedman, S. (2005). Reflecting, discussing, exploring: *Questions and follow-up activities for environments that inspire*. Retrieved July 11, 2005 from <http://www.journal.naeyc.org/btj/200505/03Friedman.pdf>

As with Curtis and Carter, dip in and out of this and consider the questions posed by the author in the follow-up article.

Readings for discussion:

Hedges, H. (2003). Teaching and learning: Theories that underpin 'wise' practice in Aotearoa/New Zealand. *Early Education*, 31, 5-12.

What is the theoretical basis for play being the central vehicle for children's learning? Why is it important to understand theoretical bases for curriculum? Consider the questions on page 10 to discuss. (NB those on page 11 will come up in later sessions)

Walsh, G., & Gardner, J. (2005). Assessing the quality of early years learning environments. *Early Childhood Research & Practice*, 7(1). Retrieved June 14, 2005 from <http://www.ecrp.uiuc.edu/v7n1/walsh.html>

In the first three pages of this article, Walsh and Gardner make reference to various ways in which environments have been evaluated according to differing environment set-ups, priorities and valued outcomes. For example, there are various "environment rating scales" in existence as a result of the search for structural features of "quality". It is highly likely that both of your settings would score quite highly on these types of scales as they favour play-based environments with qualified teachers and lots of resources and equipment.

This article takes a different angle on the learning environment by attempting to assess the environment from the perspective of how children experience it. (NB Where they mention theory such as 'constructivist' or 'social constructivist', it is safe to interchange that for 'sociocultural' to make links to the curriculum and pedagogy promoted by *Te Whāriki*.) They value an 'experiential model' of learning that highlights children's participation and has as its goal "fostering a positive disposition toward learning" (p. 4). Indeed, some of the ways that they categorise children's experiences of the learning environment could be viewed as making links to dispositions, a key focus of *Te Whāriki* that we will explore more in our next session.

- What do you think of this model in relation to your team philosophy and approaches to planning?
- What do you think of the nine key themes identified? Do they resonate with what you think valued goals for children should be in your setting? How do they sit alongside *Te Whāriki*'s overall goal for children?
- What do you think of the matrix developed to analyse the data? (You now become another 'panel of experts' evaluating this!) How might you utilise the ideas of the matrix to assess your learning environment?

Examining taken-for-granted practices:

- Teachers actually provide the environment children subsequently choose from in their choice of resources, placement of these etc. We sometimes forget that the play environment is a cultural construction in the first place. (If you are interested in following this up: reference - Cannella & Viruru in Cannella, 1997). In what ways can you now see the privileging of some areas over

others? Can you see constraints and restrictions from children's perspectives? How does a 'free play' philosophy sit with understanding 'routines and regular events'?

- What might be alternative set-ups for environments? (e.g, Nursery classrooms based on the English curriculum might be set up as curriculum areas – Wendy and others who've taught there and elsewhere, be prepared to offer some thoughts please ☺) What could we learn/adapt/utilise from these approaches?
- If children had input into a completely different way of presenting the learning environment, a way that represented their interests, what might this look like?

Follow-up actions:

(NB We will add to, adapt, change these at the session)

- What might you ask children directly about?
- How can children be more involved in planning the learning environment?
- Which areas might you change position of?
- What other changes/improvements might you trial? (What inspired you from Curtis and Carter's book?)
- What kind of data would you collect to know if you were making a difference? (e.g., changes in the use of areas, follow a child for a day/week, looking at children's dispositions?)

SESSION TWO

Relationships and interactions with children: listening/dialogue/knowing children at an in-depth level

(Here's what you said you wanted to discuss – phew!)

- observing development
- current abilities and interests and how to use these to increase learning
- listening to children's conversations
- listening to and conversing with children
- having involvement with children (rather than just observing)
- building relationships with children to find out what they know and be able to extend that
- spending time with children to let them get to know the teachers, enabling children to trust teachers so (1) children will know they can offer suggestions and that these will be followed through; (2) children know they have a safe environment in which they can take risks
- harnessing the teachable moment and using the child's interests to do so
- professional judgment of child/ren as an entity, moving from one point to another point
- how to use children's interests as a vehicle for learning
- how to use children's interests to develop necessary/other areas of learning
- knowing the family
- knowing what's happening at home, e.g., family dynamics and functions

Examine individual portfolios (please gather together and bring along the diaries/portfolios of the research participant children to examine together)

- How well do they describe the child?

- What evidence do they provide that you know a child well?
- Do they meet the above purposes and reflect these aims?
- Getting to know children – the “Me” sheets – review and improve to strengthen home-centre connections, discuss intervals between updating these, discuss strategies to encourage parents to complete.
- What ever happened to home visits pre-kindergarten? What might they achieve? If they are not feasible, how can the same information be gathered?

Readings:

Hedges, H. (2004). A lesson in listening and thinking: Katie and her shadow. *The First Years: Nga Tau Tuatahi/New Zealand Journal of Infant and Toddler Education*, 6(1), 13-18.

As well as ‘slipping in’ more detail of (extremely relevant☺) sociocultural theory here, this article illustrates many of the points you raised about what it means to know a child well.

- What are the key concepts of sociocultural theory that could inform your practice?
- What professional knowledge and decision-making was involved in this interaction?
- Can you identify a recent occasion of an interaction with a child or children that you could write up similarly? (Are there examples in the fieldnotes?)

Jordan, B. (2004). Teacher talk: A tool for reflection. *Early Education*, 34, 5-14.

Jordan unpacks the commonly-heard metaphor of ‘scaffolding’ in this article and shows how the metaphor of ‘co-construction’ is more responsive to empowering children’s participation and perspectives in their learning and teaching experiences.

- Are you able to clearly identify the differences between these two (theoretical) metaphors? Can you provide a recent example of each? (Are there examples in the fieldnotes?) Might there be occasions when interactions move fluidly between the two approaches?

Unlike my article that unpacks one interaction, this article highlights the importance of recognising and continuing dialogue across time and space.

- Can you identify recent occasions of interactions with a child or children that you could write up similarly? (Are there examples in the fieldnotes?)

Walsh, J. A., & Sattes, B. D. (2005). *Quality questioning: Research-based practice to engage every learner*. Thousand Oaks, Calif: Corwin Press.

Notes attached as digest of book.

- Identify an occasion in the fieldnotes where you asked questions of children. (Vicky and Angela – there may not be something suitable due to the duties you undertake on a Friday – perhaps you could collect data for each other one day for the purposes of this exercise?) Use this as a basis for examining your practice alongside the notes provided from this book. What does this make you think about? What might you try out or do differently?

Optional recommended readings – see if you can guess which ones I selected specifically to meet **your** interests ☺

If possible, please come prepared to present the key points and implications for your practice of one article.

- Campbell, R. (2001). Learning from interactive story readings. *Early Years, 21*(2), 97-105.
- Fields, M. V., & DeGayner, B. (2000). Read my story. *Childhood Education, 76*(3), 130-135.
- Hansen, C. C. (2004). Teacher talk: Promoting literacy development through response to story. *Journal of Research in Childhood Education, 19*(2), 115-129.
- Jurd, E. (2004). Are the children thinking? *Primary Science Review, 82*, 12-14.
- Macro, C., & McFall, D. (2004). Questions and questioning: Working with young children. *Primary Science Review, 83*, 4-6.
- Macrory, G. (2001). Language development: What do early years practitioners need to know? *Early Years, 21*(1), 33-40.

Follow-up actions:

- What conversational cues might you be more alert for? What might you ask children more or more directly about?
- What other changes/improvements might you trial? E.g., mat time positioning, types of questions, use of wait time
- What kind of data would you collect to know if you were making a difference?

SESSION THREE

Assessment and pedagogical documentation

(Your wish list from 5/7/05)

- What are the purposes of assessment?
- What are the purposes of documentation?
- What makes documentation “pedagogical”?
- What kinds of evidence meet these purposes?
- Multiple types, sufficiency, quality of documentation
- Involving parents/families "educating parents on what children learn at kindergarten", "involving parents in planning"

To this I'd like to add what you see as responsibilities to “part-time attenders” (in both settings).

The approach that you are both using is based on the narrative approach of learning stories (Carr, 2001). You both note that these focus on dispositions, but that is not always highlighted in your documentation, so I hope that the readings for this session help you with your understanding and application of a “dispositions’ focus and the complexity of early childhood assessment from a sociocultural perspective.

Readings:

Carr, M. (1997). Persistence when it's difficult: A disposition to learn for early childhood. *Early Childhood Folio, 3*, 9-12.

In this article, Carr provides a definition of disposition, why she considers these important outcomes in education, and that these should link to the strands of *Te Whāriki*. An example, using the learning story framework developed by the Educational Leadership Project, is included that is taken from my 2003 article in *Early Childhood Folio 7*. Carr recommends focusing on only a few dispositions at a

time. Nowhere does she suggest that the five linked with learning stories are the only ones that should be focused on, hence my point in the 2003 article that this learning story can be used to extend the child's dispositions of 'being a scientist' and 'thinking scientifically'.

- Could you describe a dispositional approach to learning to a parent confidently?

Claxton, G., & Carr, M. (2004). A framework for teaching learning: The dynamics of disposition. *Early Years*, 24(1), 87-97.

This article provides further information about dispositions and makes links to how these are catered for in learning environments.

- How are children's interests a vehicle for the learning stories that you write?
- Considering your documentation, how well are you recording children's dispositions for learning?
- Focusing specifically on the topic of this research project, how well do you foster children's disposition to inquire in your setting? What evidence do the fieldnotes contain of occasions when this occurred? Are there occasions when it was not? If so, what were the constraints?

Te One, S. (2002). The fence or exploring the challenges of sociocultural assessment. *Early Childhood Folio*, 6, 22-26.

I think that if we are acknowledging the social nature of learning that we need to move away from the developmental theory and DOPs-inspired 'individual child' approach and more to group assessment (that can still be included in individual portfolios). Does Sarah Te One's reading provide thinking about authentic ways to do this? I think so!

(Actual session got to this point. Teachers invited to continue discussion at own team meetings.)

(From here - keyword – *smorgasbord*. Choose one or more of interest to **you**. Come prepared to present the key points you noted.)

Carr, M. (2004). *Assessment in early childhood: Keeping it complex, keeping it connected, keeping it credible*. Wellington: Te Tari Puna Ora o Aotearoa/New Zealand Childcare Association.

This is a highly readable collection of conference addresses that provide links between theory and practice. You might like to read each separately and choose some key points to discuss as a team. Bring your thoughts to our meeting.

Cullen, J. (2001). *Assessment dilemmas in a sociocultural curriculum*. Keynote address to TRCC course on Assessment in Early Childhood, Wellington, September 24.

Hatherly, A., & Sands, L. (2002). So what is different about learning stories? *The First Years: Nga Tau Tuatahi/New Zealand Journal of Infant and Toddler Education*, 4(1), 8-12.

Loveridge, J. (2004). Young children's learning in early education settings and at home: Mothers' understandings. *Early Childhood Folio*, 8, 2-8.

Ministry of Education. (2004). *Kei tua o te pai: Assessment for learning*. Wellington: Learning Media.

Podmore, V., & May, H. (2001). The “child’s questions”: Programme evaluation with *Te Whāriki* using “Teaching Stories”. *Early Childhood Folio*, 5, 6-9.

Smith, A. (2000). Reflective portfolios: Preschool possibilities. *Childhood Education*, 76(4), 204-208.

Follow-up actions:

- How might you involve children directly in assessment and documentation?
- How might you increase parent/family involvement in assessment, planning and evaluation?
- What other changes/improvements might you trial?
- What kind of data would you collect to know if you were making a difference?

SESSION FOUR

Planning (and projects)

Focus questions for session:

- How do we determine whose and which interests will be followed up in spontaneous and planned-ahead teaching and learning?
- Whose interests dominate planning? Why?
- How do we blend planning for individuals and groups?
- How do we keep projects going? What constraints and routines may impact on these?
- How do we involve parents/families/communities in planning?

Please bring your “big picture” planning/documentation to this session to share and discuss.

Readings:

Hatherly, A. (2004). Planning stories. *Early Education*, 36, 7-13.

Can we, as a group, devise our own planning model? Come with your thoughts and a draft.

Hill, D. (2001). Passion, power and planning in the early childhood centre. *The First Years: Nga Tau Tuatahi/New Zealand Journal of Infant and Toddler Education*, 3(1), 10-13.

This article highlights that the boundaries between ‘planned’ and ‘spontaneous’ curriculum in early childhood become blurred and overlapping, with each having a vital role to play, rather than the former perhaps being viewed as superior to the latter. To provide a curriculum based on children’s interests may require teachers to relinquish control of curriculum direction and empower children to lead curriculum. How well do you think you empower children to do this?

Both settings are keen on emergent curriculum and project work. Here’s some baseline material about these.

Helm, J. J., & Beneke, S. (2003). *The power of projects: Meeting contemporary challenges in early childhood classrooms – strategies and solutions*. New York & London: Teachers College Press & NAEYC. (p. 12)

- Helm, J. H., & Katz, L. (2001). *Young investigators: The project approach in the early years*. New York: Teachers College Press & NAEYC. (pp. 12-16)
- Jones, E., & Nimmo, J. (1994). *Emergent curriculum*. Washington, DC: NAEYC. (p. 33 & 127)
- Jordan, B. (1999). Dialogues and projects: Extending young children's thinking. *Early Childhood Folio*, 4, 3-7.

Optional readings:

- Floerchinger, J. (2005). The lunch project. *Early Childhood Research & Practice*, 7(1). Retrieved June 14, 2005 from <http://www.ecrp.uiuc.edu/v7n1/floerchinger.html>
- Nacif, V. (2005). The food and restaurant project. *Early Childhood Research & Practice*, 7(1). Retrieved June 14, 2005 from <http://www.ecrp.uiuc.edu/v7n1/nacif.html>

Shared project planning: Based on the fieldnotes data, there are several possibilities of topics for shared planning. Two I suggest are:

- popular culture
- how our bodies work (incorporating health, physical exercise and nutrition)

Let me know if you have other ideas and if we have time, we will work on these, perhaps using a web planning format, at our session.

SESSION FIVE

Links between research, practice and professional development

If early childhood teaching is to be seen as a profession, we must be able to articulate a body of professional knowledge supported by rigorous research evidence that forms the basis of educational decision-making. Internationally, early childhood is a relatively recent discipline and we have commonly relied on research from the United Kingdom or North America to guide decision-making. A prominent example of this is developmental learning theory that led to curriculum based on “developmentally appropriate practice”. New Zealand is steadily building its own research evidence about early childhood education, but the first iteration of the Best Evidence Synthesis (Farquhar, 2003) is a relatively slim volume, indicative of the amount and quality of research so far.

Reading 1:

Farquhar, S.-E. (2003). *Quality teaching early foundations: Best evidence synthesis*. Wellington: Ministry of Education. pp. 1-4. (NB The full report is downloadable from the www.minedu.govt.nz website)

- Sarah Farquhar’s (2003) recent synthesis of NZ research in early childhood education brought together examples of evidence of teaching and learning practices that make a positive difference to children’s learning. Farquhar notes that there is much professional opinion about best practice, but that this is not yet backed up by evidence. Farquhar also notes that there is a little research evidence of an acceptable research standard (she lists the criteria for this on p. 17) that discusses what teachers do that makes a difference to outcomes for children. She identifies seven pedagogical principles that underpin quality learning and teaching. The executive summary of these is

contained in the first reading. In your individual interviews, one of the questions was “What personal and professional qualities and knowledge does an early childhood teacher need?” Many of you could describe the qualities, but were less forthcoming about the professional knowledge base. Drawing on Farquhar’s synthesis and your experience in this project, let’s try to now collectively articulate the knowledge base an early childhood teacher needs.

Reading 2:

Nuttall, J. & Edwards, S. (2004). Theory, context, and practice: Exploring the curriculum decision-making of early childhood teachers. *Early Childhood Folio*, 8, 14-18.

- In what ways do you currently use theory and/or research to inform or analyse practice? How do you currently access research findings? In what ways (if any) would you like the relationship between research and practice to be closer and more mutual? How can the academic community support teachers to know about, understand and consider research in their everyday decision-making as part of their teaching practice and professional development?
- Thinking about the ideas raised in this paper and responses to your interviews, sources of teacher knowledge that you draw on daily include beliefs, experience, influential people who are often role models, teacher education, professional development opportunities, other study, research, reading and networking. Have I missed any?
- What would you say are the key things that make you decide which children’s interests will be picked up on in either (future) planned or spontaneous curriculum? What sort of evidence do you think I might look for when I analyse all the data from this project? (You may find it useful to revisit Diti Hill’s article from session 4)
- Revisiting ideas from your individual and group interviews, how would you describe the relationship between children’s interests and teachers’ interests in your programme? What other things influence your regular planning?
- What changes have you made in your individual and group practice during this project? What can be attributed to participation in this project? What other changes would you like to have made or will yet work on? What constraints have there been that affect the ability and pace of change?
- How can you see and chart the journey and shifts in practice for individual teachers and the centre that come from experience and professional development? (In other words, what evidence do you have of your changes over the last year?)
- How will you keep up individual and group inquiry? Outside perspectives create springboards to new learning and development – where are the sources of these?

(Actual session got to this point. Teachers invited to continue discussion at own team meetings.)

There are several potential topics of further discussion at our last session. I have chosen three. Please choose at least one topic and reading/s from the following to talk about at our meeting:

TEACHER DEVELOPMENT PORTFOLIOS

Keeping individual portfolios for teachers (alongside the ones you have for children and your overall group/centre planning/documentation) is something that seems to be viewed as a low priority across all sectors unless one is undertaking teacher registration or perhaps some other form of evaluation. I would suggest that the kindergarten teacher professional standards are likely to permeate the sector more widely to determine funding and salaries and that portfolios of evidence would support this and/or any form of professional appraisal. Read the following two articles.

Gelfer, J. I., Xu, Y., & Perkins, P. G. (2004). Developing portfolios to evaluate teacher performance in early childhood education. *Early Childhood Education* 32(2), 127-132.

Goodfellow, J. (2004). Documenting professional practice through the use of a professional portfolio. *Early Years*, 24(1), 63-74.

- How you might keep a portfolio that records ways in which you build a curriculum built on children's interests?
- What other evidence of shifts in your own practice would be valuable to keep track of?

ENGAGING WITH THEORY

For examples of curriculum theories that I have brought up with some of you as individuals during the project, read:

Joseph, P. B. (2000). Conceptualising curriculum. In P. B. Joseph, S. L. Bravmann, M. A. Windschitl, E. R. Mikel, & S. Green (Eds.), *Cultures of curriculum* (pp.1-14). New Jersey: Lawrence Erlbaum.

- Which of these conceptions of curriculum spark ideas for you? Do any particularly make you think about how children's interests might be noticed, not noticed (unintentionally), followed-up or not?
- What ideas do these theories give you for ways to inquire into your own practice?
- What definitions of curriculum such as *Te Whāriki's* or your own personal theories/definitions are extended and/or challenged by these ideas?

A current theoretical stance is that of "post-structuralism". (Explanations of this are provided in the readings.) Post-structuralism as a stance could be considered appropriate for the focus on this project on inquiry and questioning. A post-structural perspective enables us to look more deeply at our practice, especially taken-for-granted practices, by employing ideas from a wide range of disciplines. Read the following if you are interested in following this up for this session:

Jones, L. (2001). Trying to break bad habits in practice by engaging with poststructuralist theories. *Early Years*, 21(1), 25-32.

MacNaughton, G. (1995). A post-structuralist analysis of learning in early childhood settings. In M. Fleer (Ed.), *DAPCentrism: Challenging developmentally appropriate practice* (pp. 35-54). Watson, ACT: AECA.

- What messages do these examples have for your practice? And particularly for your stance as a teacher reflecting on her practice?

Appendix 13 Summary tables: Descriptive analysis answering the four research sub-questions (shared with teachers)

Draft title- “Inquiring minds, meaningful responses: Early childhood communities of inquiry”

The early childhood curriculum in Aotearoa/New Zealand, *Te Whāriki*, (Ministry of Education, 1996) acknowledges the importance of children's interests as one source of curriculum planning and recognises that learning takes place through relationships with people, places and things. More recently, Carr (2001a) has linked children's interests to the disposition to inquire within the strand of well-being. Further, the strand of belonging affirms "connecting links with the family and wider world" (Ministry of Education, 1996, p. 54).

The purposes of the present study were to:

- increase knowledge about, bring coherence to and provide a framework for understanding of children's interests and inquiries
- extend current knowledge of and articulate a framework/model for early childhood curriculum and pedagogy from a sociocultural perspective
- increase understanding about teachers' professional knowledge that supports children's authentic, meaningful learning during co-constructed inquiry
- explore the role of the critical friend/mentor in research partnerships that blur the boundaries between research, practice and professional development

Research questions

The overarching question guiding the present study, including its research design, was: How might teachers, children and a researcher co-construct a community of inquiry in early childhood education?

This was investigated through attention to four questions:

1. In what ways do teachers recognise and determine children's interests in relation to the range of children's prior experiences and funds of knowledge?
2. How do teachers choose whose and which interests will be engaged with and extended in building curriculum during both planned and spontaneous teaching and learning interactions?
3. What professional/pedagogical knowledge and dispositions do teachers need to assess and respond meaningfully to children's interests and inquiry and generate teaching and learning programmes?
4. How might a researcher utilise the role of the critical friend/mentor in research partnerships to blur the boundaries between research, practice and professional development?

Level one descriptive analysis related to research questions:

RESEARCH QUESTION 1:

In what ways do teachers recognise children's interests in relation to the range of children's prior experiences and funds of knowledge?

Ways children's interests are recognised:

- observation of the choices children make in the learning environment teachers create
- through questions, investigations and dialogue with children initiated by teachers and/or children
- allowing children to bring information and/or items from home and use these as "news reports"
- observing children experiencing difficulty with something and wanting to persist with the equipment or activity
- the use of "Me" sheets that parents completed about children, "parent voice" forms in portfolios or parent contributions to "baby diaries"
- through conversations with parents and children about what they did on the weekends or holidays
- through written assessments of significant learning moments or interests
- inviting children's participation in something and noting their response
- through their socio-dramatic, pretend play (and dialogue during this)
- through "systems" to ensure all children are noticed

RESEARCH QUESTION 2:

How do teachers choose whose and which interests will be engaged with and extended in building curriculum during both planned and spontaneous teaching and learning interactions?

Whose and what kinds of interests are engaged with?

Whose and what interests?

- teacher interests and knowledge
- children's interests from home (books, toys, photos)
- "teachable moment" interests
- children's interests determined by availability and use of the play/learning environment
- community and cultural interests

How are interests used in building and extending curriculum?

- to develop ideas, extend play and introduce new experiences
- to effect planned curriculum beyond play-based experiences (e.g., mat times, excursions and projects)
- in celebrations and rituals
- to utilise funds of knowledge
- to plan and/or purchase new resources and equipment
- to let children set up the environment

- used to encourage perceived “gaps”, extend learning into other areas rather than extend or encourage interest per se, or to redirect children at a loose end
- to settle children or encourage appropriate behaviour

Whose interests are noticed?

- children who approach teachers
- children whom teachers have a special affinity to or relationship with
- children whose interests are noticed and continued by other children
- children whose interests coincide with teachers
- children who are nearly five and perceived of as in need of extending and/or challenging (*NB just TK*)

RESEARCH QUESTION 3:

What professional/pedagogical knowledge and dispositions do teachers need to assess and respond meaningfully to children's interests and inquiry and generate teaching and learning programmes?

Knowledge categories:

- knowledge of children and families
- willingness to develop relationships with children and parents
- when and how to document children’s learning meaningfully and authentically
- knowledge of curriculum and of assessment, planning and evaluation
- knowledge of what constitutes children’s authentic interests and inquiry
- knowledge of different pedagogical styles/techniques
- use of theory and/or research (apart from previous category)
- knowledge of creating an appropriate learning environment that stimulates and extends children’s learning
- knowledge and willingness to work as a team to enhance children’s learning
- personal and professional qualities
- disposition to reflect on own teaching abilities; listen to and act on feedback
- subject content knowledge relevant to children’s interests and inquiries
- knowledge of gender issues and awareness of self as teacher
- knowledge of popular culture

RESEARCH QUESTION 4:

How might a researcher utilise the role of the critical friend/mentor in research partnerships to blur the boundaries between research, practice and professional development?

Costa and Kallick (1993) define a critical friend as:

a trusted person who asks provocative questions, provides data to be examined through another lens, and offers critique of a person's work as a friend. A critical friend takes the time to fully understand the context of the work presented and the outcomes that the person or group is working toward. The friend is an advocate for the success of that work (p. 49).

- provide data (fieldnotes) for teachers to reflect on how much occurs during a period of time and how their practice is viewed
- use data as evidence to query/confront/shift practices
- provide information about research-based practices to trial
- provide readings from literature and encourage discussion through focus questions to support teacher knowledge of current research and theory

My theoretical analysis seeks to apply and extend the notion of “funds of knowledge”:

The personal qualities of children’s knowledge are based on the unique family and community experiences that contribute to their foundational knowledge, encapsulated in the concept of “funds of knowledge” (Moll, 2000; Moll, Amanti, Neff, & Gonzalez, 1992). Moll et al., define funds of knowledge as the bodies of knowledge that underlie household functioning, development and wellbeing. Examples include economics, such as budgeting, accounting and loans; repair, such as household appliances, fences and cars; and arts, such as music, painting and sculpture (Moll, 2000). This concept has been further interpreted recently to include knowledge children learn through their parents’ occupations and interests (Carr, 2001a). In the paper of mine (Hedges, 2004) that you read in phase two, Katie had many experiences of music and literacy provided by her parents. It was therefore unsurprising that language, literacy and music played important roles in Katie's expression of new understandings in other knowledge domains. Furthermore, awareness of children's funds of knowledge may also lead to consideration of the social and cultural capital or affordances available in children's families that impact on their opportunities for learning. Again, the example of Katie demonstrates this. Katie had had access to dancing and music classes that have contributed to her knowledge and experience.

Moll et al. (1992) propose that teachers build on knowledge and practice occurring in children’s homes. Through understanding the child’s prior knowledge and interests and the child’s home background and funds of knowledge, teachers and children can construct and extend children’s knowledge. The concept of funds of knowledge provides a positive and credit-based way for teachers to collaborate with parents in children's learning. It is also responsive to the clear message that you all provided throughout the study that knowledge of children and families is the most vital knowledge category in your understanding of children’s interests and provision of a curriculum built on these. You picked up on the notion of funds of knowledge at that session and alongside your emphasis on knowledge of and relationships with children and families, I think this is the most appropriate theoretical analysis for the study.

I have therefore re-analysed the data to develop categories of funds of knowledge. The first few come from the existing literature but the later ones related to children are from this study. I have also extended the notion to

incorporate teacher knowledge. These are the categories I have developed at present.

CATEGORIES OF FUNDS OF KNOWLEDGE

Children's funds of knowledge

- parents' participation in household, domestic tasks
- parents' occupations
- parents' interests and talents
- parents' language
- parents' values and beliefs (including about education)
- parents' methods of guiding behaviours
- grandparents' occupations, leisure activities and interests
- siblings' interests and activities
- siblings' language and behaviours
- teachers' language, activities, interests, family experiences, behaviour guidance etc
- peers' and cousins' interests and activities
- popular culture as a cultural artefact
- parents' siblings' and friends' interests and occupations
- cultural events linked to the centre such as trips
- social and cultural affordances such as dancing classes, swimming pools, family outings, holidays or trips
- other social and cultural experiences (e.g., going to doctor/dentist)

Teachers' funds of knowledge

(can also be viewed as evidence types that influenced your knowledge and impacted on your decision-making)

- teacher education
- professional development, including programmes, workshops and conferences
- other study
- research participation
- professional and academic reading
- networking
- influential role models
- experience of being with and having relationships with children (own and centre)
- experience of teaching (and similar roles) in other parts of the early childhood sector
- personal and family experiences

So what do you think of these analyses? I look forward to getting together to hear what your thoughts are 😊

*Appendix 14 Summary table of children's working theories and spirals of knowing
(extended version)*

**EXAMPLES OF CHILDREN'S WORKING THEORIES, SPIRALS OF
KNOWING AND IMPROVABLE OBJECTS**

<p><i>Working theories</i> ... working theories contain a combination of knowledge about the world, skills and strategies, attitudes, and expectations. ... (Ministry of Education, 1996, p. 44).</p>	<p>1. scientific properties of objects [Imogen] picks up another sponge and gets some bubbles from the rubber matting to clean the back of the bike again. She looks intently underneath at the sponge a few times. I ask her what she is looking at in she tells me "the bubbles. They go!" She repeats this again and then resumes cleaning and drying. (1K/150)</p> <p>2. human growth and development</p> <p><i>i) birth of a human baby</i> Immy "Your baby, your baby come out of mummy's tummy." [Name] shakes her head "My baby come out of mummy's bottom." Immy laughs (tone of disbelief) "Yeah out of her bottom" (1K/168-169))</p> <p><i>ii) adult responsibilities</i> Tom: "You have to be 16 to drive." I ask him when he will be 16. "When I'm an adult. When I'm a big school boy and then when I'm finished I'll be an adult." (TK/22)</p> <p><i>iii) lifelong friendships</i> Harry, Caitlin and Gina talk about their brothers and how they are all the same age, go to the same school (but one has a different teacher to the other two) and play sports together and that this is how they (C, G & H) got to become friends too. They tell me they are all going to the same school as well and will be friends there too. Gina "Even when we're big we'll still be friends." Caitlin "Even when we're adults." Gina "Even when we're dead." Caitlin "Well maybe not then." (TK/77)</p>	<p>1. Imogen is developing a working theory and expectations about the properties of sponges and bubbles through her repeated actions. These kinds of everyday understandings are beginning working theories towards a scientific body of knowledge.</p> <p>2. Children developed many minitheories about human growth and development. In the second and third examples, attempts at connecting them are made.</p> <ul style="list-style-type: none"> • Imogen has a working theory about where babies come from based on her experience (likely to have been supported by cultural explanations) that is not challenged by her peer's information as it is so discordant with her theory. • Tom has working theories about adult roles and responsibilities related to age, with consequent expectations. • Harry, Caitlin and Gina share a working theory about the importance of and expectations for lifelong friendships in human social functioning
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	<p>3. technology. Olivia gets on the phone "Hi, can we just have something? We have a office. We need to print something out. OK, thanks, 'bye" (hangs up). She puts paper against the phone to 'feed' it through and tells me it will come out the other side with colour on. ... Olivia picks up her writing "I want to print it out." Lucy "print it out on the computer." Olivia feeds it into the keyboard this time, presses a key, watches it, then pushes it through manually. (1K/131)</p> <p>4. medical issues <i>i) ear infections and hearing problems</i> Billie ... is also now holding her ear and saying it is sore. Ruth agrees to ring her mum. As Jack has continued to play with the cogs, he has clearly heard and understood the conversation. He says to me "They need to take Billie to the doctor. There's a beeping thing that goes in your ear. It beeps in people's ears." (What does the beep mean? What does it tell you?) He thinks and then says "my ears are fixed!" (It's called a tympanometer or 'tymp' for short and tells the doctor if you might have trouble hearing things because of fluid in your ear.) (1K/87-88)</p> <p><i>ii) treating injuries</i> Amelia joins us and ... has a tiger with her and tells Immy it has a sore tail. I fold some paper and help them sellotape it around the tiger's tail. Immy "sore ear" and tears tiny pieces of paper to sellotape on the tiger's ear. She then says her doll has a sore tummy and starts to sellotape paper onto that too. ... She continues covering the doll with paper and sellotape telling me "She be all better soon." Billie comes over "I do some?" Immy nods "Good girl Bill." Billie starts to help her with paper and sellotape. Amelia put sellotape on her own finger and shows me "sore finger. I show Mummy when I get home." Billie is ripping off very long pieces of sellotape. Immy "Don't do too much OK Bill?" Amelia to Immy "We the doctors, eh?" (1K/179)</p>	<p>3. Olivia has developed a number of working theories about how technology (office equipment) works. Her experience with the hardware of office equipment is complemented by her "magical" thinking about software to support these.</p> <p>4. Medical problems and treatments were a common source of interest. Children developed their own working theories about these in the absence of more complex information based on the expectation that going to a doctor was for the purpose of solving a problem and becoming well. It was also likely that such working theories gave children control over a difficult situation.</p> <ul style="list-style-type: none"> • Jack has developed a working theory about ear infections, diagnosis and treatment (including the purpose of a tympanometer based on his experience that he transfers, empathising with Billie's sore ear. • Amelia, Imogen and Billie have a working theory that plasters (symbolised through sellotape) have magical properties and can heal all injuries.
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<p><i>Spirals of knowing</i></p> <ul style="list-style-type: none"> • experience • information • understanding through a process of knowledge building • action <p>(Wells, 1999)</p>	<p>1. ... a fire truck is out waiting to be shown to the children. [The father] facilitates the observation and discussion about the features of the fire engine. He does a superb job, talking at the children's level, involving them and keeping the pace going. ... The children ask questions and are attentive as he shows them the tools and other features. ... He then puts on his uniform for them and shows them particular features, such as the breathing apparatus. ... He attaches the hose to a hydrant and allows each child to take a turn. ... The group are then offered the opportunity to climb into the fire truck, have a look at the equipment inside and climb down the other side. We then go inside the fire station to be shown the lights, bells and doors. ... As we are arriving [back] at kindergarten, Greta tells me "that was fun ". I ask her what she will tell her Mum tonight about the trip. "I will tell her lots because I have lots of information because I tried things". (TK/31)</p> <p>2. Jack's mother - As a family we've got the boating interest. We have a yacht and we went away on that a fair bit over summer and so Jack's very interested in the outboard motor on that. Helen - Did it need a new propeller recently? Jack's mother - Yeah we did have to take them in to be fixed actually and the thing that's happened most recently with our yacht is it's come out of the water and so that's generated a whole lot of fun. He watched it coming out on the travel lift and then the straddle lift, transported and propped up, put on a truck, put Rawhiti on a truck didn't we Jack and took it to [Name's] place. Helen - You told me about that Jack, that it had come out of the water. (CFI/121-123)</p>	<p>1. Children's experiences of observing fire engines and fire fighters are supported by information and hands-on experience (participation) to build knowledge collaboratively about fire fighting tasks and equipment.</p> <p>2. Jack has developed knowledge about the parts of boats and boat maintenance through intent participation with his parents in a family interest, renovating a yacht. Through his involvement he has gradually learned more in a spiral fashion.</p>
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	<p>3. Immy notices rain water that has collected on the [table outside]. Immy puts her doll into the water "I wash baby's hair." ... [Safiya and Billie join her.] Immy describes her actions "Wash your face bubba, wash your tummy, wash your bum bubba, wash your bum, and your legs and your arms and your face." The girls' clothes are getting wet so Immy takes her sweat shirt off. She then tells the others "I take barks off" and begins to pick up and remove the pieces of bark in the water. ... Billie joins in "I get some" and picks up pieces of bark to put in the water. Immy "You putting poos in bath." The girls all giggle and pick up more bark to put in it. Billie then runs off vocalising loudly and laughing. Immy calls "Wash your baby Billie! Wash your baby!" Billie returns and the three of them continue to wash their babies with the water being swished everywhere. Danyela is watching intently. . . . They pick up their dolls. Immy "My baby's dirty, I need to bath it." She heads off up the ramp and the others follow her. As they pass Barbara, she asks where they are going. They don't reply as they are on a mission so I explain the mission's purpose. Barbara offers to get them a baby bath with warm water and flannel. She gets two dolls' baths from the family corner and they talk about getting warm water and soap. ... Barbara sets Danyela and Immy up outside on a wooden table in a sheltered sunny spot near the sandpit. They set to, concentrating carefully on bathing the dolls with the flannels and soapy water. Immy tells me "Safiya got a big big big bath." Danyela "it will have to go down there" looking at the ground beside them. Safiya arrives with Barbara. Barbara "You got the spa pool Saffy." Danyela "You got spa pool." Immy "I got big big bath." Barbara offers them baby shampoo that she puts on the dolls' heads. She encourages them to rub it in with their fingers but they continue to use the flannels. ... Barbara praises the girls for their careful washing of their babies.</p> <p>(1K/165-166)</p>	<p>3. As these toddlers do not have younger siblings themselves, their experience of caring for babies has come from both observing their care in their extended families and at the centre, coupled with participation in such socio-dramatic play with older peers (including siblings). Here these two year olds are experts. Their understandings are extended by information and experience from adults. These are then represented in increasingly sophisticated representational play.</p>
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	<p>4. Immy "I make you coffee. You have coffee?" (Yes please.) Immy 'makes' coffee with lots of sand stirring and coffee machine/milk frothing noises. (1K/143)</p>	<p>4. socialising (preparation of food and drink and appropriate social interactions). Imogen's interest in socialising is a fund of knowledge from her family experiences. Her recent experience of going to a café with her mother is represented by changes to her usual pattern of making tea or coffee in the sandpit to include the café experience of machines that undertake this task.</p>
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Appendix 15 Analysis of children's interests (modified from Cremin and Slatter, 2004). Example: Jack

Matrix of individual children's interests

Child: Jack

<p>Child self-reported/shown to me of home interests (data set 3)</p>	<p>120 – mechanics of tape recorder for interview (investigates batteries, switches, listens to playback) 120 – books (Curious George & The very hungry caterpillar) 121 – Thomas the tank engine stories 123 – ear muffs to reduce noise, power tools with father 125 – bikes 128 – music and dancing 129 – special friend E. 130 – animals at grandparents 133 – swimming 134-135 – zoo, animals and “zoo doo” (animal excrement sold as fertiliser) 135 – DVDs - Thomas the tank engine</p>
<p>Reported and/or supported by parent description of home interest (data set 3)</p>	<p>120 – listening to stories 121 – lots of books (current favourites noted above by Jack) 121 – train set 121 – helping to cook and prepare meals 122 – tools (like father's in workshop) 123 – family yacht, boat, outdoor motor 124 – “He's definitely got an interest in things and how they work” 124 – quad motorbikes at grandparents 127 – musical instruments 129 – swimming 129 – special friend E. and her family 130 – animals at grandparents 133 – swimming 134 – going to zoo 135 – DVDs – Toy Story, Finding Nemo 136 – parks, playground, beach 137 – book & DVD of The very hungry caterpillar</p>
<p>Child self-reported/shown to me of centre interests (data set 3)</p>	<p>123 – carpentry tools (referring to new experiences at TK) 128 – train set (stimulated by photo) 128 – special friend E. (looking for her in photos, couldn't understand why I didn't know who she was) 130 – playing “Mums and Dads” (1K)</p>
<p>Parent report of interests at centre (data set 3)</p>	<p>123 – carpentry (TK) 129 – friendship with E. and D. (both girls, the three families socialise regularly) 130 - playing “Mums and Dads” (1K)</p>
<p>Interests noted by me in fieldnotes and photographic evidence (data sets 4, 5 & 7 & 8)</p>	<p><i>fieldnotes</i> 7 – items in nature area, “moons and stars and planes and boats”, boat at own house 12 – Shrek book and Toy Story book looked at with other children 13 – feeding fish with Angela 14 – action songs with dancing and music 17 – “Blue Bear” (own teddy bear from home)</p>

	<p>24 – loading sand onto a truck while talking about boats and trip to beach house 28 – reading a story with Barbara 30 – swing 32 – talking non-stop to any adult he finds 34 – trains/train set 34 – Nemo 41-43 – playing with D. and Finn 45 – talking about previous trip to Kelly Tarlton’s 46 – pouring sand repeatedly, watching intently 60 – The very hungry caterpillar story 62 – music and actions 64 – barrel swing (pretends is a cargo hold) 65 – fruit and vegetables growing in garden 65 – road signs; barrel swing 81 – I mention cogs and his eyes light up (I made sure he got to play with them the next week) 86 – Isabel’s praying mantis, family boat, child’s birthday morning tea (puts chocolate cake in his milk to make “chocolate milk”, drinks with delight) 87 – vegetables centre cook is preparing for lunch 87-88 the cogs and motor with Ruth (investigates batteries as well) 88 – Billie going to the doctor, tympanometer 89 – went fishing 100 – plastic animals 101 – The very hungry caterpillar story</p> <p><i>Photographs</i> 1K 18/3 – opening and investigating new train set 01/4 - in the tree “driving a car” 8/4 – trip to Kelly Tarlton’s and investigating bar in footpath afterwards 29/4 – enjoying Pukeko Stomp, wanting to see The very hungry caterpillar book, next book at mat time also up front 6/5 – in barrel swing with Imogen, Billie and Marcella 3/6 – dancing 3/6 – cogs with Ruth (x9) TK 26/10 – dye painting with E., investigating milk frother, barrel swing</p>
<p>Interests documented in portfolio and/or curriculum documentation (data set 8)</p>	<p><i>Portfolio 1K</i> 08/04 – cutting and drawing, knows names of colours of crayons, dispositions of patience and perseverance noted 11/04 – raindrop art (shared group documentation, not specific to Jack) 03/05 – trip to Fairy Forest, trees etc. Group documentation with individual added, Jack’s imagination noted 07/05 – Learning story: “Dolly’s arm” – while playing with E. and D. doll’s arm fell off, most concerned, played doctor’s with Barbara to fix it, learning story notes how sensitive and serious he is</p> <p><i>Portfolio TK</i> 08/08 – painting of his family 08/08 – “Me” sheet completed by parents reports home interests as</p>

	<p>his “workbench in Daddy’s workshop, Thomas train set, reading stories, Mac the cat, favourite books: Gumdrop at sea and Curious George</p> <p>09/09 – drawing of a boat with rudder and tiller Theresia: “Jack you do know a lot about boats. I will have to find out more information about this and get to know you better.”</p> <p>09/09 – climbing the cargo net as practice in risk taking and perseverance</p> <p>09/09 – dancing at mat time (group photos, paragraph on Jack)</p> <p>10/10 – Learning story: engrossed in reading book about boat, told Louise all about the picture and own boat, shared own knowledge. Louise notes to parents that she would like to hear more about home experiences.</p> <p>11/10 – story from home about family boat</p>
<p>Interests recognised by teachers (data sets 1, 4/5, 6)</p>	<p><i>IK</i></p> <p>5 – Angela: parts of a boat, helicopter, very verbal</p> <p>10 – Barbara – not interested in water play but will have stockholding portfolio by the time he is 15</p> <p><i>TK</i></p> <p>138 – Theresia – sea creature painting</p> <p>141 – Theresia – spiders</p>
<p>Other/Misc (data sets 4 & 5)</p>	<p><i>IK</i></p> <p>83 – Jack looks at his portfolio and I note there is little in it</p> <p>86 – Ruth had bought junior engineer for Jack but he’d not had the opportunity to play with it because of attendance/programme/circumstances. Similar with cogs, but I intervene and he has a 1:1 session with Ruth.</p> <p>94 – decision re change to nanny and TK after new baby’s arrival</p> <p>129 – Barbara mentioned dolly’s arm incident she is documenting</p> <p>145 – Jack’s name at top of list on filing cabinet for portfolio attention</p> <p>217 – E. tells Barbara and me that Jack choked on a lolly “in his oesophagus”. Barbara “That’s a real Jack [surname] word!”</p> <p><i>TK</i></p> <p>131 – Christine comments Jack is quiet and timid as settling in.</p> <p>170 – Christine comments Jack quite different, more outgoing, now E. also attending, but also follows her rather than leading and initiating.</p>