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The role of peers in children's learning

A thesis presented in partial fulfilment of the requirements for the degree of Master of Education (Early Years) at Massey University, Palmerston North, New Zealand.

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Abstract

This study investigated the nature of peer learning within two early childhood centres in order to explore how children worked together collaboratively and as peer tutors. The research was framed within a post-positivist paradigm and a qualitative case study approach was adopted. The data collection methods included a series of observations of children's play, informal conversations with the children and semi structured interviews with two teachers from each early childhood centre. A research journal was kept in order to maintain critical reflection during the data collection phase. The case studies were analysed using constant comparative analysis to identify the emerging themes from within the data. The use of Rogoff's (1998) planes provided a further tool for analysis of peer learning.

The study found that young children are capable peer tutors who use a variety of strategies to work together successfully with their peers. The evidence gathered, highlighted the need for teachers to create empowering environments where children can direct their learning alongside their peers. An important finding was that routines impacted negatively on opportunities for sustained collaborative play. The study revealed the need for teachers to adopt a responsive teaching presence, interpreting their role in response to children's efforts to engage in collaborative endeavour. It is argued that teachers need to position children as experts who are capable of sharing their expertise with their peers to advance their understanding. This requires teachers to provide meaningful opportunities for children to take on teaching roles with their peers.

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Chapter one

Introduction

Current accounts of how children learn and develop recognise the importance of peer interactions in this process. Early writing by Rogoff (1984) and Wertsch (1995) proposed a view of cognition that is socially defined and interpreted; a view which is now widely accepted. Children are viewed as active participants in the learning process, closely connected to other adults and children. Early childhood settings provide young children with numerous opportunities to closely interact with their peers in a play based environment. Play takes a central role and is the vehicle by which children collectively explore and question their ideas and thinking. Wood (2004, p. 19) states that one of the “fundamental principles in early childhood pedagogy is the importance of play to children’s learning and development”. This statement affirms the place of play as central to early childhood curriculum. During play, children develop their thinking as they participate in a range of learning experiences with their peers. It is through these experiences that children actively challenge and extend each other’s thinking.

This thesis examined peer learning as it unfolded in two early childhood centres, focusing on peer tutoring and peer collaboration as related processes which are central to children’s learning. The central question which this study explored was how do peer tutoring and peer collaboration take place in a play based environment? Case study methodology was adopted as it allowed the complex nature of peer interactions to be studied. The research explored three key aspects of peer learning which are as follows:

1. The strategies which children adopt when teaching their peers and working collaboratively were investigated. There is a body of research (e.g. Barnard, 2002; Belsham, 2000; Brown, 2006; Grant, Medcalf & Glynn, 2003) which examines the strategies which children in compulsory classroom settings use to tutor their peers, however there has been little research conducted with younger children in early childhood settings.
2. This study explored how teachers promoted and supported opportunities for children to tutor their peers and work collaboratively. Within a sociocultural framework, it is advocated that teachers adopt an active role in children's learning (Anning, Cullen & Flear, 2004).
3. Lastly, the role that the learning environment plays in supporting collaborative endeavour was examined. The environment plays a significant role in supporting peer learning (Claxton & Carr, 2004).

Rationale for the study

A review of the literature concerning young children's learning identifies an increasing recognition of learning and thinking as a social act rather than an individual activity (Daniels, 2005; Rogoff, 1990; Wells, 1999; Wertsch, 2002). Recent research about how children learn provides support for both peer collaboration and peer tutoring as valuable approaches to learning (Angelova, Gunawardena & Volk, 2006; Chung & Walsh, 2006; Fawcett & Garton, 2005; Haworth, Cullen, Simmons, Schimanski, McGrava & Woodhead, 2006). A recent small scale study of primary age children working together in a buddy class, completed for a post graduate paper, provided evidence of children using a variety of peer tutoring strategies within a new entrant classroom context (Smith, 2008).

The results from this small project prompted an investigation into peer learning in early childhood settings.

Key reviews of research in this area (Puchner, 2003; Rohrbeck, Ginsburg-Block, Fantuzzo & Miller, 2003; Wilkinson, Hattie, Parr & Townsend, 2000) identify the need for further research which explores teachers' knowledge about peer learning. In a literature review on the influence of peer effects on learning outcomes for the Ministry of Education, Wilkinson et al. (2000, p. 119) identify the need for research "on the relationship between the peer learning environment and the associated learning mechanisms and processes". There have also been calls for further research which examines the characteristics of assistance provided by preschool age children in peer tutoring (Johnson-Pyn & Nisbet, 2002; Katz, 1995). This study provides an opportunity to gain insight into peer tutoring and peer collaboration practices in an early childhood setting; a somewhat neglected focus as previously noted. The study has implications for teachers' practice, as it will identify factors which need to be in place if children are to learn effectively from their peers.

Aims and organisation of the thesis

The main aim of this research was to explore the nature of peer collaboration and peer tutoring within early childhood settings. Specifically, the study investigated how children work together collaboratively and act as peer tutors. This included an exploration of the children's awareness and understanding of their role as peer tutors. The study also aimed to explore the knowledge that teachers have of peer learning and to examine how this impacted on their practice. Finally, the study considered the environment in order to see what role it played in promoting opportunities for collaborative endeavour.

In chapter two the literature associated with peer learning is reviewed. Relevant aspects of two major theoretical explanations for peer learning are explored: cognitive constructivism; and social constructivism. The review then examines previous and current research, identifying a range of evidence about peer learning. The literature reviewed identifies the need for further enquiry into peer learning amongst young children.

Chapter three outlines the methodological approaches used in this study. The use of a post positivist paradigm is justified and the nature of the case study approach is explained. The key methods used to collect and analyse the data are described and the ethical steps which were taken in this research are presented. This chapter also introduces the participants and the settings.

Chapters four and five present the results from each early childhood centre. These are organised around the main themes which emerged from the data. The data presented in these chapters includes an analysis of the observations and conversations with the children, the teacher interviews and reflections from the research journal that was kept during the data collection phase.

Chapter six discusses the main themes generated in both case studies. The results are compared and contrasted with existing literature and similarities and differences are drawn between the two case studies.

Chapter seven provides a summary of answers to the research questions which framed the study. In addition, reflections on the methodology adopted for this study are presented, along with an examination of strengths and weaknesses. The chapter concludes by presenting implications for early childhood education in New Zealand and for further research.

The literature review which follows places this study within the theoretical framework which has been used to analyse and interpret the data that follows. It also critiques the methodologies which researchers have adopted to investigate this topic.

Chapter two

Literature review

Introduction

The review begins by establishing a theoretical framework which elucidates the role of peer learning according to contemporary research. Aspects of both cognitive and social constructivism are identified and discussed as they each contribute to the topic. The review then addresses key areas which previous research has consistently highlighted as being of importance within peer learning. A number of studies investigate the strategies which children adopt when working collaboratively and as peer tutors and these are presented and discussed. Less attention has been paid to the child's perspective of their role as peer tutors however there is some research which examines the conceptions young children have of learning and teaching and these studies are reviewed. The section that follows summarises studies which explore the role of the teacher in peer learning, including the nature of teachers' beliefs and the role of the curriculum in guiding teachers' practice. Finally, a number of studies emphasise the importance of the learning environment in supporting sustained, high quality collaborative interactions between children; these findings are considered. Concluding comments focus on the limitations of current theory and research, outlining implications for teachers and making connections with the study presented here. This chapter concludes by introducing the research questions which formed the framework for this study.

Key terms

The literature on peer learning uses the terms 'peer tutoring' and 'peer collaboration' interchangeably at times; at other times they distinguish between the two. Peer tutoring is connected to social constructivism, specifically within the literature associated with Vygotsky's (1978) zone of proximal development. Social constructivism recognises the role of social processes in learning (Wertsch, 2002). Peer collaboration is associated with both cognitive and social constructivism with 'cognitive conflict' being identified as a central process which results in cognitive change (Tudge, 2000, p. 5). Cognitive constructivism focuses on the structures of cognition which Piaget termed 'schemas' (Piaget, 1977, p. 6). Tudge (2000) distinguishes between peer collaboration which occurs between peers of equal status and peer tutoring which happens between children who have different levels of competence. This is an important distinction which is made throughout the literature in this area. For the purposes of this study, the following definitions are used:

Peer tutoring "involves an experienced peer assisting an inexperienced peer in completing a task" (Johnson-Pynn & Nisbet, 2002, p. 241).

Peer collaboration occurs when "everyone has a more or less equal role in constructing knowledge. All members of the group, whether a whole class group or a small one, have equal value although their contributions are various. Collaborative learners complement and build on each others' views to construct shared knowledge" (Hargreaves, 2007, p. 188).

Cognitive conflict "is a perceived feeling of contradiction between what the child knows and what the world (peers) is telling the child" (Williams, 2001, p. 36).

Search terms

The databases used to search for literature on peer learning included the ERIC online database, A+ Education, Academic Search Elite and Index New Zealand. The search terms used were peer tutoring, peer collaboration, peer learning, cognitive conflict, cognitive constructivism and social constructivism. These terms were paired with the descriptors early childhood, early years, child care, kindergarten and young children. The search was limited to studies within the last ten years with the exception of some earlier studies that make a useful contribution to the discussion here. The Massey University library catalogue was used to search for books and New Zealand theses. The resulting literature draws upon empirical studies, reviews of research and theoretical articles and books. As this study was conducted in early childhood centres, the literature reviewed here focuses on research which was carried out with young children. Much of the literature on peer tutoring is based in classroom settings and so this has been included where appropriate.

Theories of cognition

There are many explanations of cognitive development and learning. Cullen (2001) identifies two major strands of research which are relevant to peer learning. The first is the cognitive constructivist approach which is centred on the individual learner's construction of knowledge as they interact with their environment (Bjorkland, 2000; Flavell, Miller & Miller, 2002). "Constructivism is a process in which the individual reflects on and organises experiences to create order in and adapt to the environment" (De Lisi & Golbeck, 1999, p.5). Piaget took a constructivist position and his ideas underpin much of the research adopted in this approach.

The second strand of research is termed social constructivist and this is underpinned by Vygotsky's cultural historical approach in which learning and understanding are regarded as a social endeavour. "Learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers" (Vygotsky, 1978, p. 90).

Cullen (2001) draws attention to the increasing 'interface' of the cognitive constructivist and social constructivist theories in research on children's learning. Both theories view knowledge as an individual construction, however Vygotsky believed that knowledge is mediated by social factors and consequently his theory emphasises the transmission of culture to the child (Wadsworth, 1996). Piaget did accept that social experiences play an important role in development; however they play a secondary role in his theory (Wood, 1998). Piaget and Vygotsky have had a major influence on our ideas about how children learn, however an in-depth discussion of their theories is not possible here. The following discussion draws on the key ideas from these two theoretical approaches which are most relevant to peer learning.

Cognitive constructivist approach

The concept of constructivism is central to Piaget's concept of the active learner (Cullen, 2001; Flavell, 1977; Piaget, 1977). Through interaction with the environment, individuals construct knowledge and undergo cognitive change. When seeking to explain the construction of knowledge, Piaget's theory focuses on the internal aspects of the learner as they develop their own understanding of the world around them (Piaget, 1977). Piaget used the term schema to describe the cognitive

structures by which individuals adapt to and organise the environment (Piaget, 1977). Schemas constantly change, becoming more refined as children develop.

The processes which are responsible for this change are assimilation and accommodation. Assimilation is the cognitive process by which the child integrates new perceptual matter into existing schemas or patterns of behaviour (Piaget, 1977). The process of assimilation allows for the growth of schemas. However, sometimes a new stimulus cannot be assimilated because there are no schemas into which it fits. Therefore, the child must accommodate their existing thinking by either creating a new schema or modifying an existing schema so that the stimulus will fit into it (Piaget, 1977; Wadsworth, 1996). Once accommodation has occurred, the child can try again to assimilate the stimulus and this time as the structure has changed, the stimulus is readily assimilated. Knowledge is constructed by these complementary processes of assimilation and accommodation (Bjorkland, 2000; Wood, 1998).

The idea of equilibrium is central to Piaget's theory and when accommodation and assimilation are balanced and neither is dominant, then equilibrium is achieved (Piaget, 1977). However, an imbalance between assimilation and accommodation can occur when the expectations or predictions that the child has are not confirmed by the experience (Wadsworth, 1996). The resulting disequilibrium, or cognitive conflict, occurs when an individual's current understandings are challenged by contradictory views (Flavell, 1977). These contradictions promote a search for coherence (Piaget, 1977). Working collaboratively with peers provides a context for disequilibrium and Meadows (2006) identifies conflict with peers as one of the few social aspects of cognition that Piaget focused on.

The role of peer interactions from a Piagetian perspective can offer an opportunity for the disequilibrium of thought, leading to a transformation of ideas which result in new understanding or development (Tudge, 2000). As children work together they challenge each other by offering alternative viewpoints which lead to the trying out of new ideas; a resolution of the conflict caused by contradictory views results in re-equilibration and new understanding. The importance of this process is described by Flavell who states that "according to Piaget, states of cognitive conflict and disequilibrium impel the child to make cognitive progress" (Flavell, 1977, p. 242). However the role of social interactions in this process is only effective if the child is in a state of 'readiness' (Wood, 1998, p. 16).

Both Palinscar (1998) and Tudge (2000) argue that peer interactions are more likely to bring about cognitive development than teacher-child interactions as children have equal status and shared perspectives. Cognitive conflict results in the construction of new knowledge through the active exchange of ideas and exploration of alternative viewpoints amongst children as they work together. Cognitive conflict helps a child to restructure their thinking, bringing about the next stage of development (Wood, 1998). This illustrates the powerful role which cognitive conflict can play when children work collaboratively.

Social constructivist approach

Social constructivism is based around the ideas of Vygotsky's (1978) cultural historical theory, proposing a participation model of learning in which the internalisation of knowledge is derived through social interaction. Vygotsky's ideas were heavily influenced by Marx's theory of society which takes the view that historical and societal changes produce changes in human nature (Cole & Scribner, 1978). He related this proposition to concrete psychological questions, drawing on

Engels' concept of human labour and tool use as a means by which man changes nature and transforms himself (Cole & Scribner, 1978). The concept of mediation is central to Vygotsky's theory as he claims that human action on both the individual and social planes is mediated by tools and signs (Wertsch, 1991). All higher mental functions have social origins, that is they first appear in interactions between people before they are then internalised. Vygotsky (1978) theorised that children learn culturally relevant concepts and practices as they observe and participate in the everyday lives of their families and communities. As children participate in these experiences, they are supported by their peers with whom they develop shared understandings.

Vygotsky considered the relationship between language and thought to be especially important. He was particularly interested in language and how it mediated human action (Vygotsky, 1978). He stated that "the relation between speech and action is a dynamic one in the course of children's development" (Vygotsky, 1978, p. 27). As children participate in meaningful experiences with more knowledgeable others, there are opportunities for children to internalise the language being used. Palinscar (1998) states that from a social constructivist perspective discourse is the primary symbolic tool for cognitive development. Therefore it is verbal interaction which is the key to cognitive change, although this idea is challenged as being ethnocentric (Moll, 1990).

The zone of proximal development is a key concept within Vygotsky's theory. Vygotsky (1978, p. 86) defined it as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance

or in collaboration with more capable peers". The zone of proximal development recognises the potential for learning rather than defining a child's capability by what they have achieved developmentally at a particular point in time. Tutoring by a more competent peer can be an effective aid in passing through the zone of proximal development (Vygotsky, 1978).

'Scaffolding' is a term coined by Wood, Bruner and Ross (1976), based on Vygotsky's theorising, to describe the support given by adults or more capable peers within the zone of proximal development, thus ensuring success in the child's attempts to learn. Scaffolding involves supporting children's efforts by breaking down aspects of a task and focusing a child's attention towards a goal (Rogoff, 1990). This support can be provided by more capable peers and Vygotsky (1978) emphasised the importance of mixed-age grouping of children as this means they can access more knowledgeable peers and in doing so, the more capable child can act as a resource for others. Contingency management is an important part of scaffolding and this occurs when the level of support is adjusted by the more capable child so that their peer achieves success (Tharp & Gallimore, 1991).

The ideas of Barbara Rogoff (1984, 1990, 1998 & 2003) have contributed to post-Vygotskian debate and are significant here. Rogoff (1998) identifies a key premise within sociocultural theories whereby individual, interpersonal and cultural processes are not independent entities, rather they are connected. Therefore, analysis of children's learning must consider individual, social and cultural processes. Rogoff (1998) proposes the use of differing planes of observation and analysis to consider children's thinking through three different foci. The focus of analysis can be on individuals, their interactions with others, or on the institutional or community context in which learning occurs. Any one of these can be in focus, while the others are present in the background. The intrapersonal, interpersonal

and institutional planes of analysis have been used to analyse the data collected in this study (see Chapter Six).

Rogoff (1990) emphasised the importance of the collaborative aspect of cognition, as leading to a level of understanding which children working by themselves are unable to achieve. As children move towards this new level of understanding, they are involved in a process which Rogoff (1998, p. 690) terms a 'transformation of participation', in which individuals develop through involvement in shared endeavours. As they participate in learning experiences with their peers, their knowledge is transformed. This process sits within a 'community of learners' model, in which learning is a result of ongoing involvement in sociocultural activities (Rogoff, 1998, p. 715; Brown, 1994). Within a community of learners model, children learn in an apprenticeship process as less experienced individuals are guided and supported by more capable peers. As children work alongside their peers, they share a focus or purpose which is defined as intersubjectivity (Rogoff, 1990). The presence of intersubjectivity is necessary if children are to move past their current level of understanding and co-construct new understandings with their peers. The community of learners model emphasises that learning occurs through a process of social participation.

The idea of children co-constructing new understandings was first discussed in the literature by Verdonik (1988). More recently, Cullen (2001, p. 54) has described co-construction as combining "the two views of active constructive learner and the expert 'tutor' to explain how learning occurs collaboratively in the context of shared events and interests". Jordan (2004) asserts that the term 'co-construction' positions the child as a powerful player in the learning process. Learning occurs through processes of negotiation and collaboration between peers.

Summary

The cognitive constructivist and the social constructivist approaches make an important contribution to our understanding of how children learn from each other, providing a theoretical framework for research into peer learning. The inclusion of both interpretations of constructivism strengthens this study as each approach offers particular insights into peer learning.

Children's strategies in peer learning

There are a number of studies which examine the strategies that children use when engaging in collaborative endeavour with their peers and these are identified and discussed here. The strategies adopted in collaborative interactions can differ from those in peer tutoring; consequently the studies have been grouped accordingly.

Peer collaboration

Earlier studies of young children's peer interactions provided evidence that from the age of three, co-operative play is more frequent and intersubjectivity is increasingly established in play (Cannella, 1993; Farver, 1992; Goncu, 1993). Achieving intersubjectivity is necessary if children are to experience cognitive growth. Farver (1992) observed forty children, aged two to five, who were in same age and same sex dyads as they played with a fantasy toy. The results showed that the children used a range of communicative strategies to create shared meaning during spontaneous play. The children negotiated ideas and built on each other's responses as the play unfolded. Goncu (1993) videotaped the play sessions of twelve three-year-olds and twelve four-and-a-half-year-olds who played together in same age and same sex dyads. The children negotiated their ideas with each other in order to achieve intersubjectivity, extending their partner's ideas as they were

expressed and responding to these with further suggestions. This created a joint purpose which the children continued to negotiate throughout the play session. Together, these studies emphasise the critical presence of a shared purpose in constructing knowledge and the importance of negotiation as a strategy for achieving this.

More recent studies (Brownwell, Ramani & Zerwas, 2006; Goncu & Weber, 2000; Howe, Petrakos, Rinaldi & LeFebvre, 2005; Leseman, Rollenberg & Rispen, 2001) had similar findings. For example, Howe et al. (2005) investigated children's constructions of shared meanings in play. The sample consisted of forty children aged five years old, paired with their younger or older siblings. They discovered that children as young as three began to use communicative strategies to build on their partner's utterances to construct shared meanings in play. These collaborative negotiations were effective in extending the children's play. This study provides evidence that very young children can achieve joint understanding with their peers by collaboratively negotiating ideas. It also demonstrates that children accommodate and adjust their responses in order to construct shared meaning with their peers.

Some of the studies discussed previously in this section have been conducted in formal, laboratory type environments and both Goncu (1993) and Cannella (1993) state the need for additional research which examines the nature of collaborative interactions between young children in naturalistic settings. As researchers have begun to acknowledge the contribution that the social context makes to learning, they have taken up this challenge and the result is a growing number of studies which examine collaborative strategies and are based in classroom or early childhood settings.

There are a group of studies which examine the collaborative interactions amongst young children as they work together at computers (Chung & Walsh, 2006; Hyun & Davis, 2005; Lomangino, Nicholson & Sulzby, 1999). In these studies, the researchers observed the children (ranging in age from five to seven across these studies) as they worked together in pairs or groups to write stories or complete projects using computers within the classroom. Hyun and Davis (2005) found that the children used dialogue to construct meaning and extend learning as their technological skills developed. The children engaged in purposeful thinking, questioning and collaborative talk which led to joint problem solving. Furthermore, once the children were familiar with the technology, they became consultants to their peers and teachers, offering them assistance with the use of computer software.

The use of peers as a resource is similar to Chung and Walsh's (2006) study in which the children were found to adopt different roles with their peers as they collaborated together. Repeated sessions of peer collaboration allowed the children to become familiar with each other and the roles of leader and observer began to be alternated. This led to the development of a more symmetrical relationship and more opportunities for the younger children to play the teacher. This shift in roles was attributed to the fact that the children had established sound relationships with each other as a result of working together closely with the same person over a series of weeks and also that they had some experience of working collaboratively with a peer.

Peer tutoring

Within the international and New Zealand literature there is a large body of research which investigates the effectiveness of peer tutoring within a particular

curriculum area in classroom settings. The children in these studies are typically paired together and the environment is configured to specifically support opportunities for children to tutor each other (e.g. Belsham, 2000; Chung & Walsh, 2006; Fair, Vandermaas-Peeler, Beaudry & Dew, 2005; Brown, 2006; Johnson-Pynn & Nisbet, 2007; Rowe, 2002; Wang & Hyun, 2009; Wilson, 2007 and Wood & Frid, 2005). These studies provide strong support for peer tutoring amongst young children within specific contexts. They also reveal the strategies which peers use to tutor each other and consequently some of these studies will be discussed here. However it is important to note that although there is anecdotal evidence of peer tutoring within the play based environments commonly found within early childhood centres in New Zealand, there are no in-depth studies in this particular setting.

Quantitative methods were used by Garton and Pratt (2001) and Johnson-Pynn and Nisbet (2002) to investigate children's peer tutoring strategies as they worked together using blocks. Twenty eight pairs of three-to-five-year-old children in Johnson-Pynn and Nisbet's (2002) study constructed a house out of blocks. The aim of this study was to obtain a profile of the tutoring capabilities of three-to-five-year-olds. The frequency of both the verbal and nonverbal aid provided by the expert (those with task experience) to the novice (those children without task experience) was scored. The findings provided evidence of children as young as three assisting their peers spontaneously, making statements which indicated their willingness to 'teach' their peers. The experts provided a variety of forms of assistance to the novices, including strategies to approach the task and statements to motivate the novice. The researchers were surprised by the capabilities of the preschool age children, concluding that they can capably assume the role of a peer tutor.

Although this study identified a range of peer tutoring strategies, the quantitative methodology used did not allow an examination of the underlying processes which

result in the less capable child being able to complete the task. In pairing the children and giving them a specific task, accompanied by instructions, the focus of this study was on identifying the children's actions and verbal strategies; further analysis of other processes (such as dealing with cognitive conflict and working successfully within their partner's zone of proximal development) was not possible. The study by Garton and Pratt (2001) revealed similar difficulties in research design and they acknowledged that their use of an experimental paradigm was restrictive. Garton and Pratt (2001) suggest that further studies need to examine the nature of children's interactions to ascertain how children select their peers on the basis that they are a source of knowledge, expertise and skill.

In contrast, the use of case study methodology has allowed a more in-depth explanation of peer tutoring in the studies by Fair, Vandermaas-Peeler, Beaudry and Dew (2005) and Wood and Frid (2005). Wood and Frid (2005) conducted a case study in a pre-primary classroom setting with children between the ages of five and seven. A qualitative research paradigm was selected in order to provide rich, descriptive data (Wood & Frid, 2005). The children were engaged in numeracy activities and the researchers used running records, reflection notes and video recordings to gather data on the interactions between the children as they tutored each other; teacher practices were also a focus. Data analysis revealed the use of scaffolding as the more capable children took on leadership roles and guided their less knowledgeable peers. The presence of intersubjectivity was found to be essential if the children were to effectively scaffold their peers. The study highlighted the presence of cognitive conflict as a critical factor which enabled the children to reach a new, joint understanding with their peers. The study also highlighted the importance of specific teacher practices such as fostering a problem-solving approach to support numeracy learning and establishing a social

environment based on peer sharing and tutoring. The use of case study methods identified implications for teaching practice and Wood and Frid (2005) acknowledge the use of qualitative methods as providing insights into actual processes in a classroom.

The study by Fair et al. (2005) used similar methods and paired eight and nine year olds with four year olds to do craft activities. The findings revealed evidence of the older children scaffolding their younger buddies. They demonstrated the use of contingency management when working with their buddies. This involved the older children gauging the ability of the younger child and then adjusting the support they provided accordingly. Intersubjectivity occurred at a high level and was achieved through a mutual interest in the activities and also in the relationships that were formed between the experts and the novices. Fair et al. (2005) emphasised the importance of the social links that were formed between the partners and genuine affection between partners was observed in the videotaped sessions. The researchers noted that the findings were limited by the small sample size of twenty four children, however they emphasised that their use of observations, journals and interviews provided rich data which highlighted the scaffolding process which was so successfully used in this social context.

There are a number of peer tutoring studies in bilingual settings which use language learning as a lens through which to examine the role of peer talk (Angelova, Gunawardena & Volk, 2006; Barnard, 2002; Wang & Hyun, 2009) and their findings make a useful contribution here. These studies investigate the peer tutoring strategies used by children in bilingual settings and in the case of Barnard's New Zealand study (2002), the children worked with peers from non English speaking backgrounds.

Angelova, Gunawardena and Volk's year long study (2006) of six-and-seven-year-old children in a dual Spanish/English classroom used ethnographic methods such as participant observations, field notes and videotaping to examine the teaching and learning strategies co-constructed by peers. Data analysis found that the children acted as resources for each other as they co-constructed language. Secondly, they acted as peer teachers for each other using a range of strategies. Thirdly, the roles of expert and novice in these peer interactions were fluid and changed depending on the context in which the interactions occurred; the English speakers were experts in the English classroom and the Spanish speakers were experts in the Spanish classroom. The researchers drew on Vygotsky's zone of proximal development as a dynamic concept which was created in the course of the peer interactions (Angelova et al., 2006).

Barnard's (2002) findings are commensurate with this study, emphasising that the presence of the zone of proximal development is an important factor which partly determines the success of the scaffolding provided by the expert child. In addition, Barnard (2002) found that the less capable children viewed their more capable peers as a source of knowledge and consistently sought their assistance. These peer tutoring studies in bilingual settings provide evidence of how the zone of proximal development can allow children to extend their peers' understanding and act as experts who are seen by their peers as a source of knowledge. Language was an important mediating tool in these studies.

The role of language in meaning making has also been investigated in a number of studies on peer learning (Alcock, 2007; de Haan & Singer, 2001; Lofdahl, 2005; Odegaard, 2006; Rayna, 2001). Both Alcock (2007) and Odegaard (2006) observed children aged from two to four years as they interacted with their peers during mealtimes in early childhood centres. The findings from both studies provided

evidence of meaning and thinking being constructed during collective dialogue. Odegaard concluded that the children were active co-constructors of meaning rather than passive recipients in the learning process. The use of language to express togetherness was a common theme in both studies and Alcock noted that as children played with the rules around language they were motivated towards group togetherness. Alcock concluded that this togetherness was dependent on peer involvement rather than teacher participation. The children in Alcock's study collectively created meaning as they negotiated and played with the rules around routine mealtimes. Repetition, imitation and imagination were important aspects of their word play. These studies provide evidence of the critical role of language in children's developing understandings.

Summary

The studies discussed in this section provide evidence of the ability of young children to effectively tutor their peers and to work collaboratively, thereby extending their own learning and that of their peers. The studies found that a shared purpose was critical for constructing knowledge. Children used negotiation, problem solving and collaborative talk to work together. There was also evidence of the children using their peers as resources. The peer tutoring studies found that placing children into the role of either expert or novice was ideal for encouraging peers to scaffold each other through the zone of proximal development. Language was found to play an important role in both meaning making and establishing a sense of togetherness with peers. Finally, it is possible to identify a shift from quantitative research using experimental approaches to enquiries conducted in naturalistic settings using qualitative methodologies; this reflects repeated calls

from within the field for studies which explore the underlying processes within peer learning.

Children's perspectives

Less attention has been paid to the child's perspective within the literature on peer learning. Smith (1998) claims that in the area of children's learning the child's perspective is a relatively recent area of research. She argues that this can be partly attributed to the tendency to view children as passive in the learning process, whereas more recent sociocultural perspectives view children as capable and competent and deem that their perspective is important and worthwhile to discover. Postmodern ideas have contributed to this view with children being seen as actively constructing their own identity, knowledge and culture (Dahlberg, Moss & Pence, 1999; James & Prout, 2001).

The studies presented here examine the awareness that young children have of teaching their peers and their knowledge of the different teaching techniques which can be used to ensure that their partner remains on task and engaged. Evidence which suggests that children recognise their peers as sources of knowledge is also presented and discussed. It should be noted that a limitation of these studies is that they are all small scale and the samples are all fairly homogenous.

There has been some investigation in the literature of children's understanding of key aspects of the peer tutoring process (Barone Schneider & Barone, 1997; Fair, Vandermaas-Peeler, Beaudry & Dew, 2005; Jones, 2007; Smith, 2008; Williams, 2001; Williams, 2007). In an earlier examination of this topic, I investigated the peer tutoring process in a buddy class in a New Zealand primary school. A class of nine and ten year olds were paired with five and six year olds to do activities for an

hour once a week. When the older children were asked what they liked about the buddy class, their responses demonstrated awareness of their teaching role. This awareness led to the children adopting expert roles and expressing their expertise to their younger peers with statements like "I've done this before and I know" (Smith, 2008, p. 10).

Williams (2001) interviewed children about their conceptions of peer collaboration and peer tutoring. The study involved twenty children aged between seven and nine years. The older children's responses to how they taught a younger child something, indicated that they used strategies such as imitation, telling, modelling and organising learning situations. They defined collaboration as working together, recognised the role of cognitive conflict and identified that there can be both agreement and disagreement in the collaborative process. The researchers noted that the children considered each other's differences to be an advantage, since it gives them opportunities to learn new things from each other (Williams, 2001). A further finding from William's study (2001) was that the children recognised their peers as resources for each other when the teacher was not available to help.

This phenomenon was explored further in a study by Sheridan and Pramling Samuelsson (2001) who interviewed thirty nine five year old children about their conceptions of decision making and opportunities for them to exercise influence in their pre-school setting. The children's conceptions were related to a variety of experiences of which their interactions with their peers were considered a part of. The results showed that it was together with their peers that children experienced reciprocity, participation on equal terms, taking turns, discussing and negotiating. The children were able to recognise when their peers were taking on a role of extending their learning and expressed this as a preference to play with the child they perceived as being more competent. This is an important finding as it identifies

the ability of children to recognise the opportunity which their peer is giving them to extend their own understanding. This relates closely to Vygotsky's (1978) idea of children being guided by a more competent peer.

Summary

In seeking the child's perspective of the peer tutoring process, researchers have highlighted how important these shared interactions can be for extending children's learning and for creating opportunities for children to take on a teaching role as they quite clearly have some conception about what teaching and learning mean. Examining the child's perspective provides another lens through which to gain further insight into what children understand about the value of working with their peers. Further research of this aspect of peer learning could involve larger studies with more diverse samples; this would be useful as it would allow further comparison between different teaching and learning environments.

The role of the teacher in peer learning

This section of the review presents research which identifies the role that teachers play when fostering peer learning. Initially, a major review of research on peer learning in classroom environments is discussed. There has been little study of this aspect of peer learning within play based environments and there are some calls for research in such settings. The discussion then focuses on studies which identify aspects of teacher's practice which promote effective peer learning. The connection between teachers' beliefs about how children learn and their practice is explored here. Finally, the different understandings that New Zealand teachers have of their role in working within a sociocultural framework which underpins the national curriculum Te Whāriki (Ministry of Education, 1996) are examined.

The importance of the teacher's role in peer tutoring is evident in a key review of research in this area which was conducted for the Ministry of Education in New Zealand (Wilkinson, Hattie, Parr & Townsend, 2000). The review focused on the influence of peer effects on learning outcomes emphasising the importance of peer learning, while acknowledging the complexity of the process and the elements within it. The researchers identify the teacher's role along with task instructions, student preparation and student roles as key characteristics which affect the promotion of shared understandings and the joint construction of knowledge when students work together collaboratively (Wilkinson et al., 2000). Within the peer tutoring process, Wilkinson et al. (2000) identify observation, monitoring of interactions and outcomes and direct intervention to scaffold learning or to participate in the co-construction of knowledge as important roles for teachers.

There is a dearth of literature which investigates the teacher's role in peer learning within play based environments; this thesis will hopefully go some way to addressing this gap. A review of early years research into pedagogy and adult roles carried out by the British Educational Research Association (Aubrey, Anning, Calder, & David, 2003), identifies the critical role of the adult in supporting young children's co-operative potential. The review highlights the need for observation based studies which focus on the types of scaffolding needed to enable children to sustain collaborative endeavour. The authors call for further understanding of the complex processes within co-operative endeavour. They argue that observation is a key method for identifying these complex processes in action. This point has helped shape the research design for this study.

There are a group of small scale studies of young children in classroom settings which provide evidence of the need for teachers to provide opportunities for peer talk amongst children when they are working together (Brown, 2006; Burnard,

Craft, Cremin, Duffy, Hanson, Keene, Haynes & Burns, 2006; Fawcett & Garton, 2005; Pantaleo, 2007; Wood & Frid, 2005). The studies by Pantaleo (2007) and Brown (2006) examined the collective activity that young children engaged in during class reading time. The need to create meaningful opportunities for student talk was highlighted as being of critical importance for joint thinking in both of these studies. The teacher was found to play an important role in encouraging and extending this talk. This study emphasised the need for teachers to provide thoughtful, engaging activities and to become critically aware of how they use language and how they encourage children to use language.

An in-depth investigation of children's collaborative interactions has important implications for the teacher's role. Fawcett and Garton's (2005) study of 106 seven year olds who were paired to complete a block sorting task, found that the active exchange of ideas, rather than merely working together, was a critical factor if there was to be cognitive change. As the children sorted the blocks, they were required to explore and clarify inconsistencies or misunderstandings in their explanations, elaborate ideas and evaluate the success of the task by giving appropriate feedback. The complexity of this process promoted opportunities for cognitive conflict where the children were given the opportunity to explore their partner's perspective and to restructure their own knowledge and thinking.

However, Fawcett and Garton (2005) emphasised that simply creating opportunities for children to work together did not necessarily guarantee cognitive change. Studies by Wood and Frid (2005) and Hagan (2007) support this premise. Fawcett and Garton (2005) suggested the need for children to be trained in interactive skills such as providing explanations and being sensitive to the needs of their peers. They also suggested that the tasks needed to be appropriate to the capabilities of the children and structured so that the children must work together co-operatively to

successfully complete the task. Another important implication for teachers was the need to ensure that children who were grouped together had different skill levels or perspectives. This would ensure the identification of a zone of proximal development (Vygotsky, 1978) and it would ensure the opportunities for cognitive conflict which are important from a Piagetian perspective (Flavell, 1977).

In Wood and Frid's study (2005) the teachers modelled appropriate and effective peer interactions, they supported the children's peer learning through direct guidance and questioning and they used choice as a means of guiding children in their problem solving. The authors concluded that effective learning was dependant on the teacher's ability to develop productive discussion amongst children using an inquiry process (Wood & Frid, 2005). The adoption of an inquiry process is emphasised by Siraj-Blatchford (2004) who highlights the need for teachers to provide opportunities for children to engage in sustained shared thinking as this promotes cognitive growth.

Teachers' beliefs

There is a body of research, including some New Zealand research which investigates the complex relationship between teachers' beliefs and their practices. The findings from these studies are relevant to teachers' beliefs about how children learn from their peers (Brown, 2004; Errington, 2004; McLachlan-Smith, 1996; Nuttall, 2004; Pajares, 1992; Rivalland, 2007; Stephen, 2010). Pajares (1992) terms teachers' beliefs a 'messy construct' and the following examples of empirical research illustrate this premise.

Rivalland (2007) investigated the relationship between child care professionals' beliefs and practices and how they articulated their beliefs about learning and teaching. A qualitative case study, carried out over three months using document

analysis, observations and teacher interviews, found that on one level the teachers' beliefs were aligned with centre documentation and on another level there were variations in interpretation. Some of these variations were found to indicate underlying tension between teachers' beliefs and their practice. Rivalland (2007) concluded that belief systems are complex as the enactment of official discourse depends on the individual's interpretation and connectedness to their personal belief systems.

These findings are upheld in a more recent study by Stephen (2010) who investigated the influences of pedagogy in early years settings with fourteen practitioners over one year. The researchers observed children working with technology in preschool settings and these observations were shared with the teachers from the settings involved. A plan-act-review cycle of guided enquiry enabled teachers to plan interventions, observe children's engagement and then comment on their own practices. The results revealed that although the teachers were able to plan and then endorse children's engagement in meaningful activity, they were reluctant to engage in discussion about their practices. In addition, the findings revealed that the teachers endorsed the rhetoric of children's purposeful engagement in meaningful activities but that children's learning experiences were in fact varied and the teachers were not always aware of their own practices. Stephen concluded that policies, personal beliefs and the value systems of communities of practice influence teachers' practice and therefore children's learning experiences.

In addition to empirical evidence, Fein and Schwartz (1982) and Genishi (1992) provide a useful analysis of the way teachers develop their understandings about practice. Genishi (1992, p. 198) identifies "theories of practice" as the theories which underpin the decisions teachers make about curriculum and their role in children's learning. Theories of practice are prescriptive as they guide teachers

when planning learning environments and they recommend how teachers should view development (Genishi, 1992).

In contrast, Fein and Schwartz (1982) identify theories of development as descriptive as they explain how development occurs from birth to adulthood. Theories of development don't address the teacher's role in children's learning, nor do they provide guidance on how to set up learning environments. Fein and Schwartz (1982) recommend a reciprocal relationship between theories of practice and theories of development. Genishi (1992, p. 198) supports this recommendation as a "logically powerful one" as theory can be used to demonstrate that practices are theoretically sound. However, Genishi (1992) found when talking with teachers across six early childhood settings that they were unable to clearly articulate connections between theory and practice. Instead their approach was eclectic, drawing from a range of theories and demonstrating a preoccupation with elaborating on theories of practice.

Te Whāriki

In the New Zealand Early Childhood Curriculum Te Whāriki, (Ministry of Education, 1996) social constructivism has a strong presence. The emphasis is quite clearly placed on relationships and the social context and the document highlights the importance of children learning through collaboration with both adults and their peers. The document also reinforces the notion of learning occurring through individual exploration of the surrounding environment. This reference to children learning through exploration is one aspect of the document which reveals the presence of a cognitive constructivist paradigm which sits alongside the strong sociocultural base underpinning Te Whāriki (Ministry of Education, 1996). The presence of both sociocultural and cognitive constructivist and other developmental

theories has created a tension in the document for teachers as they seek to interpret and define their role in children's learning (Cullen, 2001).

There are many discussions and debates in the literature about the open and interpretive nature of Te Whāriki and the resulting diversity of pedagogical approaches (Alvestad, Duncan & Berge, 2009; Clark, 2005; Edwards & Nuttall, 2005; Haggerty, 2003; Loveridge & McLachlan, 2008; Nuttall, 2005). The presence of developmental theory within Te Whāriki is one challenge which is acknowledged by researchers in the field (Cullen, 2001; Greenfield, 2002; Nuttall, 2003). Cullen (2001) highlights the tension for teachers of a document that retains a developmental philosophy with the focus on children learning through play while at the same time "the role of socially and culturally mediated learning is espoused" (Cullen, 2001, p. 64). The resulting tension means that teachers are sometimes unsure about their role in children's learning.

In a recent publication on early childhood curriculum in New Zealand, the authors identify Te Whāriki as being underpinned by a 'learner-centred' ideology which is humanist in orientation and learning is seen to occur through the child's interaction with the environment (McLachlan, Flear & Edwards, 2010, p. 17). A 'learner-centred' ideology supports diverse philosophies of teaching and learning and the needs of the individual child dominate (McLachlan et al., 2010). The presence of diverse teaching and learning philosophies within the sector reflects the interpretive nature of Te Whāriki. Clark (2005, p. 21) supports the idea that Te Whāriki is interpretive, stating that although there is a national early childhood curriculum, "the practicalities of practice have to be interpreted by each service".

Summary

As the studies discussed suggest, the teacher plays a critical role in supporting children's collaborative endeavour within play. These studies provide evidence of how teachers can support collaboration through providing opportunities for peer talk and the active exchange of ideas which encourages children to consider different perspectives, challenging and extending their thinking. How children are grouped is also an important consideration if children are to learn from each other. The nature of teachers' beliefs and how these are enacted is complicated and an area which needs further research. The open and interpretive nature of Te Whāriki adds to this complexity.

The role of the environment in peer learning

In this final section, the role of the environment in fostering peer learning is discussed. Several key components of the environment are outlined, including the importance of a supportive atmosphere, considerations around grouping, the types of resources and activities that are available to support collaborative play and the routines that structure children's play in early childhood centres.

Studies within the literature on peer learning (Brown, 2006; Burnard et al., 2006; Fawcett & Garton, 2005; Pantaleo, 2007; Wood & Frid, 2005) emphasise the need for a supportive environment which promotes collective activity amongst children. Wood and Frid (2005) conducted a case study examining numeracy teaching and learning strategies in an early childhood multi age setting where the children were aged between five and seven. The teachers fostered an atmosphere based on trust, understanding and common goals, allowing the children to take responsibility for their own learning alongside their peers. The children shared their ideas and helped

each other and they were supported to take risks and work autonomously alongside their peers. Burnard et al. (2006, p. 258) refer to such an atmosphere as an 'enabling context'. Within such a context is the notion of power sharing amongst teachers and learners. Children are provided with opportunities to make decisions and direct their own learning.

In a collaborative early years context, Burnard et al. (2006, p. 255) worked with teachers on a research project which focused on developing a framework for 'possibility thinking'. The project was conducted in three early years settings and used participant and non-participant observations, event sampling and video stimulated review of classroom interactions to gather data. The conversations with the teachers revealed that the teachers saw the shared control of learning as significant as it promotes the idea of a safe learning environment. The children, aged between four and seven years, were viewed as active participants in the learning process and the teachers actively sought to provide a learning environment that was enabling for children. The provision of such an environment can be connected with a sense of empowerment which is one of the underlying principles of the New Zealand early childhood curriculum, Te Whāriki (Ministry of Education, 1996).

It is important to note that not all early childhood centres in New Zealand group children so that older and younger children spend extended periods of time together engaged in play. This has implications for fostering the Māori teaching learning principle of tuakana teina, in which the more experienced, older child (tuakana) is a support person for the younger child (teina). Mixed age settings support the concept of 'tuakana teina', providing opportunities for the older child to express what they know and the younger child to gain new understanding (Pere, 1991).

Teachers in a New Zealand kindergarten engaged in action research with a team of researchers to discover how teaching and learning could be improved in the multicultural setting that the kindergarten is part of (Haworth, Cullen, Simmons, Schimanski, McGarva & Woodhead, 2006). Throughout the research process, the teachers discovered that vertical groupings, in which older children worked with younger children, were a significant factor in children scaffolding and co-constructing learning with each other. The teachers recorded many incidents of the older children working with the younger children and this included many examples of a tuakana scaffolding a teina's learning, resulting in cognitive gains for both children. In taking on the teacher role, the tuakana is able to affirm and express their own knowledge and understanding (Haworth et al., 2006).

The concept of tuakana teina has been explored elsewhere in the New Zealand literature on peer tutoring (Pere, 1991; Grant, Medcalf & Glynn, 2003). Internationally, Katz (1989), a prolific writer in the field of early childhood education, has openly criticised the grouping of children into single age groups. In an extensive review of the research findings on the social and cognitive aspects of mixed age grouping, Katz (1989) advocates for mixed age grouping in schools and early childhood centres because of the social and cognitive benefits. She claims that the concepts of cognitive conflict and the zone of proximal development provide the theoretical justification to support mixed age groupings. Studies by Dunn (1996) and Prendergast (2002) report similar benefits in their studies on mixed age grouping in early childhood centres.

Early childhood centres in New Zealand promote the idea of children learning through play and Pohio (2006) has examined the use of visual art as a medium for promoting peer collaboration in early childhood contexts. Her findings indicate that the environment plays an important role in influencing the nature of children's

interactions. The kindergarten where Pohio (2006) observed children's play was set up to encourage co-operative endeavour. Children were able to self select from a range of materials which were easily accessible and which actively supported the children's enquiry in meaningful ways. The equipment was arranged to encourage the co-operative use of resources and to foster the growth of collective knowledge. Pohio (2006) notes that these environments do not just happen but need to be specifically set up to foster and enhance collaboration. In an earlier study, Arthur, Bochner and Butterfield (1999) found that by altering the physical environment, teachers can effectively set the scene for peer interactions.

Young children spend a considerable amount of time engaged in routines in early childhood centres and Pohio's (2006) study of peer collaboration emphasises the need for routines that do not dominate or restrict the exploration of young children. This idea has been explored through New Zealand research by Claxton and Carr (2004) who advocate a learning environment which promotes a dynamic approach to learning dispositions. Claxton and Carr (2004, p. 91) assert that learning environments can be "prohibiting, affording, inviting or potentiating". Prohibiting environments are described as being when children move from one routine to the next and are unable to be engaged over any length of time and often collaboration is prohibited. However, potentiating environments involve frequent shared activity where children as well as adults take responsibility for directing those activities. This promotes a sharing of power amongst teachers and learners and children are encouraged to assist each other, viewing each other as sources of knowledge. Claxton and Carr (2004) provoke teachers to consider whether the learning environment they have created is powerful and encourages participation resulting in collaborative, complex learning for children.

Summary

The studies discussed here have important implications for creating learning environments where children can learn effectively with their peers. The evidence suggests that teachers need to create an atmosphere which values collaborative endeavour and which empowers children to negotiate and direct their learning. Many early childhood centres in New Zealand are organised so that similar ages are grouped together and this may result in there being less opportunities for children to take on a teaching role with their peers. However, the concept of tuakana teina needs to be nurtured. The role of routines as supporting rather than stifling collaborative endeavour is also highlighted.

Conclusion

The literature suggests that peer learning is an effective means of enriching children's cognitive development and an important tool to promote learning. The theoretical framework presented here is drawn from key ideas found within cognitive and social constructivism as both views of learning make a useful contribution to this study. An examination of the empirical research has revealed the wide variety of strategies that children adopt when working collaboratively and as peer tutors. However, there is little evidence of the types of strategies which children adopt in play based settings. The research demonstrates that young children have clear conceptions about their ability to teach their peers. In seeking to understand more about the underlying processes which support peer learning, researchers have identified the need for further studies which use qualitative methods as these allow comprehensive examination of the effects of particular learning environments.

There are some studies in the area of peer learning which identify important aspects of the teacher's role in classroom settings, however there have been few attempts to examine this in play based environments which are common throughout early childhood centres in New Zealand; this thesis does this. The nature of teachers' beliefs about how children learn and their impact on practice is complex, requiring further investigation. The role of the learning environment impacts on opportunities for peer learning and routines and the types of experiences that children engage in need careful consideration. Of concern is the grouping of children which can limit opportunities for older children to teach younger children. In addition, the literature emphasises the importance of creating environments which promote autonomy and power sharing amongst teachers and learners. Such environments allow children to direct their learning alongside their peers.

The literature identifies the need for further enquiry into peer learning amongst young children. Specifically, such enquiry needs to provide teachers with further understanding about how they can promote peer collaboration and peer tutoring in a play based environment. The purpose of this study is to further explore these issues.

Research questions

A number of key questions have arisen from this review of the literature on peer learning. These questions have formed the basis for this study and are listed below:

- What specific strategies do children use as they collaborate together and tutor each other in an early childhood setting?
- What knowledge do children have about learning from each other?

- What knowledge do early childhood teachers have about peer learning?
- How does the knowledge teachers have inform their practice in this area?
- Does a play based environment provide opportunities for children to work together as peer tutors, and if so how?

This study sought to explore and interpret peer learning as it unfolded in an early childhood setting. The following chapter outlines the methods adopted in this study and describes the participants and settings in which the data was gathered.

Chapter Three:

Methodology

Introduction

This chapter outlines the qualitative methods which have been adopted to investigate how learning is constructed between children and their peers. Initially, the epistemological perspective which underpins the study is identified, followed by a discussion of case study methodology. Careful consideration was given to the selection of the research sites and the reasons for this are outlined, including a description of the centres involved. A range of methods were used to collect the data and these are discussed. Observations of the children and teachers and interviews with the teachers were two key methods used to gather data on peer learning. A research journal was used to record conversations with the children and to document decisions made throughout the research process. The procedures for data analysis are defined and discussed including an explanation of the presentation of the results. Finally, the ethical considerations are explained and critiqued.

Methodological approach

Epistemological perspective

This present study is framed within a post-positivist paradigm which recognises the significance of the social context in the debate about how knowledge is constructed. This particular paradigm works within a relativist ontology, which acknowledges multiple realities, and is an interpretive epistemology, in which the knower and the known interact and shape one another, employing a naturalist set of methodological procedures (Stake, 2008). The choice of a post positivist paradigm acknowledges

the multiple world views of adults and children. Both are acknowledged as being active participants in the research process. Collins (2006) argues that a positivist paradigm does not account for social and cultural changes and is therefore inadequate for research in educational settings. This view of children as active learners underpins constructivist theories which form the key theoretical framework that this study is based upon.

Case study

Case studies investigate the complex, dynamic nature of relationships and events, providing a rich, detailed description of a particular setting or event. The in-depth nature of this approach is emphasised by Denscombe (2007, p. 35) in the following definition. "Case studies focus on one (or just a few) instances of a particular phenomenon with a view to providing an in-depth account of events, relationships, experiences or processes occurring in that particular instance". This detailed approach was particularly suited to this study, as it provided opportunities to gain valuable insights into the complexities of the peer learning process. The qualitative methods used here - interviews, observation, and the use of a research journal, helped to illuminate the reality of the particular setting (Scott & Usher, 1999), which in this case was the early childhood setting.

Within the case study approach, the strongest criticism is directed at the credibility of any generalisations which are made from the data gathered. However, Yin (2003) and Mitchell (2000) emphasise that case studies are generalisable to theoretical propositions rather than populations and that the validity of case studies depends on the robustness of the theoretical reasoning. This reliance on logical inference means that the data analysis process needs to be grounded in a strong theoretical base. In this study, data credibility relies on informed, comprehensive

connections to theory and systematic, thorough analysis of data. The comprehensive theoretical framework outlined in the literature review provides a robust framework for analysis.

Triangulation was used in order to enhance confidence in the findings of this case study. This involved seeing things from more than one perspective. The various methods adopted provided different perspectives on peer learning in these early childhood centres. Triangulation is critical because it validates the findings in terms of accuracy and authenticity (Denscombe, 2007). Each data source provided a point of reference for the other sources and the multiple sources of evidence used here achieve this triangulation.

In addition to the use of multiple methods, this study was conducted in two early childhood centres, based on the principle that the use of multiple cases would lead to a better understanding of peer learning in a play based environment. This is supported by Bassey (2003) and Stake (2008) who state that the differences between contexts can be illuminating, providing valuable knowledge about how a phenomenon occurs in different settings. Early childhood centres are diverse in their practices and environments. Therefore it was proposed that conducting this study in two centres would result in a more comprehensive understanding of the dynamics that emerge as children learn together, providing insights about the centres and their functioning, as well as offering potential hypotheses about areas of further research.

Participants and setting

The criteria for the selection of the early childhood centres included two factors. First, the centres needed to offer a curriculum based around sustained opportunities for child initiated play. This would allow the observations to be carried out as the

children played uninterrupted with their peers; this was important if the developing complexity of the children's peer tutoring and peer collaboration strategies was to be captured. A curriculum which is interspersed with regular teacher-led group times does not afford such opportunities. Lash (2008) used similar criteria for the selection of the kindergarten in her study of peer culture. Second, the centres needed to comprise of children who are grouped together for play in mixed age groups. Katz (1989) identified this as a key factor that promotes opportunities for peer tutoring. A mixed age group of children can provide opportunities for older children to adopt the role of experts with their younger peers, challenging and extending their current knowledge. Consequently, purposive sampling was used to select centres which met these criteria. Babbie (2008) defines this as a type of sampling in which selection is based on the researcher's judgement about what will be the most useful or representative sample.

The New Zealand Ministry of Education database was used to search for possible research sites. The centres which were selected, based on local knowledge of centres and their licensing requirements, have children of a range of ages attending who come from a variety of family backgrounds. After talking with my supervisors and reflecting on my own teaching experiences, a decision was made not to approach kindergartens as I have had all of my teaching experience in these settings and this may inadvertently influence the observations in some way. Wellington (2000) terms this reflexivity which he defines as being about interrogating yourself: who you are; what your influences are; and how this impacts on what you do. The Education Review Office reports on each centre were also accessed as these provided information about the type of programme that was operating within each early childhood centre. This was important in this study as

approaching centres that had sustained opportunities for child initiated play was a key consideration.

Centre A

Centre A is a privately owned centre that is licensed for forty five children over the age of two years. The centre provides a full day care and education service which caters for children between the age of three and five. The ethnic composition is mainly New Zealand European. There are seven permanent teachers, four of whom are fully qualified to a diploma or degree level and the other three teachers are in training. The programme is based mainly around opportunities for self-directed play and the teachers encourage the children to be self-managing. The learning environment is well planned and the children can easily access a wide variety of interesting resources. The routines are flexible and based around children's individual needs, consequently children are encouraged to eat when they want to; the kai (food) tables are set up in such a way that there are many opportunities for social interaction and conversation.

The inside areas are set up so that children can move freely between activities which include play dough, a dramatic play corner and music area, art tables, puzzles and storytelling. A more enclosed space provides an area for blocks and this is where group time happens at the start of each day. The outside area is very attractive with trees and vegetable gardens which the children have planted and take great pride in. A range of outdoor activities are available and these include water play, carpentry, swings and a large sandpit. The programme is based on the principles of Te Whāriki (Ministry of Education, 1996) and the teachers focus on projects which all the children can participate in; individual strengths and interests are recognised from these projects. Children's participation in learning is clearly

visible through individual portfolios (these are shared with parents) and wall displays.

Centre B

Centre B is operated as an incorporated society. It is licensed to provide full day care and education for up to thirty four children, including eight children under the age of two. The ethnic composition is mainly New Zealand European with some Māori children attending. There are a team of nine permanent teachers who are all fully qualified to a diploma or degree level. Children experience a balanced combination of child and adult initiated ideas and projects. The programme is based around the principles of Te Whāriki (Ministry of Education, 1996). The teachers plan for individual and group interests and children's emerging interests are displayed for parents and whānau to share in. Children are encouraged to become independent learners capable of self care with support from adults. Children develop friendships with their peers as they play co-operatively and learn alongside others.

The physical environment is well organised and there are a variety of inviting learning spaces throughout the centre. These include an area for music and mat time, an enclosed family corner, a block area, play dough and puzzle tables and an area where a variety of art activities can be set up. The outdoor area has a number of attractive trees, a large sandpit and an area for climbing and setting up planks and other props. Water play, swings and carpentry are also provided.

Data collection methods

Observation

Before the observations were carried out, a series of familiarisation visits were made to each centre. These visits offered opportunities for the teachers to ask questions, for the teachers and children to become familiar with my presence while

giving me an opportunity to gain an understanding of the routines and the learning environment. It also helped to offset the 'observer effect' which occurs when those being observed behave differently than how they would normally (Collins, 2006; Denscombe, 2007). The familiarisation visits were carried out over the week immediately before the observations began; this provided continuity for the children and teachers. A series of five two hour observations were conducted in each early childhood centre. The reason for this number of observations was manageability of the data, based on previous experiences of collecting this type of data (Smith, 2008).

Observation is an ideal method for gathering the rich data which was needed in order to build a detailed picture of each setting. The observations focused on the children, the teachers and the learning environment. The observations of the children's play recorded the collaborative interactions children had with their peers as well as instances of peer tutoring. Rather than focusing on individual children, the observations were based around groups of children. Sociocultural theory informed this practice of observing groups of children so that the dynamics of the learning process can be revealed (Edwards, 2009). A particular focus was on the language the children used and the way that they shared ideas and information with each other; including the peer tutoring strategies children adopted. The observations included informal conversations with some of the children as they played. In talking with the children, the aim was to gain their conception of the teaching and learning process. These conversations provided an insight into how children viewed the collaborative play they were engaged in. The importance of gaining the child's perspective is supported in the literature by Collins (2006) who views it as a critical part of research with children.

The role of the teachers in promoting and supporting children's efforts to collaborate with and tutor their peers was an important focus of the observations. The observations revealed how teachers promoted and supported opportunities for children to work together and how they promoted opportunities for peer tutoring. This included instances where teachers promoted opportunities for children to assist their younger peers or where they modelled specific peer tutoring strategies. The types of questions that the teachers asked the children and the suggestions they made were also noted.

Finally, the observations included notes about the physical environment. This helped to establish which features of the environment consistently supported children to work together collaboratively. The observations highlighted whether some learning areas supported collaborative play more than others. Those learning areas that offered opportunities for collaborative play and numerous problem-solving opportunities for children were sought out for observation opportunities; for example, the sandpit, the carpentry table, the block area, the collage table and the dramatic play area.

As much as possible, the role of the non-participant observer was adopted (Mutch, 2005) so that a true description of the children's and teacher's interactions with each other could be established. However, there were some instances where I became involved in the children's play due to the nature of the setting. In addition there were some instances when I needed to talk with some of the children to gain their perspective about working with their peers. Cohen, Manion and Morrison (2007) support this idea, noting that such immersion facilitates the generation of thick descriptions which lend themselves to a more accurate interpretation of events rather than relying on the researcher's own inferences. This approach was used where appropriate.

Interviewing

Interviews were conducted with two teachers at each early childhood centre. The reason for this number of interviews was manageability of the data. Again, this decision was based on previous experiences of collecting this type of data (Smith, 2008). Teachers who were actively involved with the children and who expressed an interest in the study were approached. Permission from the centre supervisors to approach the teachers was obtained. The purpose of the interviews was to explore the teachers' knowledge of what happens when children work together and to discuss relevant play episodes which were captured in the observations. This is supported by Scott and Usher (1999) who state that interviews are useful for illuminating issues identified in observations. The interviews were semi-structured and were based around open-ended questions. Semi-structured interviews have a series of key questions and these are followed in an open-ended manner (Mutch, 2005). A semi-structured approach allowed flexibility for the participants to provide in-depth responses. The interviews provided the teachers with an opportunity to discuss their knowledge and practices in relation to peer tutoring (See Appendix A for a copy of the interview protocol used).

Research journal

A research journal was kept during the data collection phase. This was used to record reflections on the observations, conversations with the children and the interviews as they took place. The journal provided a further audit trail that documented the critical reflection of the decisions made and the justifications for these; this is termed 'reflectivity' in the literature (Mutch, 2005, p. 157). In addition it added to the data gathering process, which in qualitative research aims to provide a rich description of the setting and the participants in that setting.

Analysis

A number of methods were used to analyse the data. The observations, research journal and the interviews were analysed using 'constant comparative analysis' (Mutch, 2005, p. 177). This type of analysis allows the emerging patterns and themes within the data to be identified and explained. This is appropriate in this study, as in analysing case study data the aim is to discover categories, themes and patterns; and these build a picture of what is significant within the setting and help to identify the logical relationships which exist. Different coloured highlighter pens were used to code the data into themes. Once the data was coded, each piece of data was cut up and glued onto sheets of A4 paper. The sheets of paper were organised into themes and sub themes. These patterns can then be used to support specific theoretical principles (Scott & Usher, 1999). The data collected in the observations and interviews was analysed for consistency with the research evidence outlined in the literature review.

Further analysis of the data was undertaken using Rogoff's (1998) three planes of analysis. These enabled an examination of the children's learning on different levels. This included a focus on the participation of individual children (the intrapersonal plane), a focus on the interaction between the child and others (the interpersonal plane) and a focus on the surrounding learning environment (the institutional plane). This analysis included the participation of the teachers across the three planes. Edwards (2009) and Robbins (2003) support the use of the planes of analysis as an effective means of capturing the interactions occurring between peers and between teachers and children.

As the research was conducted in two early childhood centres, there was also a comparative analysis across centres. This allowed common patterns to be identified

and compared. Denscombe (2007) supports these types of comparisons between cases as a means of strengthening the findings.

Ethical considerations

Denscombe (2007) identifies guiding principles for ethical educational research. These are firstly that the interest of the participants should be protected, secondly that researchers should avoid deception or misrepresentation and thirdly that participants should give informed consent. These principles were adopted in this study. In addition, the ethical decisions made in this study were guided by a focus on relationships. Great care was taken to establish trust and to ensure open, clear communication with the participants. Cullen, Hedges and Bone (2005, p. 2) term this a 'relationships perspective' and they emphasise its importance for small-scale qualitative studies.

During the initial stage of setting up the study, an ethics application was submitted to the Massey University Human Ethics committee and permission to carry out the research was subsequently granted (see Appendix B). Careful consideration was given to the inherent value of the study for each early childhood centre. An initial letter of invitation was sent to each centre so that teachers did not feel pressured to participate in the same way that they might if a phone call was the initial means of contact (see Appendix C). It was important to select centres whose teaching philosophies and practices embraced opportunities for peer learning in order for the study to make a worthwhile contribution to the centres themselves.

As this study involved young children, there were particular considerations which needed to be adhered to. As the children being observed were under the age of five, parental permission was sought. When observing the children, ongoing assent was sought and any questions which the children had were fully answered. Any

unwillingness to be observed was respected. Sensitivity to the needs of young children was a priority, for example privacy and fatigue (Cullen, Hedges & Bone, 2005). In primarily taking the role of a non-participant observer (Mutch, 2005) it was not apparent to the children not being observed that they were not part of the research.

At the beginning of the data collection process, an initial presentation of the research aims and questions was made to the teachers. As discussed, each centre was visited at least twice prior to the observations in order to get to know the teachers and the children. This provided opportunities for the teachers and children to ask questions and for them to become familiar with my presence. This aspect of the data collection stage was not rushed and any request for further information was given attention. A detailed information sheet and consent form was provided to all teachers and parents (see Appendices D, E, F and G). These contained the intentions of the research study as well as information regarding how the data would be stored in order to preserve confidentiality. Detailed contact information was also provided. Pseudonyms were used for each early childhood centre and for the teachers and children involved.

In order to establish that the data was trustworthy and credible, full notes of all aspects of the study were recorded. Every effort was made to ensure trust in the processes that occurred. Mutch (2005, p. 114) defines trustworthiness to mean that "you have clearly demonstrated the research decisions, research design, data-gathering and data-analysis techniques and demonstrated an ethical approach". This criteria was adhered to in the documentation process with the research journal detailing the decisions throughout the data collection stage. After the observations and interviews were completed, a reporting back session was undertaken with each centre. At centre A the teachers requested a written summary, which was provided.

At centre B, a summary of the findings was shared at a staff meeting and this allowed the teachers to have an opportunity to examine the data before it was finally written up. The interview transcripts were returned to each participant and they were invited to comment on these. Three of the teachers elaborated on their interview scripts in writing, confirming what they had said. This ensured credibility of the data and Mutch (2005, p. 115) refers to this process as 'member checking'. In sharing a copy of the data and inviting comment, the construct validity of the research is enhanced and if participants have different perspectives of the data then these can be represented in the final report (Yin, 2003).

Conclusion

The methodological considerations outlined here justify and demonstrate the tools that were employed to carry out this study. As this study involved young children, careful consideration was given to ethical issues and the importance of building relationships based on trust with the teachers and children in each early childhood centre. The case study approach was the ideal choice for this study as it allowed an in depth examination of the dynamics of peer learning in a play based learning environment.

The results from each centre are presented in the following two chapters. Each set of results was analysed by identifying the major themes as they emerged from within the data. In presenting the results as two sets of data it is possible to compare and contrast the different peer experiences that children had across the two early childhood centres.

Chapter four

Results Centre A

Introduction

This chapter presents the research findings from Centre A. The first section outlines the observations of the children, including the conversations which occurred with the children as they played. Included within this chapter are reflections from the research journal. The second half of this chapter presents an analysis of the interviews with the teachers.

As explained in chapter three, constant comparative analysis (LeCompte & Preissle, 1993) was used to identify the emerging themes from within the data. As the themes became apparent they were coded and then sorted into groups. In presenting the results, the following coding system was used to organise the data: RJ=research journal, Ob=observation notes. The first initial of each teacher's name, in this case, E or R, was used when presenting the interview data; note that pseudonyms have been used. The numbers following each code refer firstly to page numbers and secondly to the line numbers on that particular page within the research journal and observation notes. The following discussion is organised around the recurring themes from within the data.

Observations and conversations with the children

The aim of the observations was to capture peer learning as it occurred in this early childhood centre. The emphasis on child initiated play resulted in the identification of many instances of peer learning. The conversations with the children occurred as

they played and these related closely to what the children were doing. The aim of these questions was to ensure that the children's perspective was included in the data. The presentation of the observations and conversations is based around five main themes. Children consistently shared their expertise and knowledge with their peers and examples that identify specific strategies which the children adopted are presented and summarised here. The role of language became a recurring theme and this was closely connected with children's actions and their expression of collective ownership of their play. The discussion then moves on to the roles which children adopted with their peers. This section includes the children's perspective of their role in teaching their peers. Negotiation and problem solving were frequently highlighted in the data and some examples are discussed which illustrate the significance of these skills in supporting peer learning. Finally, the role of the environment in promoting and supporting peer learning is discussed.

Children sharing their expertise and knowledge with their peers

A consistent theme within the data was instances where older children would assist their younger peers with tasks that the younger children were finding difficult. These instances occurred spontaneously and the data revealed many examples of these. Older children would often assist their younger peers at morning tea or lunch time. For example, on one occasion a child helped his friend take the wrapper off his muesli bar and on another an older boy helped a younger boy put the lid back on his lunchbox. In the following example, Lily (the older child) uses praise to encourage her friend Tammy to complete a puzzle:

Lily and Tammy were doing a puzzle together and Lily took on a leadership role, encouraging Tammy when they got the right piece in the right place. "That's right, now the next one" said Lily as Tammy successfully placed a piece into the puzzle. Lily also offered to help Tammy, with the two girls physically putting a piece in together. The two girls then

clapped when the puzzle was completed – the clapping was initiated by Lily. (RJ, p. 1, 20-23).

This example is significant because it shows Lily using a variety of strategies to assist Tammy. She uses praise to reinforce Tammy when she puts the piece in the right place, to encourage her to persist with the task and in response to the successful completion of the puzzle. Lily also scaffolds Tammy when she needs help to actually place the piece into the puzzle; this demonstrates Lily's ability to adjust the level of support that she gives Tammy in order for her to be successful. Completing the puzzle provides Lily and Tammy with a shared purpose which allows Lily to successfully scaffold Tammy. The strategies demonstrated here are essential components of the peer tutoring process.

There were different opportunities in the centre for the children to construct buildings and vehicles with material such as 'trio' (plastic blocks), wooden blocks and a train set. The construction areas in this centre were frequented regularly by groups of children, and these areas provided many opportunities for peer tutoring. The data showed many examples of older children assisting their peers to create vehicles, roads and buildings. In the example below, two boys spent a considerable part of the morning making train tracks together. Robert and Daniel worked closely together with Robert showing Daniel how to shunt his train.

Daniel and Robert (two older boys) are creating a train track with a bridge, they are playing together happily. "Hey this could be a side track" says Robert. "Yeah that's a good idea, look at this" says Daniel, showing him a piece of track. "You're not supposed to crash into it" says Robert as Daniel knocks into the bridge. The two boys work together to make the track, helping each other put the pieces together. "I'll show you what to do" says Robert as he shows Daniel how to make the train go over the track. "Now you shunt it Daniel, that's how you do it" says Robert as he demonstrates this to Daniel. Daniel begins to shunt his train and together they move their trains around the track they have built. (Ob, p. 7-8, 17-25).

In this example, Robert is playing an important role as a peer tutor. He adopts several strategies in the tutoring role. Initially he suggests creating a side track off the bridge; an idea that is accepted by Daniel. He then establishes the rule of not crashing into the bridge and this resulted in the play continuing with the boys collaborating together to construct the track. Robert then shares his expertise by showing Daniel how to drive the train over the track and how to shunt his train which Daniel goes on to do. In this play episode Daniel has learnt a new skill and this has come about as the result of Robert sharing his knowledge of trains. The emphasis on child initiated play in this centre and the time that was allowed for this, resulted in many opportunities for the children to share their knowledge and expertise with their peers as the examples discussed above have shown.

Collective language and actions

The data revealed that the children consistently used language and action to express their sense of togetherness with their peers during play. Many examples showed the children using language creatively and playfully; humour was also a significant feature. In the following example which took place in the sandpit, Marie and Jamie use language to express the collaborative nature of their play.

I notice Marie and Jamie who are playing together, spooning sand into a bucket. The girls start to stir the water in the bucket. "Let's make mud pies" suggests Marie to Jamie. "Yeah" says Jamie. "We need some cookies, we need some milkshakes, we need some mud pies, we need some caterpillars" says Marie. "We don't need caterpillars" laughs Jamie; they both laugh together. They begin to chant together, "we need sprinkles, we need white chocolate, we need milkshakes, we need some more sugar". They add sticks to the bucket, stirring them and the sand as they chant together, over and over – "we need chocolate, we need sprinkles". (Ob, p. 5, 25-31).

The language used here was central to the play that the girls were engaged in. They used language as a tool to express their learning and to think collectively about what they were doing. Language assisted Marie and Jamie to reach their goal of making mud pies.

In addition to expressing togetherness through language, the data revealed the extent to which children imitate the actions of their peers. One example was a group of children stomping in puddles they had created in the sandpit together. Another example was a group of children slapping bubble blowers on the table together, chanting *'it's raining, it's raining'* (RJ, p. 10). In another example, the children copy their peers as they make skateboards out of wooden planks. In this next observation, two girls are creating a river in the sandpit and one of the girls consistently imitates her peer in order to sustain her presence in the game.

Gina comes over with another full bucket of water which she tips into the river. Jasmine also collects some water in a bucket and adds this to the river. "I'm going to be a real ballerina" says Gina. "Me too" says Jasmine. Gina adds pieces of wood to a bucket she has found, "I've got a candle" says Gina. "Wow you've got a cake, whose birthday is it?" asks Jasmine. "Yours" replies Gina. "This is my fairy cake, mine's so dripping" says Gina. "Mine's so dripping as well" says Jasmine as she adds sticks to the bucket. "You know I'm going swimming tonight" says Gina, "me too" says Jasmine. "And you know you can be a real ballerina when you grow up" says Gina, "me too" says Jasmine. "I'm making a carrot cake" says Gina, "me too" says Jasmine. "Yah, someone's getting us some water" says Gina as another girl appears with more water for the river. "Yah" says Jasmine. "I'm taking my shoes off" says Gina, "me too" says Jasmine. (Ob, p. 4, 3-16).

This example is significant because imitation is a key strategy that children use to remain in the play with their peers. Jasmine watched Gina closely in this game and was quick to copy her actions and words. Jasmine recognised that Gina was taking the lead in the game and she wanted to be involved in this. The examples discussed

above demonstrate that language and joint action both played an important role in supporting and sustaining group play.

Talking with the children

Conversations with the children consistently revealed an awareness of the teaching roles they adopt with their peers in play. The children confidently expressed their expertise in relation to their peers and often this was expressed as *'I'm bigger and I know more'*. The example below focuses on two boys who spend a lot of time together at the centre and I take the opportunity to ask them about this when they are building with the construction sticks.

I ask "do you boys like playing together?" they both nod and Dion says "yeah, we're friends". "Do you show each other how to do stuff?" I ask. "No" says Dion, "just me show him" pointing to Kelvin, "cause I know lots". Kelvin doesn't seem bothered by this statement from Dion. They continue to play with their construction figures, "we're brothers" says Kelvin as he holds up his figure, "yeah brothers" says Dion. "I help him climb up the ladder" says Kelvin and "I show Kelvin la la la" says Dion, they both laugh. "We always play mobilo and trio" says Dion. "We always want to be builders together, we play Ben ten together and I've got a video and a tv and a play station" says Dion. The boys move away and so I move on after Dion has demonstrated that "I am clever, I can hop." (Ob, p. 27, 25-30, p. 28, 1-5).

Dion expresses his expertise here when he says that he 'knows lots' and he clearly articulates how he helps his friend Kelvin. Dion expresses the collaborative nature of their friendship and accepts that Kelvin has particular skills and knowledge which he can learn from. This data is important because it demonstrates that children have clear conceptions of teaching and learning as well as their ability to see their peers as sources of knowledge. The examples presented in this section highlight the children's awareness of their role as peer tutors.

Negotiation and problem solving

The data identified children's consistent efforts to negotiate with their peers. This negotiation included roles within dramatic play, sharing and distribution of props and turn taking. The children often problem solved as they shared their knowledge and ideas with each other. Inevitably, disagreements would occur, however the data showed evidence that the children were able to overcome conflict on a number of occasions. In the following example, a group of boys successfully initiate collaborative play and negotiate with each other as they make decisions together.

I go to the block corner where there is a group of children building a road. Patrick gets a car for another child out of the tunnel (the car is stuck). "I'll get it for you". Paul comes over to join in the game "heh, I'm ready to play with you guys". The other boys move over and Paul is accepted into the play. "Does this go here?" asks Matthew, "yip, now we have to put this here", says Patrick as he places another block on top of the building. "That's it" says Patrick. The plastic vehicles have now found homes inside the wooden roads. "Oh no, oh no" says Paul as his vehicle comes apart." Patrick helps him put it back together and then says "we need to roll this along here." "Ok I'll help" says Paul. "Now it's my turn" says Callum who wants to move his vehicle along the road. The boys decide to make another road to accommodate the number of vehicles that are now part of the game. "I'm making a house for you so you can park your vehicle here" says Patrick. "Ok, I'll park my truck with yours" says Matthew as he puts his vehicle in the parking spot Patrick has made. (Ob, p. 1, 11-24).

This data is significant because it identifies a number of key strategies which children use to sustain collaborative endeavour. The example shows Paul successfully entering play; his acceptance into the game is a result of his friendship with Patrick. The boys have a shared purpose which in this case is the construction of a road and buildings for their vehicles. Problem solving occurs as they put pieces of road together and Patrick rescues one of the cars which gets stuck in a tunnel. Being able to successfully negotiate where the wooden tracks go and making

decisions together result in the play developing into a complex game which carried on throughout the morning.

The data identified some instances where the teachers played a critical role in modelling turn taking, group entry, negotiation and problem solving. Their role included extending the children's collaborative play by introducing new language and asking open questions; supporting children to successfully navigate their way through conflict was also evident. The following example reveals the importance of the teacher's involvement.

Lee has joined in with the trains with Danny and Robert, he seems determined to disrupt the play. Emma (teacher) says "Why don't you bring the road pieces over here and you can build a road to drive your truck along, I will help you if you like" says Emma. Lee begins to build a road with Emma. Cameron has come over to join Lee and Emma who are making the road. Emma helps Cameron to join in: "you might need to ask Lee if you can join in and drive your truck on the road; use your words." So Cameron asks Lee if he can join in and Lee says yes. Emma asks the children how they can make more space – "what's happening to your road, its breaking. What do you think the problem is?" asks Emma. Emma points out the uneven carpet and so the children help her to move the track. Cameron and Lee start to collaborate – "come on Cameron, we need this piece" says Lee. "Ok" says Cameron and he adds the next piece of the track. The boys start to race the cars. Lee doesn't want to let Cameron drive his truck. "His truck is too big" says Lee. This leads to a discussion about the size of the trucks with Emma talking about width and the problem is solved, with the play continuing. (Ob, p. 14, 19-31).

Emma makes specific suggestions to help Lee and then Cameron gain entry into the play; with Cameron this involves modelling what he needs to say. She then identifies the problem with the uneven carpet and suggests a solution. Her skilful intervention and knowledge of the children result in Cameron and Lee beginning to work together. Emma responds to Lee's observation that Cameron's truck is too big by capitalising on this opportunity to extend the children's knowledge about width.

This example accentuates the role which teachers can adopt in order to support peer learning. The examples discussed in this section identify the importance of negotiation and problem solving skills for sustained collaborative play. Clearly the teacher has a role here in assisting children to develop these important skills.

The changing environment

The data provided evidence of the teachers adding different resources to the environment which resulted in the children taking on new roles, or developing new games. The addition of these resources supported opportunities for cooperative play. The data provided several examples of Rachel altering the learning environment after careful observation and in response to the children's current interests. These examples included the addition of taped music which resulted in a musical band forming and a car wash which was set up in response to an idea that one of the children had.

The centre had particular physical features which encouraged the children to initiate play with their peers. One example was the kai (food) tables which were set up in an enclosed area and were grouped together to encourage social interaction. The children were able to help themselves to food from their lunchboxes and go and sit at the kai tables whenever they wished. There were always children at these tables and this area provided opportunities for children to form friendships with their peers. Often after eating together, children would leave this area and go off to play together. The way the tables were set out and the rules around the use of this area was empowering for the children. The data identified many opportunities for relationship building, social skills and conversation; the area was a catalyst for fostering a sense of community amongst children and teachers.

One particular feature in the environment which the children were consistently attracted to was the tap which was situated at the edge of the sandpit; it featured frequently in the data.

I move over to the tap where Sophie, Nicky and Jamie are filling buckets. Nicky doesn't have one so Sophie tells her to go and get one. Jamie says "I don't know how to turn it down Nicky". "Like this" says Nicky and she shows Jamie which way to turn the tap to control the flow of water. (Ob, p. 4, 25-27).

Two girls are now working together to fill a container with water. One turns the tap while the other fills the cup. Caleb (a younger child) comes over "I need water" he says, "here" says Lily as she turns the tap on for him. (Ob, p. 14, 8-10).

These examples reveal how the tap provided many opportunities for peer tutoring with the older children often showing the younger ones how to control the flow of water and how to turn the tap on. The second example also shows co-operation between Lily and Caleb as they fill their containers. The tap became a point of negotiation amongst the children as they took turns filling up buckets of water or washing their feet. It was very empowering for the children and they quickly became quite skilled at the mechanics of operating it. This tap is an important example of the role that the environment can play in supporting children's collaborative efforts. The data presented in this section highlights the need to consider how the learning environment impacts on opportunities for children to work with their peers.

Summary

The observations of the children have identified the different strategies that children use to learn with their peers. These strategies include negotiation, problem solving and sharing of their expertise. The data highlights the need for teachers to

understand the importance of their role in supporting children so that they can be effective peer tutors. This support ranges from modelling specific strategies to help children gain entry into play, to creating an environment that provides opportunities for children to socialise with their peers and empowers them to direct their play. In addition, the results have revealed that children have awareness of their knowledge and of their role as peer tutors.

Teacher interviews

Emma and Rachel from Centre A were interviewed after the observations had been completed. The aim of the interviews was to find out what they knew about peer learning and the impact this had on their practice. The interviews used a semi-structured approach with open ended questions (see Appendix A). Some of the questions related to the observation data and this approach gave both teachers an opportunity to discuss instances of their practice that had been recorded. The value of this type of elaboration is proposed by Denscombe (2007). The interview data was analysed using 'constant comparative analysis' (LeCompte & Preissle, 1993) and the discussion presented below is organised around the three main themes that came from that data. The interview data presented in this section will be compared with the observation data where relevant.

Both Emma and Rachel placed an emphasis on the benefits of peer collaboration and peer tutoring for children's learning, differentiating between the learning that occurred during the centre routines and during child initiated play. Secondly, it became apparent how much their own beliefs and philosophy influenced their practice in this area of learning. Finally, the teachers outlined how they promoted opportunities for children to learn from their peers and this data revealed similarities and differences in the approaches they adopted.

Benefits of peer learning

When asked how they would define the terms 'peer tutoring' and 'peer collaboration', both teachers said that they had different meanings. Peer collaboration was defined as children working together and sharing ideas; peer tutoring was seen as a child, often an older child, helping another child to learn by teaching them something new. The teachers' differentiation between these terms is important because it acknowledges their understanding that peer tutoring is more than children working together, it is children helping their peers to extend their knowledge.

Both teachers described the benefits of children working with their peers. These included developing their social and language skills, problem solving, sharing ideas and forming relationships with other children. The social benefits identified here assist children to establish intersubjectivity which the teachers identified is necessary if children are to effectively tutor their peers. Once intersubjectivity is achieved, it is possible for children to scaffold their peers to reach new understandings.

Children learn through copying, conversing with and sharing ideas and experiences. They learn through scaffolding each other and working in their 'zone of proximal development' at their level, like at the child's level from each other. (E, p. 1, 3-5)

This data highlights the collaborative nature of cognition and the teachers' perceptions of the central role that the zone of proximal development plays in recognising the potential for new learning to occur when children work together. Equally important is the scaffolding process in which more capable children are perceived to support their peers to achieve success within their zone of proximal development. The data discussed in this section shows that the teachers

acknowledge the role that children can play in extending their peer's knowledge and the specific benefits which are experienced when children work with their peers.

The role of routines and grouping children

A recurring theme throughout the interviews was the different opportunities that child initiated play and routine times held for peer learning. Both teachers strongly advocated for child initiated play in a mixed age setting. Rachel and Emma identified child initiated play as providing opportunities for children to build relationships as they have a wide group of children to interact with as they move freely from one activity to another. Increased opportunities for turn taking, negotiating and peer tutoring were also identified as benefits. Both teachers emphasised the importance of children experiencing long periods of uninterrupted child initiated play in order for sustained collaborative endeavour to occur. Rachel stated her views on this quite passionately:

Children are able to complete their project they have started without routines being a priority. Many a time a child had started an activity and it's a routine that takes that away. I've seen so many times where children's activity has actually been packed away because the routines take priority. There's nothing worse, or its time to pack up and they haven't actually finished or completed. (R, p. 1, 32-33, p. 2, 4-5)

The data outlined in this section has highlighted the need for teachers to consider the role of routines in promoting opportunities for sustained collaborative play. In addition, the importance of a mixed age setting has been recognised for offering children opportunities to tutor their peers.

Philosophy and beliefs

It became evident when talking with the teachers that their personal teaching philosophy impacted on how they promoted opportunities for peer learning. For

example, Emma believed that the teacher has an important role in sustaining group play and she stated that often she would use language to interpret children's play:

Being there to extend them by talking so that they can reflect on the knowledge that they have and bring it into their play. It's seeing what they're into and if you can see that they're really into it extend them with the language and the experiences or the knowledge that they might have just to draw it out (E, p. 6, 9-10).

This response highlights the importance of the teacher's role in supporting children's use of language as it is through the use of dialogue that children construct meaning and extend their learning. Language was also identified in the observations as an important tool for expressing children's collective activity.

Rachel would often be very playful with the children when they were working together, for example zooming around on the bikes with the children, splashing them with water. Her enthusiasm and sense of fun with the children was exciting to observe. Rachel spoke passionately in response to questions about these observations of her practice.

Children need to see that adults can get down to their level and play with them. But they also need to know that there is a line when it comes to that. And I've found in all my time in early childhood I've played, I've chased, I've run. And yet when I can say to that child 'hokey pokey you need to go inside', I get the response straight away. They can see the even balance. (R, p. 8, 22-27).

This response is significant because it reveals Rachel's belief in the importance of responding spontaneously to children's play. This spontaneous approach was empowering for the children as it encouraged them to play in a different way. The importance of providing an empowering environment for children was also revealed in the observation data. This data showed that an empowering environment

supports children's collaborative efforts and allows them to be in charge of their learning.

When asked how Te Whāriki (Ministry of Education, 1996) influenced their role in children's learning, both teachers saw it as providing guidelines for practice; however they found it difficult to express exactly what it offered in terms of specific suggestions for practice. Emma expressed this difficulty:

There's lots of things in there like extending their language and knowledge about different things, encouraging children to play together, encouraging children's belonging like being part of a group playing and problem solving, there's heaps of different things going on. I think it's a good overview, but it's like you need to think how can I sort of use it, um its hard. (E, p. 8, 13-16).

Rather than taking her cues from the document itself, Rachel relied on her own knowledge and experience to guide her involvement in children's play.

I think that comes from experience doesn't it, knowing when as the teacher you're in the play. I feel, I know the need, when I need to step back, when to get involved, when to teach, ok? (R, p. 11, 26-28).

These responses reveal the uncertainty that teachers can experience when working with a curriculum document that requires teachers to interpret their role within the setting in which they are working. Both Rachel and Emma acknowledged the freedom that Te Whāriki offers, but also expressed the role of experience in knowing how to best extend children's learning. The results discussed in this section identify the impact that teachers' beliefs have on the way they foster collaborative endeavour. In addition, the results reveal that the interpretive nature of Te Whāriki leaves teachers to define their role and that this is a complex task.

Promoting peer learning

Knowing children well was identified as being important when the teachers were making decisions about whether they would get involved in supporting children's play. This was of particular importance when conflict between the children occurred. Both teachers acknowledged that they felt it was important for children to resolve their own conflicts but that they would assist them depending on who the particular children were. This could mean modelling appropriate language, sharing and turn taking or perhaps assisting a child to negotiate entry into play. Emma talked about how she observed the conflict unfolding before deciding whether to get involved.

*I think it's important that they resolve their own conflicts, however if I can see a child for example ***, like if he hasn't got the language to do it, I will jump in. I will help because obviously if you've got a bigger child who has got the words and he hasn't then something might happen, that's not so good so that is where you need to be there to jump in and support the children. (E, p. 2, 25-28).*

Rachel felt that often teachers are too quick to step in and that this doesn't allow children the opportunity to learn an important skill. Emma supported this, identifying problem solving and negotiation as skills that children develop when adults do not intervene in play. These responses are significant because they emphasise the importance of creating opportunities for children to actively exchange different ideas and viewpoints in order to develop shared understandings. Providing opportunities for cognitive conflict can result in children developing new understandings as they restructure their thinking. The observation data supports this assertion as this data identified negotiation and problem solving as important strategies which the children used to successfully develop their collaborative play.

The teachers identified a range of strategies which they use to promote peer learning. Their responses to this question reflected their practice which was captured in the observations. Emma consistently extended children's play with new ideas and language. She identified language as being critical to collaborative play and peer tutoring, stating that children needed to be skilled with language before they could successfully scaffold their peers. Emma also emphasised the importance of using language to model scaffolding and specific phrases to ensure children became skilled at group entry, turn taking and sharing; these were identified as being critical skills for sustained collaborative play.

Rachel often set up activities or added resources to the learning environment that resulted in the children playing for extended periods of time in a very involved way. She talked about the importance of adding different props, but emphasised that this was always after careful observation of the children's play. These responses reveal the careful thought that Rachel gave to the role of the environment in promoting collaborative play. In creating enclosed spaces with props that supported the children's interests, Rachel provided opportunities for the children to explore and negotiate with their peers through role play.

Both of the teachers commented that enclosed spaces frequently promoted sustained group play. The observation data supports this as it demonstrated the use of the kai tables which were positioned in an enclosed space away from the traffic areas. This area provided important opportunities for children to socialise with their peers and to establish friendships which then led into group play. Rachel suggested that children like enclosed spaces because it gives them privacy away from adults to carry on with their play in an uninterrupted manner. Her belief in this was reflected in the way she consistently extended children's collaborative play by changing the environment to build on the children's developing ideas; for example one morning

she constructed a house under the fort outside. This led to sustained play as a families game developed over the course of the morning.

The data presented in this section identifies a range of ways that the teachers promote peer learning, reinforcing the critical role of the teacher in supporting opportunities for children to work with their peers. Emma consistently used language to support children's collaborative endeavour whereas Rachel altered the learning environment in response to children's ideas and interests.

Summary

The interviews with the teachers have extended the observation data and revealed connections between professional knowledge and practice. The teachers acknowledged the important role that peers play in children's learning, advocating regular opportunities for sustained, child initiated play. The teachers' beliefs about their role in children's learning were reflected closely in their practice which identified a number of different approaches to supporting peer learning.

Conclusion

The observations found that the children consistently shared their knowledge and expertise with their peers in spontaneous play and they used a variety of strategies to do so. Language was identified as being an important means of expressing togetherness in play and the children used language creatively to extend their play. Conversations with the children revealed their ability to express their expertise and showed an awareness of their knowledge. The environment was found to play an important role in promoting collaborative endeavour. This included the teacher's use of resources in response to children's interests and ideas.

The teacher interviews provided further evidence which supported the observations and revealed the teacher's knowledge of peer learning and how this is incorporated into practice. The teachers clearly stated how children benefit from learning with their peers and they differentiated between peer collaboration and peer tutoring by acknowledging the teaching role that children sometimes adopt with their peers. Both teachers expressed the importance of opportunities for child initiated play in mixed age settings. The interviews revealed connections between the teacher's beliefs about how children learn and the way the teachers interact with children to support peer learning. Finally, the teachers identified the teaching strategies they use to promote peer learning which impact significantly on the quality of the experiences that children have at this early childhood centre.

The next chapter presents the findings from centre B. These findings reveal some consistencies with the results from centre A; however there are also a number of differences within the data. These similarities and differences will be discussed further in Chapter Six.

Chapter five

Results Centre B

Introduction

This chapter presents the results from Centre B, beginning with the observations of the children. This is followed by the conversations which occurred with the children as they played, including reflections from the research journal which was kept throughout the data collection phase of the study. The second half of the discussion presents the interviews with the teachers.

Constant comparative analysis (LeCompte & Preissle, 1993) was used to identify the emerging themes from within the data which were coded and then sorted into groups. In presenting the results, the following coding system was used to organise the data: RJ=research journal, Ob=observation notes. The first initial of each teacher's name, in this case, B or C, was used when presenting the interview data; note that pseudonyms have been used. The numbers following each code refer firstly to page numbers and secondly to the line numbers on that particular page within the research journal and observation notes. The following discussion is organised around the recurring themes from within the data.

Observations and conversations with the children

As discussed in chapter four, the aim of the observations in each case study was to capture peer learning as it occurred in the early childhood centre. The conversations with the children endeavoured to explore their perspectives of peer learning. The centre routines were found to both support and impact on opportunities for children to learn from their peers; the way the routines operated in this centre formed an

important part of the data collected. The observations identified a number of strategies that the children used as they worked with their peers. Strategies used included sharing their knowledge and negotiation, in which language played an important role. A key theme that emerged from the data was the awareness that the older children had of their skills and knowledge; their younger peers perceived them as sources of knowledge. Finally, the observations showed that the teachers used a variety of strategies to support peer learning and these are outlined here.

The role of routines

From the first day of the observations, it was evident that the centre operated with consistent routines in place. The observations took place in the morning and during this period of time, the children had a short mat time, morning tea, then time for child initiated play before the bell was rung for all of the children to come inside for lunch. The children were aged from two years to nearly five and for both mat time and morning tea time, the children were grouped with their peers of a similar age, limiting opportunities for the younger and older children to interact. This was the regular pattern, however when the numbers of children attending were low, the children were all grouped together for mat time and morning tea.

Data collected revealed four examples of the lunch bell interrupting children when they were engaged in meaningful play with their peers. These examples included a group of boys playing a cooking game in the sandpit, a group of girls playing a babies game in the family corner, a music game which a group of children had initiated, and two boys who had been working together building a house at the carpentry table. The following example involves the two boys at the carpentry table.

Beverley comes over to the table and gives the boys a two minute warning for lunch. Harry responds by saying to Martin "oh no, so we need to build our pretend house quickly". They

keep sawing and Mark and Ollie are busy hammering alongside them. The bell rings and Harry and Martin reluctantly down tools. (Ob, p. 6, 21-24).

Clearly the boys were not ready to move on from their construction and the lunch routine meant that they were rushed and couldn't finish what they had started. This example demonstrates what happens when routines do not support learning that children have initiated. Other examples highlighted five occasions when children were taken to the toilet by the teachers when they were involved in group play. On one occasion this impacted on the imaginary game two children had initiated, with the remaining child moving away to play with another child. On another occasion, three children were building a castle with the blocks and one child had worked very hard to gain entry into the play. He had just been successful and was beginning to join in when the teacher came over and suggested he needed to go to the toilet. In both examples, this intervention by the teacher effectively changed the direction of the play.

However, the data also provided some evidence of the routines supporting opportunities for peer tutoring during the morning mat times. One example evident in the observations was the request from teachers for children to stand up in front of their peers and say the karakia kai (a prayer said to bless the food before eating it together) before morning tea. This occurred consistently every morning, and it provided opportunities for children to contribute as role models for their peers and to be recognised for this. After the karakia kai, the teacher asked the children to choose a friend to take to the bathroom to wash their hands. On the occasions when the children were all grouped together for mat time, the teachers paired the older children up with their younger peers. The older children enjoyed this responsibility. The children each had their own placemat and on several occasions, the older children were seen helping the younger ones who couldn't find where they

were supposed to be sitting. These examples show the potential for peer tutoring within this routine, particularly when the children are all grouped together.

The data in this section has demonstrated the impact of routines and grouping on peer learning. The evidence reveals that the routines inhibit and to a lesser extent enhance peer learning. Some opportunities for peer tutoring occurred during the morning mat time however the routines were found to also have a negative impact on children's agency. Grouping children with similar age peers and interrupting play to ensure routines were met removed important opportunities for peer learning.

Children's strategies

The observations produced many examples of brief moments when the older children would adopt a helping role with their younger peers. However, due to the nature of the centre routines, the data produced only three examples of sustained play where children were actively exchanging their ideas and sharing their expertise with one child adopting the role of the peer tutor. In one episode, a group of children initiated a music time in the mat area. Melanie (one of the older girls) adopted a teaching role, taking the younger children to wash their hands after they had said the karakia kai. She then rang a music bell, telling all the children to come to lunch. In the following example, a group of girls are playing mums in the family corner:

Melanie enters the game with two pretend phones in her hand (these are constructed from mobilo). She gives one to Amy (younger child), telling her "here, you've got to have a phone to text on". "But I can't text" says Amy. "Ok, I'll show you then" says Melanie. She proceeds to explain what the buttons are for and tells Amy how to text her Mum. "I need to text April" says Melanie as she presses the buttons on her phone. Meanwhile Amy is busy texting, giggling to herself as she presses the buttons. (Ob, p. 13, 30-33, p. 14, 1-3).

Melanie supports Amy to successfully text and extends her knowledge about mobile phones in the process. Melanie gave Amy clear verbal instructions as she explained the process of how to text; language played a key role here. In the following example, two boys worked together at the carpentry table; the older boy showed his friend how to use the saw and vice successfully.

Two boys are at the carpentry table, they work together sawing –Cameron has a carpentry apron on. “Can you help me?” asks Matthew to Cameron. “Yeah” says Cameron. “You get your saw and then use it like this” says Cameron as he demonstrates a smooth sawing action to Matthew. Matthew tries this and begins to successfully saw his piece of wood. Shaun comes over and puts his wood in the vice but it moves and he can’t saw it. Cameron notices that he is having difficulty and says “No, you need to tighten it like this.” He tightens the vice for Shaun who then begins to saw. (Ob, p. 16, 1-8).

This example identifies Cameron as a peer tutor who teaches Matthew and Shaun some new skills. Matthew sees Cameron as being skilled with the carpentry equipment and Cameron readily responds to Matthew’s request for help and then notices that Shaun also needs assistance. By working within their zone of proximal development, and adjusting his response to each peer, Cameron is able to successfully scaffold his peers and they accomplish the task with his help.

The data revealed many examples of the children consistently using negotiation to work collaboratively with their peers. Most of these play episodes took place in the block area, the sandpit, the family corner and included one example at the dough table. The children were consistently involved in role play and, in the sandpit game, language was an important means of expressing the children’s ideas as they ‘cooked’ with a large wok, some buckets, scoops and spoons. The example outlined here identifies a pattern of negotiation in a ‘families game’; once again the children

used language to identify their roles and express their thinking as the game developed.

"Can I hold the baby?" asks Daniel. Ashleigh gives Daniel the baby. Daniel, Ashleigh and Glenn sit together near the climbing area. Max appears and says "hi, I was late". He immediately enters the game as Glenn moves over to make room for him. Max asks Glenn if he wants to go on the slide and they go off together. Daniel and Ashleigh decide to play a shopping game with the baby that Daniel is holding. Ashleigh holds the shopping list and Daniel puts the baby in the pram. Joanna comes over and asks Ashleigh if she wants to be the older sister, "but I'm the Mum" replies Ashleigh. "We can both be the Mum" suggests Joanna, Ashleigh agrees. Glenn reappears and there are four children now, they successfully negotiate props with Daniel pushing the baby in the pram. Glenn goes to get a book which he places on the pram, "Daniel we need a book for our shopping game", he agrees and Glenn has successfully re entered the game. Daniel tells me "we are getting some books in here for our baby, I'm the Dad and she's the Mum". (Ob, p. 21, 17-28).

This example demonstrates the role of negotiation in sustaining group play. The negotiation centres on the roles that the children adopt and the props that they are using. Glenn uses the suggestion of a book as a means of re-entering the game at one point. Negotiation was an important means of ensuring that the children collaborated successfully together, each child was intent on making the game work.

The examples discussed in this section highlight the children's use of their expertise and negotiating skills as important strategies in peer learning. However, the nature of the routines in this setting resulted in fewer examples of sustained episodes where children actively exchanged ideas and influenced their peer's learning.

Children's awareness of their knowledge

Eight examples were collected which demonstrated the older children's awareness of their knowledge. On three different occasions, the children clearly conveyed their perception of themselves as teachers; this was revealed in the conversations I had

with them. In the following example, Alice is involved in a mail delivery game in the family corner; I talk to her as she delivers some mail to me.

I notice Alice delivering the mail and after she has given me a letter, I tell her she is very clever. "I know how to do lots of things" she replies. I asked her who showed her and she responds with "I taught myself, I teach my little sister games, I teach her some writing, so she will know things". She's only one and she likes to come into my room". (Ob, p. 18, 17-20).

This example is significant because it shows that Alice perceives herself as having expertise which she can share with her sister. She understands that she can play an important role in ensuring that her younger sister learns skills such as writing. In another example, a group of children have initiated a mat time game and they are singing the karakia kai before organising some of the younger children to wash their hands before lunch. There are no teachers present and when I ask one of the girls about their game she states quite clearly and emphatically that *'we are the teachers'* (Ob, p. 19, 14), pointing to herself and her two friends. Once again these children were taking on a teaching role and the younger children that were part of this mat time session accepted this, responding in a way which suggested that they saw their older peers as teachers.

Three examples where the older children expressed concern for their younger peers were also identified. The supervisor and other teachers expressed their desire to create a family type atmosphere. Several siblings attended together and this combined with a smaller roll (the centre is licensed for thirty four children), fostered a sense of community which was most evident. On one occasion, an older boy comforted a younger child who was crying at the morning tea table and looking towards the door. Caleb told her that she would be okay and that her dad would be here soon. He expressed his empathy by rubbing her arm and reassuring her; after

a short while she stopped crying. The next example demonstrates the extent to which some of the older children felt a sense of responsibility towards their younger peers.

I had an interesting conversation with Amelia who is nearly five. She was helping Darryl down from a box and she hugged him afterwards. I asked her whether she liked to help the younger children and she said "I help look after the little children, cause I nearly a big school girl". "Wow" I said, "that's great". Amelia thought for a moment and then said "when I go to school, I won't be able to look after the little children then". She seemed quite concerned about this. (RJ, p. 3, 16-21).

In this example, it was noteworthy to see that Amelia was thinking ahead and expressing concern for the younger children after she had moved on to school.

The data discussed in the previous section shows that the older children have an awareness of their knowledge and empathy for their younger peers. This caring atmosphere was actively supported by the teachers who established a family type environment which encouraged the children to be nurturing and kind towards their peers.

Teachers supporting peer learning

Analysis of the observation data revealed that teachers in this centre supported peer learning in a variety of ways. Careful observation of the children's play followed by the addition of props to support their ideas was evident. In one example, Anne (one of the teachers) supported the children's efforts to build ramps for their vehicles in the climbing area outside by providing more planks to extend the ramps which the children had built between their construction boxes. In another example, the older children had initiated a music session which carried on over three consecutive days. Initially the children were dancing and singing to taped music. Kylie (another one of the teachers) extended this by introducing ribbons and

percussion instruments. This led to the children developing the music session as a mat time, with one of the children being the teacher in the big chair. The younger children observed their older peers intently and joined in by singing and playing the percussion instruments. The addition of props encouraged the children to further explore music and to direct their own learning with the older children adopting leadership roles.

The observations revealed three examples of teachers modelling language which resulted in sustained collaborative play; two of these examples occurred in the sandpit and one is outlined here.

Beverley (the teacher) helps Jasmine enter the play – “Use your words Jasmine, you have to tell him what it is you don’t like”. Jasmine explains to Brendan that she doesn’t like it when he won’t share and Brendan accepts this, moving over and giving her a bucket. “Kia ora, well done Jasmine” says Beverley. A dispute erupts between Peter and Andrew over repairing the digger. “Maybe you could fix the seat Peter and Andrew could fix something else” suggests Beverley. These suggestions help and the two boys discuss how to repair the digger. Meanwhile Jake and Ben cannot decide who should put the chocolate in the fridge which they have made. Jake begins to cry. “It’s ok, I’ll help you” says Beverley and she models, mediates and praises the two boys as they reach an agreement to have turns. Beverley asks the two boys to ‘high five’ and then asks them “are you playing together well now like best buddies?” “Yeah” they say together and they continue to play successfully together for some time. (Ob, p. 23, 1-12).

Beverley's presence and involvement in the sandpit resulted in the play continuing for some time. Initially the play seemed tenuous; however through suggesting solutions and supporting the children's ideas, Beverley ensured that the children could continue to participate in meaningful play with each other. The data discussed in this section has revealed that the teacher's presence can have a positive impact on peer learning in a number of ways.

Summary

The observation data that has been presented here reveals the negative impact of the centre routines and the grouping of children on opportunities for sustained, uninterrupted play and tuakana teina; this was despite the brief opportunities for peer tutoring within the morning mat time. The observations identified how the children shared their expertise with their peers and how they consistently negotiated on a number of levels as they worked together; language was an important tool. The children demonstrated clear perceptions of themselves as teachers in addition to displaying empathy for their younger peers. Finally, it is evident that teachers have a critical part to play in nurturing peer learning.

Teacher interviews

Caitlin and Beverley from Centre B were interviewed after the observations had been completed. The aim of the interviews was to find out what they knew about peer learning and the impact this had on their practice. A semi structured approach was taken as some of the questions related to the observation data and this gave both teachers an opportunity to discuss instances of their practice that had been recorded. The interview data was analysed using 'constant comparative analysis' (LeCompte & Preissle, 1993). A strong theme in the interview data was the consistent reference made by both teachers to how children learn from their peers; specific examples were given to support these points. Both teachers emphasised the important aspects of their role in peer learning and this included reference to Te Whāriki (Ministry of Education, 1996). Finally, the data revealed the teacher's understandings about the role of routines and child initiated play in supporting peer learning.

How children learn from their peers

When asked how they would define peer tutoring and peer collaboration, both teachers defined the two terms differently. Peer tutoring was defined by Beverley as

When one child is helping another, it's like the tuakana teina relationship (B, p. 1, 20-21).

Caitlin's response supported the idea of helping and she suggested that children are sharing something that they are confident with when they are tutoring their peers. Both of these responses point to the teaching role which one child adopts, often this is the older child. Collaboration was defined by Beverley as:

*Children working together, like team work, working together on a common goal.
Collaboration it's just getting stuck in and doing something together because they've got a common interest and something they both desire that they really want to do (B, p. 2, 5-7).*

Both teachers recognised that both peer tutoring and peer collaboration could occur in the same play episode, but that peer tutoring involved one child having some extra knowledge or skill to share or pass on. These responses accentuate the important difference in meaning between these terms. This difference recognises that when children are peer tutors, they have different levels of competence which they share with their peers and this results in knowledge being passed on.

Imitation and observation were consistently identified as important means by which children learn from their peers; specifically younger children observing and imitating their older peers. Beverley expressed the idea that younger children often desire to do what the older children are doing as this is one way they develop confidence. Caitlin identified observation as being an important means by which children learn particular phrases which allow them to successfully enter play:

cause they're listening as well as watching, like they're listening to the talk and then it's when you start hearing some of the little ones that have been watching, they start trying to do that

group entry and trying to use the words they've heard the other kids use. 'can I help you, can I be the big sister or something', yeah (C, p. 4, 28-30, p. 5, 1- 2).

In the example above, Caitlin highlights language skills as being important if children wish to successfully join groups and get involved in play. This response is significant because it recognises that the ability to articulate the desire to join play is a necessary first step in collaborative endeavour.

Beverley stated that children learn to understand different points of view when they are working together.

The biggest thing I've noticed is children learn very quickly to try and understand other people's points of view and you hope that they can (laughs)... so it's kind of encouraging that socialising and that they have to learn to get on with other children. (B, p. 9, 18-20, p. 10, 6).

Beverley's recognition of the opportunities for children to understand different viewpoints is significant because the ability to see another child's perspective allows children to gain new understandings and it means they are open to exploring new ideas.

When asked whether they viewed scaffolding as a strategy that children use, both teachers said they had to think hard about this question. Beverley and Caitlin concluded that children do scaffold each other but that they had to really look to see this happening. Caitlin saw scaffolding occurring during table top time which takes place after lunch. During table top time, the teachers set up a number of organised activities such as board games for the children to participate in. Caitlin commented that if the children are playing games such as matching different objects then this can provide opportunities for the older children to scaffold the younger ones.

If there's a couple of new ones there that's when they go 'oh you need to put it in the thing to shake the dice' or they might say 'you've got to use that to put it on it, that goes with that,' or if they see the child's struggling to match something they'll go 'try this piece'. Some share how they have achieved what they have been doing and this peer experience is often more powerful – 'I did it like this', 'you have to put it in this way'. (C, p. 9, 5-10).

This example shows that teachers perceive that children can use language to break down a task into small steps so that their peer experiences success. Caitlin's comment that often the peer experience is more powerful (than if a teacher was involved) supports the need for opportunities for children to take charge and to adopt a teaching role. Beverley said that you don't necessarily expect children to scaffold each other but that after working in a Montessori centre where it occurs frequently, she notices it more than she used to, particularly if children are working in pairs. These responses were interesting because they indicate that the teachers were initially unsure as to whether the children scaffolded their peers and that they saw this strategy being used in more structured activities rather than child initiated play.

Both teachers identified the puzzle area as a place where children scaffold their peers. Caitlin gave an example of a child who knew exactly how much support to give to the younger children and he would adjust his responses accordingly. Beverley shared a similar example:

One of the girls said 'oh I've helped so and so do a puzzle and it's harder than the one she did yesterday'. So that child had obviously gone back and was being a bit of a nurturing buddy for that child and thought oh well you've done this one with me, we can try another one. She was conscious of that fact that the child could do that one, so let's try this one because I can do this one, maybe you can too. (B, p. 8, 8-12).

These examples demonstrate that the teachers perceive the older children to be sensitive to the needs of their peers and that they adjusted their responses

accordingly. In this example, the older child knew what the younger child was capable of and was presenting her peer with further challenges; this recognition is an important part of the peer tutoring process. This section of the discussion has identified a number of ways that teachers consider that children learn from their peers. The data shows that the teachers are aware that children can adopt a teaching role, sharing their knowledge and experiences with their peers.

The teacher's role in peer learning

The teachers described the centre as having a family orientated philosophy and this was supported in the observations. For example, the teachers actively encouraged the older children to look after their younger peers and this included showing them how to take part in different aspects of the centres programme. Both teachers talked about supporting peer tutoring by encouraging the older children to take the younger children to wash their hands before morning tea. Caitlin described what happens when children are asked to do this:

If the child's a bit lost and the big kids are keen, then they tell them how to turn the taps on and show them how to push the soap pump. Show them where the paper towels are, try to roll up the children's sleeves for them and dry their hands if the kids just standing there gobsmacked (laughs). (C, p. 5, 29-30, p. 6, 1-3).

This data is an example of the teachers deliberately pairing children to create an opportunity for peer tutoring. The teachers said that the children enjoyed this responsibility and that the younger children accepted their older peers in this teaching role.

Both teachers consistently reinforced role modelling as something they did to support children working together. The teachers modelled group entry, sharing and turn taking; knowing the children well was identified as impacting on how they went

about this. Caitlin and Beverley stated the importance of modelling specific phrases such as 'can I have a turn on the bike when you have finished please' or 'I don't like it when you...' rather than just saying 'use your kindness with that person please'. Beverley felt strongly that this support from the teacher needed to be specific and related to the particular context. These responses reveal the teachers' understandings about how they can best support the children to develop the necessary skills to sustain play with their peers.

A strong theme in the interview data was the need for children to be given the space to work through conflict with their peers; the children were seen as capable of negotiating with their peers to reach a shared understanding. Both teachers expressed the importance of observing first to decide whether intervention is required. Beverley stated this clearly:

Personally I think it's crucial to give children the space to try and resolve things on their own but you've got to be sensible about it. (B, p. 5, 4-5).

Caitlin expressed a similar point of view and the observations showed that she spent time observing children before intervening when children were attempting to work through difficulties. Caitlin saw her role as being to observe first and then to support the child with 'verbal tools' like encouragement and specific phrases, for example 'you need to go and tell them...that's what you need to say'.

I observe first to see how things play out... also I only step in straight away if I can see real danger, i.e. a spade heading towards a head etc. Sometimes I verbally prompt if they are trying to resolve and get stuck. Some children are natural peacemakers. (C, p. 7, 26, p. 8, 29-33).

These responses reveal how Caitlin and Beverley see their role as being firstly to closely observe the play and then to decide whether their support is needed.

Both teachers gave similar responses when asked how Te Whāriki influences their role in children's learning; like the teachers in Centre A, they said they had to think hard about the question. Caitlin responded as follows:

You use the language of the document and it guides and helps us reflect on our goals and learning outcomes. (C, p. 14, 18-19).

Both teachers viewed it as taking a holistic approach to children's learning and placed the emphasis on lifelong learning because it 'covers everything'. Beverley expressed it as:

It's a big explanation of the habits and processes we need to help children develop in order to move on through life. (B, p. 18, 18-20).

Both teachers expressed the idea that teachers use the document without even realising it, with Caitlin stating that the strands within the document are visible all the time. Beverley's response included this comment:

It's amazing how much you cover in one day and you don't even know you're doing it. (B, p. 18, 17-18).

These responses reveal that the teachers use Te Whāriki as a guiding document and a tool for reflecting on practice. This finding is important because it shows the open interpretation of Te Whāriki that teachers have and a view of learning as something which just happens. Neither teacher was able to say how the document specifically defined their role in children's learning.

The findings presented in this section reveal the teachers' understandings about how best to support children to work successfully with their peers in a variety of ways. Te Whāriki has been interpreted as a guide which sees learning happening all the time, rather than a pedagogical tool which assists teachers to define their role.

Routines and peer learning

Both teachers distinguished between the learning that occurs during the centre routines and during child initiated play. Beverley and Caitlin viewed particular centre routines where the children were grouped in mixed ages as being valuable for a number of reasons. Beverley stated that encouraging older children to recite the karakia kai at the mixed age mat time strengthened their self esteem and helped them to develop confidence. Table top time, when the children were grouped together in mixed ages every day after lunch, was described as providing opportunities for the children to scaffold each other and to work together cooperatively.

Both teachers viewed child initiated play as valuable for supporting peer learning for several reasons. Beverley said that it provides lots of opportunities for children to enter different social groups and for older and younger children to spend uninterrupted time together. Caitlin saw child initiated play as providing choice and a chance to negotiate and problem solve with their peers without assistance from the teacher. She commented further that children are free to observe others and to direct their peers. Caitlin noted that if they start early enough with blocks for instance then they know they can play uninterrupted and this can result in them redoing their constructions in totally different ways, using different ideas and 'coming to that conclusion themselves'. Caitlin summed up the benefits of child initiated play:

Children have time to develop working relationships during long periods of uninterrupted play. They develop mutual respect. (C, p. 11, 10-11).

This response highlights the importance of allowing children time to develop the shared understandings which result in more complex learning. However, the beliefs

expressed here by the teachers are not reflected in the observation data which recorded specific examples of play interrupted by routines and few examples of sustained in-depth collaboration due to the nature of the centre routines. These results suggest mismatch between the teachers' beliefs and their practice.

Summary

The interviews with the teachers highlighted their awareness of the importance of peers in the learning process. The teachers identified the range of strategies they used to foster peer learning. Te Whāriki was broadly interpreted as a guide to children's learning. The teachers identified the different types of learning that occurred within routines and child initiated play, however inconsistencies between their beliefs and practice in this area were revealed.

Conclusion

The data presented in this chapter provides explanation and evidence of peer learning as it occurred in this early childhood centre. The observations revealed the impact of the centre routines on opportunities for children to learn from their peers. Within the structured routines, for example mat time, the teachers encouraged the older children to take on leadership roles with their peers. However, the grouping of children with peers of a similar age at morning tea time prevented opportunities for tuakana teina. The interruptions for lunch time and toileting precluded sustained play and on some occasions changed the direction of the play. The impact of the routines on peer learning was complex, suggesting the need for further investigation.

The data identified examples of the children using their expertise and negotiation skills as strategies to facilitate peer learning; however the nature of the centre routines limited examples of sustained collaborative play. Conversations with the

older children revealed an awareness of their knowledge and they consistently expressed concern for their younger peers; this empathy was fostered by the teachers. The teachers consistently supported children's collaborative efforts: modelling and the addition of props were key strategies.

The teacher interviews revealed the teachers' knowledge of the benefits of peer learning, with the teachers supporting their responses with specific examples. Both teachers actively encouraged the older children to be empathetic towards their younger peers and the observations showed evidence of this. The teachers outlined a range of strategies that they use to support and encourage peer learning. The teachers had some difficulty answering questions about how Te Whāriki influences their role in children's learning. They described it as a guiding document but couldn't say how it specifically defined their role in children's learning. Finally, the role of the centre routines and child initiated play in supporting peer learning was discussed and this revealed mismatch between the teachers' beliefs and their practice.

The discussion chapter which follows examines the results of both case studies in light of current research and ideas about how children learn. Rogoff's (1998) planes have been used to frame the discussion as they provide a shifting lens, revealing aspects of peer learning and their connections to others.

Chapter six

Discussion

Introduction

These case studies have explored the nature of peer learning in two early childhood settings and revealed that there are several key factors which impact on the types of experiences that children have with their peers. These factors are considered in this chapter in relation to the framework of Rogoff's (1998) planes of analysis. Analysis using the institutional plane examines the nature of the centre routines, structures and teacher beliefs, revealing how and the extent to which they support and promote peer tutoring and collaborative play. The interpersonal plane is used to analyse the interactions both between children and between the teachers and children, uncovering the strategies which children and teachers use to sustain group endeavour and support opportunities for peer tutoring. Finally, the intrapersonal plane is used to examine outcomes for children. The children's experiences with their peers as a result of the routines and structures in place in the institutional plane and as a result of the interactions in the interpersonal plane are discussed in this section.

Rogoff's three planes of analysis

The use of Rogoff's (1998) planes provided a useful analysis tool for the research topic. The different planes within sociocultural activity – the institutional, interpersonal and intrapersonal planes - make up a whole unit of analysis, in which one plane is foregrounded while the other planes remain in the background; none exist separately. This unit of analysis highlights the impact of one plane on another

and this is useful for understanding the complexities of peer learning. This method of analysis was appropriate as case study methodology focuses on 'rich description' (Mutch, 2005). A series of Venn diagrams have been used throughout the discussion as these provide a visual image illustrating the relationship between each plane of analysis.

The institutional plane

The early childhood centres involved in this study operated within different philosophies of practice. Consequently, the way the daily routines were organised, the way children were grouped and the arrangement of the physical environment differed between the centres. In addition, the teachers' beliefs about their role in children's learning determined how they supported opportunities for peer learning. These differences are clearly visible when viewed through the institutional plane as illustrated in figure one below.

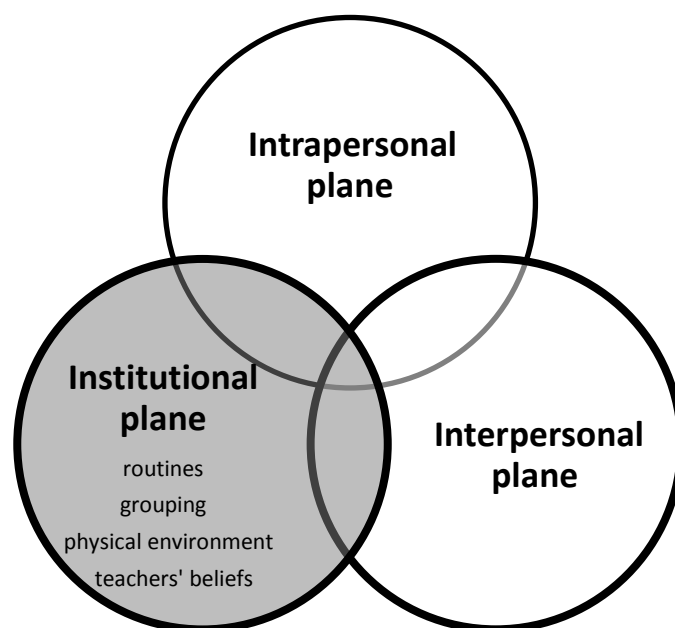


Figure 1: Rogoff's (1998) planes of analysis with the institutional plane highlighted

Routines

Each centre operated with a different approach to daily routines. The nature of the routines became an important focus of the study as they impacted on opportunities for children to engage in sustained play with their peers. The teachers at Centre A were committed to providing long periods of uninterrupted play during which time the children were free to explore and experiment with their peers. As a result, the observations in centre A revealed sustained episodes of collaborative play which were initiated by the children. The teachers were there to support the children when needed, but children were allowed to direct their own play. The amount of time that was available for children to play together without interruption allowed for negotiation to take place and for complex role play to develop. After close observation, it became apparent that the children were busy in their play, but not hurried in their interactions with each other. Wood (2004) supports the value of uninterrupted time for children to play together, stating that it allows time for children to become engrossed and to work in-depth with each other. The teachers at centre A emphasised the value of child initiated play as providing children with many choices in their play, including increased opportunities for negotiating and peer tutoring. The data from centre A contained many more episodes of peer tutoring than the data from Centre B, where in contrast the daily routines were a focus for curriculum.

Centre B operated around routine and order. The teachers worked hard to maintain a consistent plan for the day so that the same things happened at the same time during the day. However, this resulted in interruptions to group play and the data recorded many examples of these interruptions. The children were called together for morning tea and then later on for lunch. This meant that play stopped and one

example was recorded of two children hurrying to complete their carpentry before the lunch bell rang. Taking children to the toilet on a regular schedule was another example of a routine which changed the direction of the play. These interruptions often altered the children's position or role as a player. It became evident during the data collection process that the daily routines at centre B were a main focus of the centre's curriculum. Both Pohio (2006) and Claxton and Carr (2004) warn about the restrictions which routines can place on children's ability to spontaneously engage with their peers. The case studies found that routines interrupted children's play or changed the direction of it and at times prohibited sustained peer collaboration.

Mixed age grouping

Another significant finding was that the children's experiences with their peers were enriched if they could interact with children across a range of ages. The results showed that the younger children observed and then imitated their older peers; language was an important aspect of this imitation. These results provide support for mixed age groups as these provide important opportunities for younger children to work with their more capable peers who are an important source of language and knowledge (Vygotsky, 1978).

Both centres catered for mixed age groups of children but there were differences in how the children were grouped during the morning. At centre A, the children were placed in mixed age whānau groups for small group activities. They also ate their morning tea and lunch with peers of varying ages as they could choose when they had their food. Conversations with the supervisor revealed that value was placed on mixed age groups as they offer children different types of learning experiences; consequently the children were not grouped with similar age peers at any stage

during the day. This recognition of opportunities for tuakana teina is supported by Haworth, et al. (2006) who emphasise that these opportunities mean that the tuakana (older child) can scaffold the teina's (younger child) learning, "providing active teaching of skills and knowledge" (p. 41). Dunn (1996) suggests that the older children benefit too. The present study found that the older children displayed a sense of responsibility and increased self confidence as they shared their expertise during play.

In contrast, the children in centre B were often grouped according to their age for morning tea and for the morning mat time. At morning tea, there were up to four different tables with similar age children at each table. The teachers explained that this allowed them to assist the younger children who needed help and were not so familiar with the morning tea routine. The teachers passed around the fruit and reinforced aspects of the routine that the children needed to follow. However, this meant that opportunities for the older children to take on an active role and assist their younger peers were missed, because the teachers took on this role. Dunn (1996) and Prendergast (2002) recognise the opportunities such routines can present, stating that mixed age groups can benefit the teachers as the younger children are less likely to need assistance from the teacher. This implies that in mixed age groups, children have opportunities to take on teaching and leadership roles that are normally adopted by the teachers. However, these opportunities were not capitalised on in Centre B and the teachers performed these roles.

Physical environment

The findings emphasised the importance of enclosed spaces for promoting sustained, collaborative play. Both centres contained various enclosed spaces which were consistently utilised by groups of children for sustained periods of time. The

provision of enclosed spaces encouraged sustained role play and the careful addition of props was found to further provoke children's thinking and increase the complexity of their play. Support for this finding comes from previous research into collaborative play by Arthur et al. (1999) and Pohio (2006). These previous studies highlight the importance of deliberately configuring the environment with cooperative play in mind. It is up to teachers to capitalise on the beginnings of collaborative play, ensuring that the arrangement of resources supports and challenges children's collective ideas. An environment that promotes collective activity does not just happen by chance, but is promoted by teachers who recognise opportunities where they can support and extend children's ideas (Pohio, 2006).

In addition to enclosed spaces there were some particular features of centre A which encouraged the children to initiate play with their peers. The kai tables fostered social interactions amongst the children, which provided opportunities for friendships to be established across a range of ages and which also resulted in humorous word play. Because the area was out of the traffic zone and the children could come and go as they wished, the atmosphere was unhurried and relaxed. The nature of the area and the rules around its use made it a catalyst for children to form relationships with their peers. The kai tables at centre A thus gave children the opportunity to socialise and establish friendships with their peers in an unhurried way. As a result, children lingered here and engaged in many conversations which became a catalyst for the group play that followed. The social benefits of peer interactions are well documented in the literature (Cannella, 1993; Chung & Walsh, 2006; Goncu, 1993; Katz, 1989) and the organisation of the kai tables in centre A provided a physical space where children could cultivate friendships which were further developed in the play that followed.

Teachers' knowledge, beliefs and philosophies

In the interviews, all four teachers provided definitions of peer tutoring and peer collaboration that are consistent with those in the existing research. The teachers in these case studies clearly distinguished between the two terms, emphasising the teaching aspect of peer tutoring. These differences are highlighted in the literature on peer learning. Peer tutoring is compatible with social constructivism as it is associated with Vygotsky's (1978) zone of proximal development. In contrast, the teachers defined peer collaboration as children working together towards a common goal or interest. This definition of peer collaboration is supported by Hargreaves (2007) who talks about learners building on each other's contributions in order to construct shared knowledge; everyone is seen to have an equal role in this process. Tudge (2000) agrees with this explanation, stating that peer collaboration occurs between peers of equal status, whereas peer tutoring occurs amongst children who have different levels of competence. In the present study, the teacher's responses in both case studies indicate a clear understanding of the nature of peer tutoring and peer collaboration as related but different processes.

The case studies revealed a complex relationship between teachers' beliefs about how children learn and centre practices. The teachers at centre A believed it was important to ensure a balance between teacher led activities and play that was initiated and developed by the children. This balance was achieved by the provision of long periods of uninterrupted play and a rolling snack and lunch time. Group times were short and infrequent so that play was not consistently interrupted. Many episodes of complex group play taking place in this centre were identified, suggesting that this approach was part of beliefs and practices in this setting. Greenfield (2002) and Haworth et al. (2006) similarly highlight the balance needed to support peer learning, drawing attention to the importance of opportunities for

child initiated play in addition to opportunities for teachers to scaffold and direct children's learning.

The teachers at centre B also emphasised the value of child initiated play for providing valuable opportunities for peer learning; however sustained opportunities for this did not occur during the morning schedule due to the nature of the centre routines. This revealed a mismatch between the teachers' beliefs and their practice. Nuttall's (2004) research about curriculum negotiation in a New Zealand childcare centre identified a similar divide between teachers' beliefs and practices. Nuttall (2004) identified conflict between the teachers' 'official' definition of curriculum and actual practice which centred around adherence to the daily routines. Through teacher interviews and observations, Nuttall (2004) observed that the teachers adhered closely to the centre routines, effectively separating them from their teaching. She concluded that the centre routines "were the primary focus of the centre's lived curriculum" (2004, p. 93). In the present study, the daily routines were similarly a focus for the curriculum at centre B. These routines were found to inhibit the children's ability to sustain collaborative endeavour with their peers. This was despite the importance that the teachers from this centre placed on the value of uninterrupted time for children to direct their play.

The teachers in centre B did however utilise some of the routines to actively foster peer tutoring. This was most evident in the morning mat time on the occasions when the children were all grouped together. The teachers would pair the older children with their younger peers so they could help them wash their hands before morning tea. In addition, they would ask the older children to lead the *karakia kai*. When questioned about children scaffolding their peers, they acknowledged that they had to look hard to see this occurring during play. However, the teachers gave examples of children scaffolding each other at table top time (after lunch) and also

when they deliberately paired the children so they could work together. These findings suggests that they saw the routines as when this type of learning occurred, rather than recognising the potential for scaffolding within child initiated play. Haworth and colleagues' (2006) action research supports this suggestion, as their study resulted in the teachers discovering the potential for older children to assist their younger peers in play and also the importance of actively promoting peer interactions to support learning. These case studies suggest that teachers do not always recognise the potential for peer learning in play.

In the interviews, the teachers were asked how Te Whāriki (Ministry of Education, 1996) influenced their role in children's learning. All of the teachers said that they found this question difficult to respond to for a number of reasons. These ranged from Emma who said it was hard to know how to use the document, to Beverley who said that teachers use it without even realising it. Caitlin described it as a guide for reflecting on practice and Rachel stated that she relied on her own experience and knowledge to guide her involvement in children's play. Their responses indicated that Te Whāriki was seen as offering guidelines for practice, but that it was up to the teachers themselves to define and interpret their role in children's learning.

As previously argued, the interpretive nature of Te Whāriki has been critiqued by other New Zealand researchers (Clark, 2005; Cullen, 2001; Haggerty, 2003; Nuttall, 2005); while Nuttall (2004) states that its open prescription creates challenges. Nuttall (2005) argues that teachers are required to constantly negotiate the curriculum and their role in children's learning; they cannot simply enact a curriculum. The sociocultural underpinnings of Te Whāriki (Ministry of Education, 1996) presents numerous challenges for teachers, especially if this theoretical framework was not a part or a strong part of their original teacher education and

the evidence from this study, like others (e.g. Alvestad et al., 2009; Haggerty, 2003) suggests that teachers are still grappling with a deeper understanding of their role in children's learning using the curriculum document.

Alvestad et al. (2009) support this assertion, emphasising that the implementation of Te Whāriki is a complex task which requires highly trained staff. Clark (2005, p. 20) suggests that the difficulty with the implementation of the curriculum document in practical terms may be based on "the omissions of practical knowledge in favour of philosophy and ideals" within the document itself and that "there is an assumption that teachers will have the practical knowledge to implement these values and ideas through practice". The results from this study support this assumption as the teacher's responses in the interviews demonstrated their knowledge of the intent of the curriculum document but also revealed that they were less confident about implementing its ideals on a day to day basis. This is discussed in the literature by Fein and Schwartz (1982) who emphasise the need for mutual dependence between theories of development and theories of practice. In this study, the teachers interviewed demonstrated theoretical knowledge and knowledge about practice but were unable to combine the two. Furthermore, the teacher's responses suggested a preoccupation with elaborating on their theories of practice as they sought to articulate their role in children's learning (Genishi, 1992).

Summary

An examination of these case studies through the institutional plane has focused attention on critical aspects of centre organisation and beliefs about how children learn alongside their peers. Centre practices were found to impact on opportunities for children to establish and maintain sustained interactions with their peers. The results showed that the physical environment needs careful consideration if it is to

support children to work cooperatively and as peer tutors who share their expertise during play. Teachers' beliefs can conflict with their practices and the results reveal the complex nature of teaching within an interpretive curriculum such as Te Whāriki. Finally, the results suggest that teachers are not always aware of the potential for peer tutoring within play. The next section identifies aspects of teachers' practice which were found to support peer interactions, when analysed using Rogoff's interpersonal plane.

The interpersonal plane

The nature of the interactions between the children and the interactions between the teachers and the children are highlighted when viewed through the interpersonal plane. This focus on the interpersonal plane is represented in figure two. An examination of these interactions demonstrates how peer learning took place in a play based environment, revealing differences and similarities between the two early childhood centres.

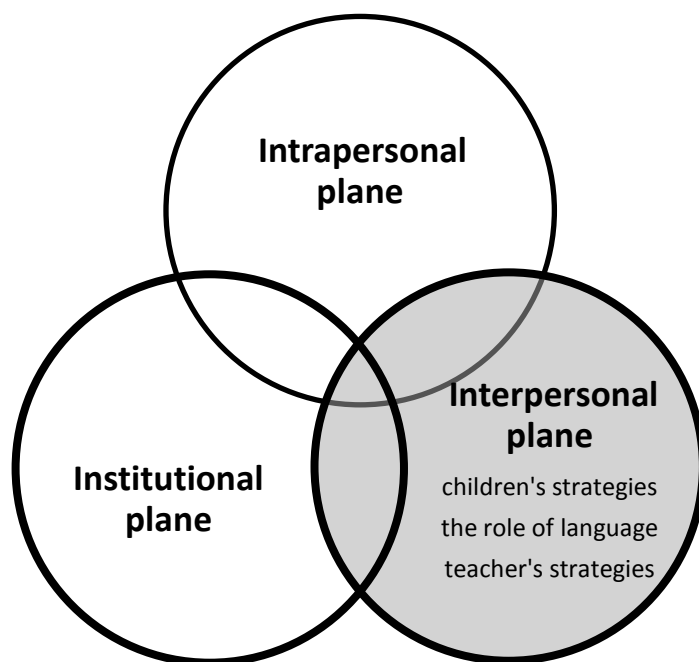


Figure 2: Rogoff's (1998) planes of analysis with the interpersonal plane highlighted

Children sharing their expertise with their peers

The case studies showed that the children used similar strategies in both centres to tutor their peers and sustain collaborative play. The children were found to be capable peer tutors who shared their knowledge and expertise with their peers as they played together. In both centres, the more capable children supported their peers within their zone of proximal development (Vygotsky, 1978), furthering their language development and mastering new skills. These children adopted an expert role using scaffolding to support their peers to successfully complete tasks or participate in play. As the children worked together, they adjusted the level of support they gave their peers and thereby demonstrated the concept of contingency management, which is an important part of successful scaffolding (Tharp & Gallimore, 1991). The observations also showed the presence of a shared purpose amongst the children and the literature identifies the presence of intersubjectivity between children as being necessary if they are to reach new understandings together (Rogoff, 1990). The presence of these strategies is supported by previous studies of peer tutoring with young children (Angelova, Gunawardena & Volk, 2006; Chung & Walsh, 2006; Fair et al., 2005; Wang & Hyun, 2009; Wood & Frid, 2005).

However, there is an important difference between the present study and the previous studies identified here. In these earlier studies the children were deliberately paired in expert and novice roles, thus allocating the role of a peer tutor to some of the children. However, the results in this study indicate that children can effectively tutor their peers in a play based environment where they spontaneously join with their peers in play. The younger children were observed seeking out their older peers and asking for help. In addition, the older children

would see potential opportunities where they could assist their younger peers. This finding is significant because it identifies the potential for peer tutoring to occur in child initiated play, and differs to previous research which suggests that deliberately pairing children is necessary to facilitate effective peer tutoring.

Negotiation and problem solving

The children consistently used negotiation and problem solving to successfully collaborate with their peers. These negotiations during play often led to the children challenging each other's ideas by offering alternative viewpoints, resulting in new, shared understandings. Observations highlighted a pattern of problem solving and negotiation which led to the children accommodating each other's ideas and working towards a shared purpose. Tudge (2000) states that peer interactions provide important opportunities for cognitive conflict to take place. This notion of 'disequilibrium' is a key idea within cognitive constructivist theory and the process of resolving cognitive conflict enables individual children to develop new perspectives and reconceptualise their current understandings with the aid of their peers (Fawcett & Garton, 2005). The findings from this current study are supported by previous studies which provide evidence that cognitive conflict amongst peers can promote cognitive growth (Greenfield, 2002; Johnson-Pynn & Nisbet, 2002; Wood & Frid, 2005). This study has provided evidence that collaborative play supports individual children to challenge their existing thinking and strategy use, potentially resulting in new understandings.

The role of language

In both centres, the children consistently used language to express their togetherness in play and to emphasise the collective nature of their endeavour. In addition to these expressions of joint ownership of play, language was often used

creatively and playfully with elements of humour evident. Previous studies have also found evidence of young children using language in this way (Alcock, 2007; de Haan & Singer, 2001; Rayna, 2001). Alcock's (2007) doctoral research showed that children develop their understandings through playing with language patterns. Termed 'word play', it is an important way that children internalise their understandings of the rules around play (Alcock, 2007, p. 286). The ongoing playfulness that was observed in this current study was expressed through word play and this assisted the children to maintain togetherness with their peers in play.

Language was an important means by which the children expressed their thinking and negotiated roles and props with their peers as they developed their play. Language was used to problem solve and as a tool for imitating peers when children wished to sustain their presence in the play. The examples presented previously illustrate the children's use of language to engage in meaningful, sustained peer interactions and to share their ideas with each other.

The social constructivist literature identifies language as the primary tool which mediates cognitive development; verbal interaction is necessary for cognitive change to occur (Löfdahl, 2005; Palinscar, 1998). This assertion was reinforced in the interviews by the teachers, who identified language as critical to collaborative play and peer tutoring. Specifically, they recognised language as a necessary tool for entry into play and as a means by which children scaffold their peers to new understandings. Löfdahl (2005) and Odegaard (2006) support these statements, identifying language as playing a critical role in shared meaning-making. Löfdahl (2005) asserts that new knowledge is created when children negotiate their interactions in play leading to shared meaning making; language is central to this process. The current study revealed a consistent pattern of negotiation as children established and sustained group play.

Teachers supporting peer learning

The teachers who were interviewed held similar beliefs about the importance of knowing the children well so that they could best support them in their play. This relationships based philosophy is consistent with the principles underpinning Te Whāriki (Ministry of Education, 1996). There was a recognised need to allow opportunities for children to work through challenges with each other, encouraging children to negotiate before deciding whether they needed teacher support. One of the teachers stated that sometimes teachers step in too quickly, not recognising the importance of opportunities for children to consider other viewpoints. These opportunities are supported in the cognitive constructivist literature which emphasises perspective taking as important for cognitive growth (Johnson-Pynn & Nisbet, 2002; Williams, 2001). Children can play an important role in challenging their peers' beliefs so that they reconstruct their existing knowledge by trying out new ideas. If teachers do not recognise this potential for learning amongst children then these important opportunities can be lost.

The data showed that the teachers in both centres frequently role modelled group entry, sharing and turn taking in order to establish collaborative play. This extended to mediating, suggesting possible solutions and supporting the children's ideas. Several examples in the observations illustrated the critical presence of the teacher to sustain meaningful play. The literature suggests that teachers have an important role to play in modelling appropriate peer interactions, encouraging children to try out their ideas and supporting children's thinking through questioning (Burnard et al., 2006; Wood & Frid, 2005). In this study, when teachers suggested ideas and encouraged children to be active problem solvers, children responded by directing their learning with the support of their peers as resources.

There were some differences in how the teachers promoted peer learning across the centres. The importance of whānau was clearly evident in centre B. Families were warmly welcomed and many siblings attended together. This philosophy was reflected in the teachers encouraging the children to be nurturing and empathetic towards their peers. The older children were frequently observed assisting the younger ones with tasks that they found difficult and they consistently displayed concern for their younger peers. A conversation with an older child in which she expressed concern at not being able to assist the younger children after she went to school is an example of the extent of the caring attitudes which existed.

The observations also revealed that the children in this centre were often paired to go to the bathroom to wash their hands before morning tea. The older children liked the responsibility of this and were nurturing towards the younger children who enjoyed being with their older peers. Jones' (2007) research confirms that when children are paired as peer tutors, it results in them developing more caring attitudes towards their peers. This pairing in the present study was effective in promoting relationships between children of all ages. Some connections with the notion of apprenticeship within a community of learners model (Rogoff, 1995, 1998) can be made here. The emphasis that the teachers placed on the children caring for each other reinforces the children's active involvement in the centre community. Pairing the older and younger children provides important opportunities for younger children to learn from their more capable peers as they participate in a community of learners together.

The teachers at centre A created opportunities for peer learning in a different way. For example, Emma placed importance on using language to interpret children's play and she frequently extended children's group play with new ideas, and thoughtful questions. She got very involved with groups of children and the long

periods of uninterrupted play meant that she could focus on being with the children for sustained periods of time. Pantaleo's (2007) and Brown's (2006) research of peer collaboration identified the need for teachers to encourage and extend children's use of language and ideas. Pantaleo (2007) found that children needed to be supported to use language to think collectively in order to extend their understanding. Emma's close involvement with the children and her emphasis on the use of language and questioning often resulted in sustained complex play developing amongst the groups of children that she was working with.

Rachel (also a teacher at centre A) used a variety of techniques to support collaborative endeavour as it unfolded. Rachel was often playful with groups of children; she had a sense of fun and spontaneity that was contagious. This encouraged the children to take risks and to try out new ideas in their play; it was empowering for them. However, it was the changes that she made to the physical environment which had the most impact. She often changed aspects of the physical environment to create enclosed spaces for children to use. On several occasions, the observations documented children's use of these changed spaces to engage in sustained role play. Rachel believed that children like and need their own private space away from adults where they can play uninterrupted by adults. This assertion is confirmed by Goncu and Weber (2000) whose research found that young children's collaborative interactions are influenced by the power within relationships. Peer relationships invite participation on equal terms and by providing private space for the children, Rachel accepted the children's need to have their own space away from adults so they could collaborate with their peers without the power dynamics which adults bring to children's play (Leseman et al., 2001).

Summary

The discussion in this section has focused on the interactions between the children and between the teachers and the children. The results have identified that children confidently share their expertise with their peers and can spontaneously seek each other out when they need assistance. Through negotiation with peers, children learn to adopt different perspectives and these opportunities to experience cognitive conflict assist cognitive growth. Language is an important tool for a number of reasons and teachers can use language to extend children's collective endeavour. Teachers need to interpret their role in peer learning as they have an important role to play in establishing and sustaining both peer collaboration and peer tutoring.

The intrapersonal plane

The children's experiences with their peers are foregrounded in this plane as illustrated in figure three. This section discusses the children's experiences as a result of the routines and structures in place in the institutional plane and as a result of the interactions in the interpersonal plane. The study found that children can support each other effectively in a play based environment; however there are some significant factors within the institutional and interpersonal planes which enhance the nature of children's experiences with peers. It is important for teachers to understand these factors if children's experiences with their peers are to be optimised. These factors are identified and discussed in this section.

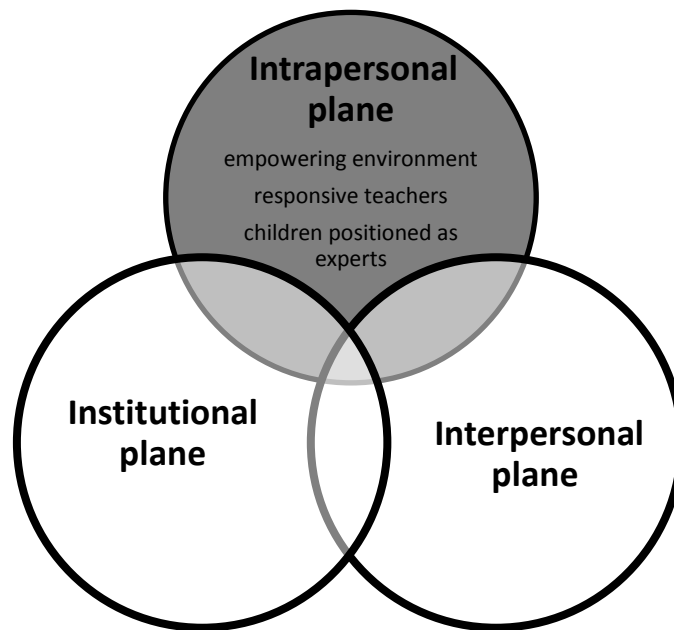


Figure 3: Rogoff's (1998) planes of analysis with the intrapersonal plane highlighted

Children's experiences as a result of factors in the institutional plane

The results found that children's learning experiences with their peers were optimised when the physical environment was enhanced to promote collaborative play and provide opportunities for peer tutoring. Furthermore, the current findings indicate the need for children to have opportunities to take charge of their play. The sandpit tap in centre A is an example of an aspect of the learning environment which afforded such opportunities. The children were able to be capable peer tutors who assisted the younger children to master the operation of the tap. Burnard et al. (2006, p. 258) talk about an 'enabling context' in which children's autonomy is supported by the environment. The tap in centre A embodies this idea as the children were able to direct their play, actively supporting each other. The children could control the flow of water without adult help and were frequently observed working cooperatively and negotiating together. If children are to be positioned at the centre of the learning experience then these results emphasise that the

environment needs to empower children to learn alongside their peers. Claxton and Carr (2004) and Jordan (2004) advocate for environments that not only invite shared involvement but also share the power amongst learners and teachers.

Children's experiences as a result of factors in the interpersonal plane

Children were supported in collaborative endeavour by the teachers in a variety of ways in both centres. The ability of the teachers to respond to play that children initiated with their peers made a critical difference to how successful and sustained the play was. The results highlighted the importance of teachers consciously interpreting their role in response to the play that is unfolding in front of them. Their recognition of the important learning that can transpire between children and their peers and their response to this learning is crucial. The adoption of a responsive presence by the teacher is discussed by others in the literature (Clark, 2005; Hill, Stremmel & Fu, 2005; Siraj-Blatchford, 2004) and Wood (2004) states that the role of adults in interacting with children in play requires a high level of skill and ability. Siraj-Blatchford (2004) highlights the interactive aspects of learning and the need for responsive teaching as this supports the crucial patterns of exchange which are established between children within joint activity. The current study has found that teachers are required to consistently interpret their role in children's collaborative endeavour. Their involvement needs to shift in response to children's participation with their peers in play.

During informal conversations with the children as they played, the older children in both centres expressed their expertise and this was often voiced as 'I'm bigger and I know lots'. On one occasion I was told 'we are the teachers' in response to my questions about a mat time game the children had initiated. In another

conversation, a child was able to articulate how he teaches his friend new skills. These findings are significant because they demonstrate metacognitive awareness of the ability to share knowledge with a peer. These results are supported by previous research which has examined the child's perspective of their role as a peer tutor and found that when given the opportunity to express themselves, children can clearly articulate a conception of teaching and learning (Jones, 2007; Sheridan & Pramling Samuelsson, 2001; Williams, 2007).

Clearly, the children had explicit conceptions about their ability to teach their peers but there was little evidence of the teachers fostering this expertise in a deliberate, thoughtful manner in either centre. Instead, the data revealed sporadic evidence of teachers positioning children as having some expertise. This occurred in centre B where the teachers asked individual children to lead the *karakia kai* before morning tea; this took place each morning but the data recorded no other examples. These results suggest a contradiction between the children's perceptions of themselves as teachers and the teacher's lack of recognition of children's expertise.

These results were unexpected given the premise of *Te Whāriki* which positions children as competent and capable learners (Ministry of Education, 1996). These particular findings were also surprising in light of current theory and currently popular postmodern ideas which position children as powerful and active in the learning process (see Dahlberg, Moss & Pence 1999; James & Prout, 2001; Woodhead, 2003). Anning (2004, p. 59) draws attention to post modern conceptions of children in which they are seen "as having power and agency in their own right". The teachers did not actively recognise and respond to children's expression of themselves as capable and effective peer tutors and there was little evidence in both centres of planned opportunities within the curriculum for children to express their expertise as peer tutors. One possible explanation could be that the

teachers were unable to fully grasp the notion of empowerment and recognise what this means in terms of practice. Nuttall (2004) states that successful implementation of Te Whāriki depends on teacher's exploration of concepts such as empowerment which she termed a sophisticated, abstract concept. Clearly teachers need to understand the intent of empowerment so that they can embed this key principle of Te Whāriki into their practice and in doing so, allow children to take a more active teaching role.

Summary

The nature of children's experiences with their peers varied according to factors within the institutional and interpersonal planes. The arrangement of the physical environment was found to be crucial and careful consideration needs to be given to ensure that the environment not only supports collaborative activity, but allows children to direct their own learning in negotiation with their peers. A responsive teacher presence is critical and coupled with this is the need to position children as experts who are capable of sharing their expertise with their peers to advance their understanding.

Conclusion

This study has found that the nature of peer learning in an early childhood setting is complex and if it is to be effective, then it requires attention to factors within all of the three planes of analysis outlined here and illustrated in figure four. Structural factors within the institutional plane such as routines, grouping and the physical environment can create a climate of possibilities where children can direct their play alongside their peers. However, teachers need to ensure that these aspects support rather than prohibit children from sharing their expertise with their peers. The relationship between teachers' beliefs and practice was identified as inherently

complex, suggesting the need for further investigation. Children were identified as active peer tutors within the centre environments, using negotiation, language skills and problem solving strategies to work with their peers. However, teachers need to capitalise on this learning and not just think that it will happen. The results highlight the importance of teachers being closely connected to collective activity so that they can make decisions about their response to play as it unfolds. This requires teachers to both respond to children's collaborative efforts in addition to actively promoting peer tutoring within the mixed age settings observed. In conclusion, factors within all of Rogoff's (1998) three planes of analysis need to be working together if children's peer learning experiences are to be optimised.

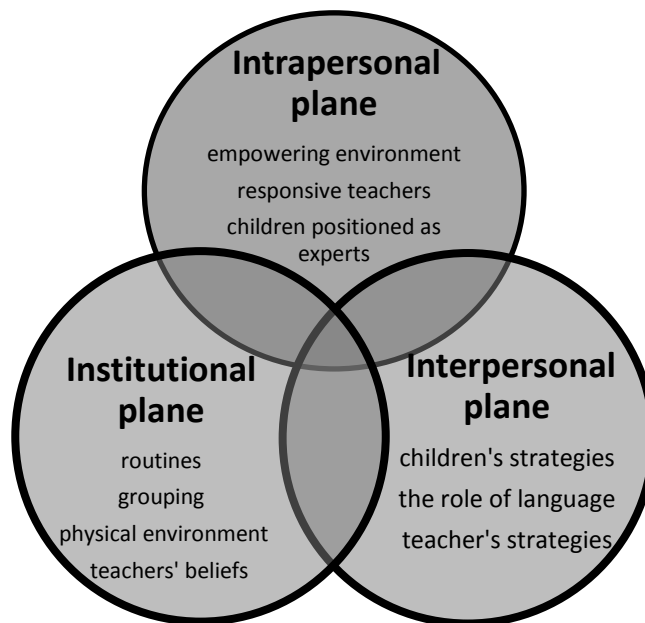


Figure 4: Rogoff's (1998) planes of analysis with all planes working together

In the following chapter, the research questions are answered in light of the previous research on peer learning. The methodology adopted in this study is reflected on, before implications for teachers' practice and further research are presented. Concluding comments summarise the key findings.

Chapter seven

Conclusion

Introduction

The chapter begins by outlining the focus of this study, including restating the research questions. The questions were pivotal to this exploratory case study and they are addressed in relation to research into peer learning; this serves to situate this study into the current body of research. The discussion then moves on to examine the strengths and weaknesses of the research methods adopted. In reflecting on the methodology, the research decisions are examined and justified. The study has implications for teachers' practice in a play based environment and these implications are identified and discussed. Possibilities for future research are then outlined as there needs to be further consideration of the factors which influence children's experiences with their peers in an early childhood setting. Finally, concluding comments summarise the key findings of this research.

Study focus

Recognition of the social nature of children's learning highlights the important role of peers in this process. This thesis examined peer learning as it unfolded in two early childhood centres, examining peer tutoring and peer collaboration as related processes which are central to children's learning. Case study methodology was adopted as it allowed the complexities around peer interactions to be identified. The study aimed to investigate how children worked together collaboratively and as peer tutors; the children's perceptions of themselves as peer tutors were also examined. Teachers' knowledge of peer learning and the impact of this on their practice was

explored and the role of the learning environment in fostering effective peer interactions was analysed. The study was focused around the following questions:

1. What specific strategies do children use as they collaborate together and tutor each other in an early childhood setting?
2. What knowledge do children have about learning from each other?
3. What knowledge do early childhood teachers have about peer learning?
4. How does the knowledge teachers have inform their practice in this area?
5. Does a play based environment provide opportunities for children to work together as peer tutors, and if so how?

The research questions came out of a review of the literature on peer learning which identified the need for further qualitative research into peer learning in early childhood settings. A summary of answers to the research questions follows.

1. What specific strategies do children use as they collaborate together and tutor each other in an early childhood setting?

The children were found to be capable peer tutors who scaffolded their peers within their zone of proximal development (Bruner, Ross & Wood, 1976; Vygotsky, 1978). The children were skilled at adjusting the level of support they gave their peers in order for them to succeed at the task they were attempting. Negotiation of props and roles and problem solving were consistent strategies which the children adopted to sustain their play and to reach shared understandings. The critical presence of intersubjectivity for cognitive growth is emphasised by Rogoff (1990). Working collaboratively provided important opportunities for the children to consider alternative viewpoints. The literature identifies cognitive conflict as an important part of peer learning (Meadows, 2006; Tudge, 2000). The presence of cognitive

conflict in this study also supports the increasing 'interface' of cognitive and social constructivism which Cullen (2001) identifies.

The younger children were frequently observed intently watching their older peers and then imitating them using both language and actions to do so. Language was an important mediating tool through which the children expressed the collective nature of their play and joint ownership of their actions. These findings are consistent with research by Alcock (2007) and Odegaard (2006). These findings demonstrate that children can spontaneously tutor their peers in a play based environment and they are consistent with the literature which identifies the particular components of peer learning outlined above. However, this study differs from previous research which has occurred mainly in structured environments especially configured to induce peer tutoring and in doing so, demonstrates that children can spontaneously take on the role of peer tutors in a play based environment.

2. What knowledge do children have about learning from each other?

The children in this study demonstrated that they have clear conceptions of their ability to teach their peers and this was stated confidently and consistently in the informal conversations that took place with them. The results found that the younger children perceived their older peers as sources of knowledge and sought them out when they needed assistance. These particular results are commensurate with previous studies (Sheridan Pramling, 2001; Williams, 2001). There was evidence of the older children demonstrating empathy towards their younger peers, resulting in trust which helped to strengthen the relationships between children across a variety of ages. Jones (2007) and Chung and Walsh (2006) highlight the

need for opportunities for children to develop trusting relationships as these provide a platform for effective peer learning.

3. What knowledge do early childhood teachers have about peer learning?

The teachers demonstrated in-depth knowledge of the nature and benefits of peer learning and were able to give specific examples of it occurring in practice. All of the teachers interviewed found it difficult to articulate how Te Whāriki guided their role in children's learning, concluding that it provides guidelines for practice, leaving them to interpret their role in children's learning. The interpretive nature of Te Whāriki is well documented in the literature (Cullen, 2001; Edwards & Nuttall, 2005; Haggerty, 2003). There was some conflict between teachers' beliefs and practice and this was most noticeable in relation to the routines used at centre B. The teachers at this centre expressed the importance of opportunities for child initiated play; however the nature of the routines resulted in interruptions which impacted on the children's ability to direct their own learning alongside their peers. Nuttall's doctoral research (2004) in an early childhood centre identified similar conflicts as teachers grappled with notions around curriculum.

4. How does the knowledge teachers have inform their practice in this area?

The teachers played a critical role in supporting peer learning using a variety of teaching strategies to do so. The role that the teachers adopted included using language and questioning to extend the children's collaborative efforts, encouraging the older children to assist their younger peers and reconfiguring the physical environment in a number of ways. There is also evidence in the literature of these strategies being used by other teachers (e.g. Arthur et al., 1999; Brown, 2006). The teachers stated that it was important to observe children's play before deciding whether to become involved; they recognised the importance of children learning to

negotiate with their peers. Wilkinson et al. (2000) and Fawcett and Garton (2005) identify the need for observation and the provision of opportunities for cognitive conflict.

However these strategies were influenced by a number of factors. For example the daily routines at each centre were found to impact on the teacher's ability to actively support children's collaborative play. The particular routines at centre B conflicted with the teachers' beliefs about the importance of opportunities for uninterrupted play and this result is consistent with Nuttall's (2004) findings. This study found that teachers' practice was most effective when a responsive teaching presence was adopted. Siraj-Blatchford (2004) advocates for this style of teaching as it supports the idea that learning is situated and influenced by the social context which it takes place in.

5. Does a play based environment provide opportunities for children to work together as peer tutors, and if so how?

A play based environment was found to provide numerous opportunities for children to tutor their peers and to engage in collaborative endeavour. However, the quality of these interactions was greatly enriched when the learning environment was deliberately enhanced in a number of ways. Enclosed spaces were found to support collaborative play as they provided children with a collective space for establishing group play. The study found that when teachers altered the environment through the addition of props or by reconfiguring resources and equipment that this could sustain and extend the play. Pohio's (2006) study of collaborative play in an early childhood setting identified similar findings. Creating a learning environment that promotes autonomy was found to be important as it provides opportunities for collective decision making amongst children. Burnard et al. (2006) term this an

'enabling context' and Jordan (2004) emphasises the need for power sharing between learners and teachers in order to promote co-construction of knowledge. Clearly, the physical environment is an important factor in maximising opportunities for children to engage in meaningful learning with their peers.

Reflections on the methodology

Strengths of this approach

Case study methodology was appropriate for this study as it allowed the complex nature of peer learning to be explored in some depth. The use of multiple cases revealed similarities in the data across the two centres; patterns identified strengthened confidence in the findings. The use of multiple cases also meant that differences in the results could be compared and the reasons for these differences explored. Being able to compare and contrast the results from the two cases helped to identify the issues around peer learning. Bassey (2003) and Stake (2008) support the use of multiple cases for these very reasons.

Case studies require evidence from multiple sources and triangulation of the data took place in order to ensure trustworthiness was achieved. A combination of teacher interviews, observations and conversations with the children ensured that evidence came from several sources. Denscombe (2007) identifies triangulation as critical to ensuring data validity. The analysis process relied on comprehensive connections to contemporary theory, ensuring that any inferences made from the data were valid. Yin (2003) identifies logical inference as an important part of ensuring validity of case study data. Constant comparative analysis (LeCompte & Preissle, 1993) and Rogoff's planes of analysis (Rogoff, 1998) were used to draw together answers to the research questions. Major themes were identified within

the planes of activity, allowing the key components of peer learning to be identified and examined through different lenses.

An important part of the data collection phase were the ongoing conversations that took place with the teachers during the observations. These conversations provided opportunities for the teachers to talk about what was being recorded as the observations took place, to talk about groups of children and their play. This information sharing was invaluable and the teachers commented how much they had benefited from these informal conversations which had resulted in them reflecting on their practice in this area. In addition, they were an important means of building trust between researcher and participants during the data collection phase. Cullen et al. (2005) term this a relationships' perspective and this approach was appropriate for the study setting.

Limitations of this approach

The use of observations, interviews with teachers and conversations with the children proved to be an effective means of exploring the nature of peer learning in an early childhood setting. However, the observations were limited in that they only captured the morning routines in each centre. Extending the length of the observation period each day would have provided further insight into centre practices and opportunities for peer learning. Longer periods of observation time could have been used to identify if children passed on knowledge to other children.

When discussing the observation of children in early childhood settings, McLachlan et al. (2010, p. 100) recognise "that the process of observing can never be neutral" and my own experiences of early childhood education will have shaped my observations. However, the use of constant comparative analysis (LeCompte &

Preissle, 1993) to identify emerging themes and Rogoff's (1998) planes of analysis in this study helped to ensure confidence in data interpretation.

The interviews were constrained by the availability of the teachers due to the regulations around teacher ratios and the numbers of teachers who were required to be with the children at any one time. The interviews took place during the day at the suggestion of the supervisors and one was conducted in the centre laundry amongst the nappy buckets due to there being no other space available. One hour was allocated for each interview and this was strictly adhered to due to the teachers needing to return to their teaching role. Conducting the interviews in another location with further time available may have resulted in a deeper exploration of the topic. Another possibility would be interviews with children about learning with their peers, but this would be dependent on child agreement.

The conversations with the children were relatively brief and more time to explore their conceptions would have been useful. Conducting the observations over a longer period of time could have resulted in more in-depth relationships being developed and would have allowed further conversations to take place.

The conversations that occurred with the teachers during the observation period were unexpected and they consistently stated the value of these. However, these conversations may have influenced their practice and indeed in centre B, the teachers began to document episodes of peer tutoring. These were displayed with photos on the planning board. In any research it is important to be aware of what Denscombe (2007) terms 'researcher presence', an inevitable part of qualitative research.

Part of the selection criteria was ensuring that the centre provided long periods of uninterrupted time for children to play. The Education Research Office reports were

used to establish this aspect of the criteria. However, on arriving at centre B, it was apparent that the daily schedule was based around a series of routines, resulting in short periods of time for child initiated play which the ERO report did not reveal. I was committed at that stage to proceeding with the research, but this experience provides an important lesson in establishing this level of detail before entering the field, although it would have to be done sensitively and ethically.

Implications for practice

This study has important implications for teachers' practice. The study has identified a lack of clarity around the teachers' role as expressed within Te Whāriki and as debated in the literature (e.g. Clark, 2005; Edwards & Nuttall, 2005; Haggerty, 2003). However, it has also identified a number of practices which teachers can implement to support and enhance peer learning.

Teachers could ensure that the physical environment contains inviting, enclosed spaces as they have been found to promote collaborative activity. Spaces for children to develop friendships across a range of ages are valuable as demonstrated by the provision of kai tables in centre A. Grouping children in mixed age groups promotes tuakana teina and this fosters peer tutoring. Research by Haworth et al. (2006) highlights the important learning opportunities for children which occur when they are grouped in mixed age settings. The addition of props can help to sustain group endeavour and teachers need to capitalise on children's ideas and suggestions by providing appropriate resources.

Teachers can create empowering environments where children can direct their learning. An environment that is enabling encourages children to make their own decisions and to take on teaching roles with their peers. Burnard et al. (2006) strongly advocate for learning environments that support power sharing amongst

teachers and learners. Teachers can ensure that daily routines are supporting opportunities for children to engage in meaningful, sustained play, rather than inhibiting and interrupting play. Research by Pohio (2006) and Claxton and Carr (2004) emphasise the importance of ensuring that routines support children's learning and promote autonomy and unhurried exploration of the learning environment.

Teachers should adopt a responsive presence in children's play, interpreting their role in response to the children's efforts to engage in collective activity. To do this successfully, teachers need to engage in power sharing, positioning children as experts who can successfully direct their own learning. Support for these ideas comes from Siraj-Blatchford (2004) who identifies a responsive teaching presence as an important aspect of quality teaching practice. The notion of empowerment is clearly expressed within Te Whāriki (Ministry of Education, 1996) and teachers need to critically reflect on their practice to ensure that the learning environment that they are providing allows children to develop their own ideas alongside their peers. Initial observation by teachers is important as children need opportunities to engage with alternative viewpoints and negotiate their play without adult intervention. Finally, teachers could readily provide opportunities for children to share their knowledge with their peers. Promoting relationships between older and younger children is one way to do this and teachers need to create opportunities within the curriculum for this.

Implications for further research

Earlier research into peer tutoring has been mostly situated in structured classroom settings where the children are paired in expert and novice roles and are given specific tasks to work on together. This study has differed in that it has examined

peer tutoring in play based environments and discovered that young children can effectively tutor their peers in spontaneous moments during play. There needs to be further research of the potential for this type of learning within play based environments as this study was carried out on a small scale. A more in-depth study would help to address some of the limitations outlined in the previous section. Fler, Anning and Cullen (2004, p. 176) support further research into peer learning in this setting, claiming that “Vygotskian-derived research in early childhood settings has been more likely to focus on adult-child interactions than on collaborative peer processes”. There is clearly potential for further study of peer learning to assist teachers’ understandings of this type of learning.

In addition, this study has uncovered the complex nature of teacher beliefs about their role in children’s learning. The study has identified conflict between what teachers know about how children learn from their peers and what happens in practice. This needs further investigation. For example:

- How do teachers form beliefs about how children learn?
- Are their beliefs influenced by teacher education?
- Are the beliefs formed during teacher education able to be enacted within dominant theories of practice in centres?
- Do teachers’ experiences in different settings continue to influence their understandings and if so, how?

Further study is needed to answer these and other questions.

Concluding comments

This study has identified that children do learn through peer tutoring and peer collaboration in early childhood education settings. However, children’s experiences with their peers can be significantly enhanced in a number of ways. Teachers are

challenged to ensure that children have sustained opportunities to tutor their peers and to engage in collaborative endeavour; the daily routines need careful consideration as these can inhibit or support these opportunities. Teachers need to adopt a responsive presence, balancing the power between learners and teachers. Positioning children as experts who can direct their learning in an enabling environment will ensure that the true intent of empowerment, as expressed in Te Whāriki, is realised.

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Appendix A: Interview questions – teachers

- What do you know about how children learn from their peers?
- Can you tell me what you understand about the terms peer tutoring and peer collaboration?
- How do you think a free play environment provides opportunities for children to work together?
- How do you think a free play environment provides opportunities for children to take on the role of peer tutors?
- When children are working together and conflict develops, how important do you think it is that children arrive at a solution together? Or would you intervene to help them resolve the problem?
- Do you think that children can effectively scaffold each other's learning and if so how might they do this?
- What do you think are the benefits of children working together without adult intervention?
- Do you think that young children should be given the opportunity to work together over sustained periods of time (without adult guidance) and if so why?
- Do you provide opportunities for younger children to work with older children and if so how do you do this?
- Do you 'buddy' up new children with older children when they first arrive?
- Are there particular activities that you would encourage children to work at together?
- Do you model specific strategies for children to use when working together and if so what are these?
- How does Te Whāriki influence your role in children's learning?
- The interview would then finish with questions relating to relevant play episodes that I have observed and the teacher's role within these.

Appendix B: Human ethics application



Massey University

9 October 2009

Ms Penelope Smith
104 Long Melford Road
PALMERSTON NORTH

OFFICE OF THE ASSISTANT
TO THE VICE-CHANCELLOR
(RESEARCH ETHICS)
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64 6 350 5575
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humanethics@massey.ac.nz
animalethics@massey.ac.nz
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Dear Penny

**Re: HEC: Southern B Application – 09/53
The role of peers in children’s learning**

Thank you for your letter dated 9 October 2009.

On behalf of the Massey University Human Ethics Committee: Southern B I am pleased to advise you that the ethics of your application are now approved. Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

A handwritten signature in black ink, appearing to be 'Karl Pajo'.

Dr Karl Pajo, Chair
Massey University Human Ethics Committee: Southern B

cc A/Prof Claire McLachlan
School of Arts, Development & Health Ed
PN900

Dr Alison Arrow
School of Educational Studies
PN900

Mrs Kama Weir, HoS
School of Arts, Development & Health Ed
PN900

Prof Howard Lee, HoS
School of Educational studies
PN900

Mrs Roseanna MacGillivray
Graduate School of Education
PN900

Massey University Human Ethics Committee
Accredited by the Health Research Council

To Kūmanga
ki Pūrehuroa

Appendix C: Letter of invitation to centres



Massey University

COLLEGE OF EDUCATION

To Kōwhiri o Te Mātauranga

SCHOOL OF ARTS, DEVELOPMENT
AND HEALTH EDUCATION

• Arts Education
• Counselling & Guidance
• Early Years
• Health Education
• Human Development
• Physical Education
Private Bag 11 222,
Palmerston North
New Zealand
T 64 6 356 9089
F 64 6 351 3353
www.massey.ac.nz

Date

Address of early childhood centre

To the teaching team at _____ centre.

My name is Penny Smith and I am writing to invite your early childhood centre to become involved in a research study entitled "*The role of peers in children's learning*". This research is for the thesis part of my Master of Education degree through Massey University.

The main aim of the study is to explore the nature of peer learning and the opportunities for it within early childhood settings. Specifically, I wish to explore how children work together collaboratively and as peer tutors. By talking with the children I aim to explore their awareness of adopting a teaching role with their peers. I also aim to observe how teachers support peer learning and what role a free play environment has in promoting opportunities for collaborative endeavour. This study will provide useful data for teachers who wish to foster a collaborative environment where children can learn from their peers.

I anticipate that the study would entail about six weeks of involvement for your centre. At the beginning of the study, I would meet with your teaching team in order to outline the research aims and answer any questions you might have. I would then arrange to visit your centre twice in order to familiarise myself with your centre routines, staff and children. After these two visits, I would come in over a period of a week at a mutually convenient time, to carry out five two hour observations of the children working together during play. The observations would be used to gather data on the peer tutoring and peer collaboration strategies the children use and also so I can see how teachers promote opportunities for children to work together.

After the observations have been completed, I would like to make a time to interview two members of your teaching team at a time which suits them. The purpose of the interviews is to explore the knowledge that teachers have about how children learn from each other and also to talk about particular play episodes which I have observed in which that teacher has been involved. After the observations and interviews are complete and the information has been written up, I will make a time to report back to your centre, asking you to comment on the data that I have gathered before it is written up. I will give you a copy of the final research report at the completion of the study.



I have attached the information sheets for teachers and for parents, which provide further information about the study.

If you are interested in taking part in this study, can you please contact me as soon as possible, so that we can discuss it further. I can be contacted on (06) 356 9099, ext 8835 or by email p.j.smith@massey.ac.nz

I look forward to your reply.

Yours sincerely

Penny Smith
Senior Tutor, Early Years
Massey University College of Education

Please do not hesitate to contact one of my supervisors if you have questions about the project. Their contact details are as follows:

Associate Professor Claire McLachlan
Associate Professor, Early Years Education
School of Arts, Development and Health Education
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Dr Alison Arrow
Lecturer
School of Educational Studies
Massey University College of Education
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"This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 99/53. If you have any concerns about the conduct of this research, please contact Dr Karl Poja, Chair, Massey University Human Ethics Committee: Southern B, telephone 04 801 5799 x 6929, email humarethicsou@b@massey.ac.nz."

Appendix D: Information sheet – teachers



SCHOOL OF ARTS, DEVELOPMENT
AND HEALTH EDUCATION
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- Counselling & Guidance
- Early Years
- Health Educator
- Human Development
- Physical Educator
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The role of peers in children's learning

INFORMATION SHEET FOR TEACHERS

Researchers' introduction

My name is Penny Smith and I am conducting research in early childhood centres to understand more about the nature of peer learning and the opportunities for this within a play based learning environment. I lectured in the early years team at Massey University College of Education and I am passionate about the learning that happens in the early years. This research is for my thesis as part of my Masters in Education degree through Massey University. This project will be supervised by Associate Professor Claire McLachlan and Dr Alison Arrow. Both Claire and Alison have extensive experience and expertise in conducting research in early childhood settings.

Project Description and Invitation

The aims of the project are to identify how a free play environment provides opportunities for peer collaboration and peer tutoring and to identify which strategies children use when working with their peers. I also want to find out what teachers know about how children learn from each other and to examine how they use their knowledge of this in practice. I invite your involvement with this project.

Participant Identification and Recruitment

I am visiting early childhood centres where children are grouped together for play across a range of ages. This is a factor which promotes opportunities for children to 'tutor' each other. I will only be visiting two early childhood centres and interviewing up to two teachers at each centre to keep the project manageable. There is no direct payment for participation in this project, however at the conclusion of the research I will share my findings with the teaching team and a copy of the findings will be given to the centre. I do not foresee that there are any potential risks to the centre from the research and it is hoped that the knowledge gained will add to our understanding of how children learn from each other.

Project Procedures

The research involves:

- An initial information sharing session with the teachers to outline the aims of the research and to answer any questions which staff may have.
- Two initial two hour visits to your centre in which I will familiarise myself with the children, staff and routines. This will also be an opportunity for informal conversations with staff who may have further questions.
- Five two hour visits where I will carry out full observations. The purpose of these observations will be to gather data on children's peer tutoring and collaborative strategies, to observe the relationship between the learning environment and the opportunities for children to work together and to capture the teacher's practice in this area. I will also chat informally with the children in order to gain their perspective about what's happening in their play. While I am visiting your centre I hope not to influence the children's play, but to observe it as it happens.
- One hour interviews with two teachers in your team. These will be an opportunity for some discussion about what I have seen in the previous observations. The interviews will explore the knowledge teachers have of how children learn from their peers.



- A report back session where I will share my findings and invite comment on these. A final summary of the findings will be given to the centre at the conclusion of my research.

What will be asked of teachers?

Requests of the teachers may include time for the following activities:

- Reading information about the research and signing consent
- Attending an initial information sharing session
- Passing on information sheets and permission forms to parents
- Communication via email or phone (your preferred method) regarding details of visits to your centre. This contact would continue over the course of the data collection phase
- Possible participation in an interview about beliefs and practices in the area of peer learning
- Attend a reporting back session to view and comment on the results before they are written up in their final form

It is expected that these required activities would take about three to four hours in total.

What will be asked of parents?

- Reading information about the project and signing consent for their child to be part of the observations

Data Management

I want to use the data from the observations to reveal the range of strategies which the children use when working together. As well as gathering this information, I want to find out more about how teachers promote opportunities for peer learning and I hope to observe this. The observations will also provide an opportunity to discover what relationship there might be between the learning environment and peer collaboration and peer tutoring.

The interviews with teachers will provide an opportunity to follow up on what I have observed as well as being a chance to talk with teachers about their knowledge and beliefs in this area. The data collected will provide further insight into the benefits of children working together collaboratively and as peer tutors and how teachers can best promote opportunities for children to work together in this way. At the conclusion of the project, I will give each centre a copy of the final report.

No identifying information such as the name of the centre or the children and teachers will be used in the final report. During the project, electronic files will be kept on a dedicated memory stick and kept safe by me. After five years, the records will be shredded and electronic files deleted.

Participant's Rights

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study up until the data is collected and being analysed;
- 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 the project findings when it is concluded.
- If being interviewed, you may ask for the recorder to be turned off at any time during the interview

Project Contacts

Please do not hesitate to contact me or one of my supervisors at any time if you have questions about the project. Our contact details are as follows:

Penny Smith
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"This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 69/53. If you have any concerns about the conduct of this research, please contact Dr Keri Pajo, Chair, Massey University Human Ethics Committee: Southern B, telephone 04 801 5799 x 6929, email humanethicsouthb@massey.ac.nz."

Appendix E: Consent form – teachers



SCHOOL OF ARTS, DEVELOPMENT
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- Counselling & Guidance
- Early Years
- Health Education
- Health Development
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The role of peers in children's learning

PARTICIPANT CONSENT FORM FOR TEACHERS

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 interview being sound recorded.
- I agree to participate in this study under the conditions set out in the Information Sheet.

Signature: _____ Date: _____
Full Name - printed _____

Appendix F: Information sheet – parents



SCHOOL OF ARTS, DEVELOPMENT
AND HEALTH EDUCATION
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- Counselling & Guidance
- Early Years
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The role of peers in children's learning

INFORMATION SHEET FOR PARENTS/GUARDIANS

Researchers' Introduction

My name is Penny Smith and I am conducting research in early childhood centres to understand more about how children teach each other and work together with their peers to explore new ideas and challenge each others thinking. I lecture in the early years team at Massey University College of Education and I am passionate about the learning that happens in the early years. This research is for my thesis as part of my Masters in Education degree through Massey University. This project will be supervised by Associate Professor Claire McInerlin and Dr Alison Arrow. Both Claire and Alison have extensive experience and expertise in conducting research in early childhood settings.

Participant Recruitment

I am asking teachers in two early childhood centres and children age two to five years within each of those centres to take part in this study. The centres will be local early childhood centres with children from a range of ages and a range of socioeconomic groups. My purpose is to identify how children learn from each other and what role the teachers and the environment play in supporting this type of learning.

Project Procedures

To find out more about how children work together with their peers, I will be visiting your centre and observing the children's play over a series of five weeks. I will also chat informally with the children to gain their perspective about what's happening in their play. I will observe the children who I see are working closely together and learning from each other. While I am visiting the centre I hope not to influence the children's play, but to observe it as it happens. After I have completed these observations I will interview two of the teachers at your centre to gain some insight into their knowledge of peer learning. It is hoped that the knowledge gained from this study will add to our understanding of how children learn from each other and how teachers can best support this type of learning.

Data will be stored in a locked cabinet in my office for a period of five years and then will be shredded and destroyed. A copy of the project findings will be made available to teachers and parents on completion of the project. I will provide a summary of the findings in written form to the teachers who will distribute this to you after the project is completed. The identities of all teachers and children will be kept confidential in any reporting of the data collected.

Participant involvement

As I hope not to disturb the children in their play, the only involvement they will have is if I briefly chat with them about what they have been doing with their friends. I will ask them before I observe them if I can make notes about what they are doing and also if I can talk with them about their play. I will talk with them wherever they happen to be playing in the centre at the time. I also need to gain your written consent for me to observe your child and talk with them and I will only do so if you give your consent.



Participant's Rights

You are under no obligation to accept this invitation on behalf of your child. If you decide to participate, you have the right to:

- withdraw your child from the study up until the data is all collected
- 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 the project findings when it is concluded.

Project Contacts

Please do not hesitate to contact me or one of my supervisors at any time if you have questions about the project. Our contact details are as follows:

Penny Smith
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"This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 09/53. If you have any concerns about the conduct of this research, please contact Dr Karl Pajo, Chair, Massey University Human Ethics Committee: Southern B, telephone 04 801 5799 x 6929, email humanethicsouthb@massey.ac.nz."

Appendix G: Consent form –parents



Massey University
COLLEGE OF EDUCATION
Te Kōwhiri o Te Mātauranga

SCHOOL OF ARTS, DEVELOPMENT
AND HEALTH EDUCATION
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• Health Education
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The role of peers in children's learning

PARTICIPANT CONSENT FORM FOR PARENTS/GUARDIANS

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 to my child participating in this study under the conditions set out in the Information Sheet and understand that my child will also be asked for their assent

Signature: _____ Date: _____

Full Name - printed _____

Relationship to child: _____

Child's name: _____

Child's age: _____