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BEST EVIDENCE SYNTHESIS

Characteristics of professional development linked to enhanced pedagogy and children's learning in early childhood settings: Best Evidence Synthesis

July 2003

Characteristics of professional development linked to enhanced pedagogy and children's learning in early childhood settings:
Best Evidence Synthesis

October 2003

This report is one of a series of best evidence syntheses commissioned by the Ministry of Education. It is part of a commitment to strengthen the evidence base that informs education policy and practice in New Zealand. It aims to contribute to an ongoing evidence-based discourse amongst policy makers, educators and researchers.

The best evidence synthesis approach is being developed in collaboration with researchers. It draws together in a systematic way the available evidence about what works to improve education outcomes, and what can make a bigger difference for the education of all our children and young people.

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Best Evidence Synthesis

Report prepared for the
New Zealand Ministry of Education

Linda Mitchell and Pam Cubey

July 2003

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EXECUTIVE SUMMARY

This synthesis addresses the question of:

> *"What constitutes quality professional development as it relates to learning opportunities, experiences and outcomes for children within diverse early childhood provisions?" (Ministry of Education, 2002).*

The best evidence synthesis is derived from research that provides strong evidence of linkages to learning opportunities, experiences and outcomes for children. An important focus of the work is professional development in support of educational practice that is inclusive of diverse children, families and whänau. Specific emphasis is on evidence related to learning opportunities and outcomes through the provision of professional development for Mäori children, Pasifika children and children from low socio-economic families. An extensive search was made for New Zealand and international material through library databases and contact with researchers and professional development providers. Research was critiqued and selected if it met yardsticks for quality evidence. Cross-study analysis was undertaken and the evidence integrated to address the research questions.

- The synthesis findings of the impact of professional development have been summarised into three categories: enhancing pedagogy; contributing to children's learning; and building linkages between early childhood education settings and other settings. Eight characteristics of quality professional development are derived from evidence of the processes and conditions operating in the programmes under review. Structural conditions supporting quality professional development are also discussed. Recommendations are made for further research and research accessibility.

Enhancing pedagogy

- The principles and strands of Te Whäriki form the framework of the curriculum in early childhood services in New Zealand. Effective pedagogy requires education and care to be integrated, with learning, development, and experiences for children inter-related. Learning goals are broad and include knowledge, skills, and dispositions. Evidence about effective pedagogy shows the need for teachers/educators to understand children's experiences, and focus on children's interests and understanding. Building linkages between settings, especially home and early childhood service, by sharing curriculum and learning aims supports such understanding and shared experiences. Reciprocal interactions within early childhood settings make a key contribution to children's learning and wellbeing. Effective pedagogy is linked to teachers/educators who are involved, responsive and cognitively demanding, and who encourage "sustained shared thinking" where adults and children co-construct an idea or skill.
- There is evidence that professional development can make significant contributions to enhancing pedagogy in early childhood settings in three key areas: challenging teachers/educators' beliefs and assumptions from a deficit view so that the knowledge and skills of families and children are acknowledged and built on; collecting and analysing data

from the participants' own setting; and supporting change in participants' interactions with children and parents.

Challenging deficit assumptions and supporting inclusive practice

- Deficit assumptions prevent teachers/educators from understanding and appreciating children's and parents' diverse skills, experiences and knowledge and drawing on these to extend children's thinking and encourage learning strategies. Deficit assumptions are associated with low expectations for children and families and hinder teachers/educators' ability to question their own pedagogical practice and to support children's well being, sense of belonging, and contribution.
- There was evidence of deficit assumptions associated with ethnicity, socio-economic status and child's age. These included New Zealand evidence of assumptions of limited literacy experiences in the lives of kindergarten children from low income and ethnically diverse families, low expectations for new entrants in schools in Mangere and Otara, assumptions that families of new entrant school children in Otara and Mangere would not return "home readers", and Swedish evidence of some limited understanding of the potential to educate toddlers. Deficit assumptions are likely to be more prevalent when the backgrounds (e.g., ethnicity, socio-economic status, language) of children and families are different from those of the educator, or the educator does not know the child well. Babies and toddlers may be harder to understand well because of their inability to communicate verbally.
- Professional development can help challenge deficit views of the child and family and support change in pedagogical practice. Conditions that supported such shifts in thinking and practice are: collection and analysis of data from within the participant's own setting; exposure to different viewpoints in the data analysis; and information about alternative practices.
- Professional development supported inclusive practice when it was based on analysis of data obtained through close observation of relationships, investigation of families' views and experiences and/or formative assessment, and when it supported pedagogy that built on children's knowledge and experiences and strengthened linkages with home.

Data collection and analysis

- Professional development approaches linking to effective pedagogy and children's learning in early childhood settings involved participants in collection and analysis of data from within their own setting. This can be a powerful mechanism to engage practitioners in work that is meaningful to them, offer useful evidence on pedagogy and alternative viewpoints, create challenges to assumptions, and help practitioners to make assessments and evaluations. Focused professional development is able to support practitioners to collect and analyse data for these purposes. The studies in this synthesis showed a variety of data collection tools being developed and/or used. These included the construction of action research tools to assist with data collected from different sources (parents/whänau, children, adults, peers), the analysis and use in planning of audio and video recordings of verbal and/or other interactions, focused observation of learning and teaching processes, use of reflective questions for critical discussion, and assessment of children's skills on school entry.

- Professional development advisers or researchers gathered data themselves for later discussion and analysis with participants, or assisted participants in developing their own analytic and data collection tools. Analysis of data was supported when an outside professional development adviser or researcher was available to challenge and offer alternative views and theoretical ideas.

Supporting change in pedagogy

- There are common features in professional development associated with changed pedagogical practice. The professional development offers theoretical and content knowledge, and knowledge about alternative practice, generating deeper or new understanding. Children's experiences and adult interactions related to these within the participant's own service are a focus. In the studies reviewed, those participants who were not qualified and had less theoretical understanding or practical experience needed a longer timeframe to benefit from professional development focused on pedagogy.
- Critical analysis of data and discussion is an essential part of the professional development programme. Planning and action followed analysis, and this cycle was continued in an ongoing way.
- Professional development aimed at influencing participants' interactions with children can assist participants to become better aware of children's ideas and theories, helping them to extend children's thinking and promote learning dispositions. Four programmes reviewed in the synthesis demonstrated changes in participants' interactions: a) in scaffolding children's learning; b) in the adult role of mediating between the child's experience and the environment; c) in the way participants dealt with children's life questions; and d) in adult engagement and child involvement. Another showed changes in teachers' behaviour management. The results apply across a range of early childhood settings and with children from different socio-economic backgrounds.

Contributing to child outcomes

- Evidence of various types of outcomes for children arising from teachers/educators' participation in professional development programmes was found. In two professional development programmes, there was evidence of linkages with Te Whäriki outcomes for children. One of these demonstrated change in child initiated communication, and transcendence by the child (expanding or going beyond the here and now). The other demonstrated change in child involvement. Other studies examined professional development linked to literacy, mathematical understanding, and scientific understanding.
- There is evidence that some teachers/educators have limited understanding of literacy, mathematics, and scientific learning, and of their role in extending learning in these areas. Although the content of the professional development was different for each learning area, characteristics of professional development leading to outcomes for children and changed pedagogical practice related to these areas, had some common features.
- Professional development explored and extended participants' understanding and beliefs, helping them appreciate the strong role they could play as teachers/educators within that learning area. Specific practice was identified. Content knowledge was threaded into knowledge about effective pedagogy. Teachers/educators were encouraged to build on existing opportunities through activities and conversations, rather than plan a structured

programme. Data collection and analysis was a core feature. Professional development encouraged teachers/educators to provide an environment to support the learning area, e.g., for literacy, provision of a "print enriched environment" in which a large variety of books were attractively displayed and accessible to children, print was visible on many surfaces at a child's level or children's levels, and print was an everyday enjoyable and useful part of life at the early childhood centre.

- Outcomes for children were related to the focus of the professional development. In the literacy programmes, two studies showed positive impacts on school measures of literacy for children 12 months after they started school. Another study showed an increase in children's comments during book reading. Some indicated changes in adults' interactions with children, such as in style of reading story books and stimulating emergent writing, and changes in teachers/educators' confidence in the learning area. In a mathematics professional development programme, teachers became more aware of each child's skill level and were able to offer activities providing a suitable level of challenge.

Building linkages between early childhood settings and other settings

- Integrated action between early childhood services and home, early childhood services and school, and the key players in children's lives enables teachers/educators to draw on family and cultural perspectives and assist in creating coherence and continuity in children's lives. Co-ordination and matching is harder for early childhood teachers/educators when the children and families in their early childhood services are from different cultures from the teachers/educators or have different experiences from their own.
- There is powerful evidence that professional development aimed at strengthening linkages between parents and teachers/educators can contribute to increased learning opportunities for children, changed perceptions by teachers of parents' knowledge and skills, changed perceptions by parents of their roles as teachers/educators, and greater understanding of children's experiences and interests.
- There was one study involving joint professional development on language, learning and literacy for primary and early childhood teachers. Joint professional development holds promise that collaboration through professional development will enable teachers in the two sectors to build shared understandings that lead to greater integration of experiences for children between schools and early childhood services. A caveat is that there should be no downward shift that compromises children's learning in the early childhood curriculum.

Eight characteristics of effective professional development

- Characteristics of effective professional development synthesised from the evidence of professional development linked to effective pedagogy and children's learning are presented in eight major categories. Table 1 summarises these characteristics to present an overview. In addition, the duration and intensity of professional development, characteristics of professional development participants, the professional development adviser, and organisation of the service are influential in supporting or hindering the ability of participants to learn from professional development and change their pedagogical practice.

Table 1

Characteristics of effective professional development linked to enhanced pedagogy and children's learning in early childhood education settings

The professional development incorporates participants' own aspirations, skills, knowledge and understanding into the learning context	**The professional development provides theoretical and content knowledge and information about alternative practices**	**Participants are involved in investigating pedagogy within their own early childhood settings**	**Participants analyse data from their own settings. Revelation of discrepant data is a mechanism to invoke revised understanding**	**Critical reflection enabling participants to investigate and challenge assumptions and extend their thinking is a core aspect**	**Professional development supports educational practice that is inclusive of diverse children, families and whānau**	**The professional development helps participants to change educational practice, beliefs, understanding, and/or attitudes**	**The professional development helps participants to gain awareness of their own thinking, actions, and influence**
The professional development takes on board participants' own aspirations, skills, knowledge, and understanding, and recognises the context for learning. This is a starting point: the programmes introduce new ideas and provide opportunity for participants to question their experiences and views, and not simply validate them.	Theoretical and content knowledge related to effective pedagogy is provided. This may be generic or content specific, such as generic areas of co-constructing learning, scaffolding, learning dispositions as outcomes of Te Whäriki, and specific areas such as early literacy, mathematical and scientific understanding, creativity. Content knowledge is integrated with pedagogical knowledge. The theoretical and content knowledge expands participants' knowledge base. Information and knowledge about alternative practices are provided.	The programme involves participants investigating real life examples of pedagogy within their own settings. Investigative methods, such as action research, are useful. Investigation by participants in issues within their own setting (e.g. interactions and behaviour) encourages work on issues that are important to participants and that make a difference to their own pedagogical practice. An external professional development adviser or researcher engages in the investigation.	A key process in contributing to revision of assumptions and understanding is "creating surprise through exposure to discrepant data" from the participant's own early childhood service. Understandable data that reveals "pedagogy in action" and others' views is helpful in these investigations. Useful approaches to data collection include collection and analysis of video and audio-tape recordings, observations, surveys of others' views, and assessments of learning. The professional development programme supports data collection and analysis.	Critical reflection involves teachers/educators in investigating and challenging their assumptions. This in turn encourages insights and shifts in thinking. This is particularly valuable in challenging deficit views associated with ethnicity, socio-economic status, child's age, parental knowledge, and gender. Some conditions that encourage critical reflection: 1) collaboration with others and being exposed to their views. These views include views of colleagues, professional development advisers, parents, and children; 2) using deeper or different theoretical understanding; 3) teachers/educators thinking about their own thinking, e.g. through use of journals and diaries.	Professional development supports practice that is inclusive of all children, families and whänau. Its focus is on pedagogy that understands, values, builds on and extends the competencies and skills that every child brings to an early childhood setting. It supports participants to work closely with families so that both are better informed about and able to extend the child's experiences and learning. Professional development in support of inclusive practice helps participants analyse data obtained through close observation of relationships between children and people, use formative assessment, and offer curriculum differentiation.	Professional development is linked to tangible changes in pedagogical interactions and this in turn is associated with children's learning in early childhood settings. The professional development helps participants to change educational practice, beliefs, understanding, and/or attitudes. Participants are encouraged to investigate ideas and practices that stand in the way of an equitable society. Participants may become aware of ways in which they disempower or limit groups or individuals.	The professional development assists participants to gain greater awareness and insight into themselves, and a stronger appreciation of the power of their role as educators.

Mitchell, L. and Cubey, P. (2003) *Characteristics of effective professional development linked to enhanced pedagogy and children's learning in early childhood settings: Best evidence synthesis.* Wellington: Ministry of Education.

Structural features of effective professional development

Professional development programmes

Duration and intensity

Professional development programmes focusing on abstract concepts, complex theoretical understandings and interactions across many contexts, such as scaffolding learning, mediating learning experiences and integrating observation, planning and assessment seem to require long timeframes (a year or more) for new understandings and ways of working to become embedded in pedagogy. Professional development focusing on discrete goals, such as behaviour management, telling stories or broadening writing opportunities may be effective in a shorter time (1 – 4 months).

Time for professional development may be spread and energy dissipated when there are lengthy periods between professional development sessions. This may slow change. Time taken up with "finding a goal" also spreads out the time needed for professional development, although the process of finding a goal may help ensure the professional development meets needs of practitioners. Intensive opportunities to practice may help sharpen the intensity and effects of the programme.

While opportunities to practice are important, this does not imply a lack of value in one off seminars and conferences, which may play a role in "awakening interest" or ongoing reflection being challenged through exposure to new theoretical ideas and views. It is unlikely however, that such opportunities on their own would directly change practice in such a way as to impact on outcomes for diverse learners.

Involvement of professional development advisers and researchers

Professional development advisers and researchers play key roles in establishing goals, observing teachers/educators, offering knowledge about alternative practice, giving feedback and planning. Intensive input seems necessary at the start of a programme, while at later stages minimal support only may be needed. However, an enduring role is for the professional development adviser to critique and challenge pedagogy.

Bringing new practitioners on board without losing momentum and focus for others is a challenge for professional development in settings where there is a high turnover of teachers/educators.

Whole service approach

Taking a whole centre approach and working with all staff in a service is likely to make it easier for them to work together from common understandings and appreciation. However, this does not imply that professional development with only some of the service's teachers/educators is not beneficial, especially if these participants are able to use their knowledge and understanding to mentor others.

Participants

Levels of training and qualifications of participants influence time necessary to make changes to pedagogical practices, beliefs, and understanding. Professional development needs to start from

participants' own aspirations, skills, knowledge, and understanding. This is more difficult when a group of participants has different needs and goals. In order to provide challenge and stimulation for all participants, there may need to be differentiation within the programme and support for more highly qualified practitioners to become mentors.

While lack of motivation is a barrier to change, motivation may be enhanced through quality professional development and programmes that have meaning for practitioners, such as action research within their own setting. It seems most productive to attend to these quality issues rather than motivational issues.

Professional development adviser

The processes and experiences that make for effective professional development require highly skilled, knowledgeable, and critically aware professional development advisers. The professional development adviser needs to be able to work with practitioners through processes described in the framework: *Characteristics of effective professional development.* Professional development advisers need:

- strong theoretical, content, and pedagogical knowledge;
- ability to collect and analyse data and teach data collection and analysis skills;
- excellent communication and relationship skills;
- to be reflective thinkers and practitioners themselves;
- to be able to mentor, model, provide feedback, challenge, and model reflective thinking;
- to understand and be able to challenge practices and ideology that disempower interests of children and families; and
- to practise effective pedagogy themselves.

Organisation of the service

Features within the service may act as constraints or support participants in implementing pedagogic change and processes of data collection, analysis, and collaborative discussion.

Staffing levels

Good staffing levels (ratios and group size) provide conditions for staff to form close and reciprocal relationships, and work with individuals and small groups of children, as well as time to work collaboratively with families and other community services. Structural re-organisation can sometimes enable teachers/educators and children to work together in smaller groups, but this presupposes an adequate level of staffing to start with. Poor staffing levels hinder the ability of practitioners to respond to diversity and offer a differentiated curriculum for all children.

Tools and support to assist with analysis, evaluation, and planning

It is valuable for practitioners to have access to a range of tools and conditions to support analysis, evaluation and planning, given the importance of these for effective pedagogy. On a practical level this means:

- physical conditions and materials to enable documentation and discussion of the nature and purpose of teaching and learning. These could include materials for making and keeping observations and records, tools such as cameras, audio-tape recorders, video-tape recorders, scanners, photocopiers, computers, and an adult work environment offering space and tables of adequate size and height to lay out documentation;
- a print budget;
- access to professional development advisers who are able to work in the centre as well as with wider groups; and
- a research community that engages with teachers in useful discussion of research and thinking.

Conditions within the early childhood centre to support effective pedagogy

If early childhood education centres are to be learning communities for teachers as well as children, parents, and others, there need to be opportunities within the work environment for reflection, experimentation, documentation, and planning. This means:

- centre management who value and support ongoing professional development;
- teachers/educators who place a high priority on their professional growth; and
- teachers/educators having time and effective opportunities during the working week for reflection and discussion'
- meaningful professional development provided by professional development advisers.

Further investigation

This synthesis has shown a number of areas where evidence is lacking or meagre, and in which research would be valuable. The following recommendations for research are discussed in the conclusion to this synthesis.

Linkages to outcomes for children

- Research evidence on professional development linked to outcomes for children within the principles, strands and goals of Te Whäriki.
- Longitudinal research of teachers and children to provide evidence of conditions under which effective pedagogy and outcomes for children are sustained, following professional development.
- Expansion of the knowledge base about Pasifika pedagogy and content knowledge to inform professional development approaches in the Pasifika sector.

Partnerships

- Further investigation of professional development approaches to strengthening partnerships between home and early childhood setting, including partnerships with extended family members, where they play a key role in children's lives.

- Investigation of professional development aimed at strengthening partnerships between primary and early childhood teachers, including ways to build primary teachers' understanding of Te Whäriki.
- Professional development aimed at strengthening linkages with community organisations, including health and welfare organisations.

Structural features

- Investigation of processes that work well for participants in professional development programmes from services where there is a mix of qualified and unqualified teachers/educators, including ways to offer a differentiated curriculum development programme and assist better qualified teachers/educators to become mentors.

Service features

- Some gaps in evidence for specific services and teachers/educators working with specific age groups and characteristics were clear. Investigation of professional development programmes for teachers/educators in köhanga reo, home-based education and care, Pasifika services, for teachers/educators working with toddlers and babies, and for teachers/educators working with children with special needs would be of value.

Research accessibility

- Practitioners need to have access to useful research evidence and information on workable approaches to building investigation and analysis into their pedagogical practice, and working in partnership with researchers and professional development advisers. Establishment of a central clearing house for people engaged in action research in early childhood settings would help disseminate ideas and approaches.

INTRODUCTION

This synthesis brings together and analyses research evidence about professional development for teachers/educators in the early childhood education sector. The focus is on evidence about features of quality professional development related to children's learning opportunities, experiences and outcomes (social and dispositional as well as cognitive). Attention is paid to contextual issues, and the influences of culture, ethnicity and language. There is an emphasis on evidence related to the characteristics and impact of provision of effective professional development for learning opportunities of Mäori and Pasifika children, and of children in low socio-economic circumstances. The synthesis analyses implications for strategic and operational policy initiatives and identifies questions and gaps where further research is needed.

The synthesis was commissioned in 2002 by the Ministry of Education's Medium Term Strategy Policy section.

Section 1 describes the approach to the search for evidence and development of an analytic framework.

Section 2 synthesises evidence related to *professional development and effective pedagogy*. Our starting point was research evidence about effective pedagogical practice in early childhood education, since this evidence indicates the features of adult interactions and contexts that make the greatest contribution to the development of children's competencies. The Competent Children study in New Zealand and the Effective Pedagogy in the Early Years study in the UK provided recent substantive evidence about pedagogical practice, and these were a useful frame for our synthesis. Evidence about the impact of professional development on teachers/educators' interactions with children is examined.

Section 3 synthesises evidence related to *professional development and curriculum*. This is in three parts:

- Theoretical understanding and pedagogical content knowledge. There is some evidence that teachers/educators need to have sound theoretical knowledge and pedagogical content knowledge in order to be confident in working with Te Whäriki and extending children's understanding of their worlds. Professional development that incorporates these aspects is described in relation to particular programmes.
- Professional development and literacy. A strand of evidence showing linkages between professional development programmes and children's literacy development is examined in the context of evidence about pedagogical approaches and contexts for literacy development.
- Professional development and mathematical and scientific learning. Research studies showing how children's mathematical and scientific learning can be extended in early childhood education and linkages between professional development and mathematical and scientific learning are examined.

In Section 4, we review evidence on the impact of *professional development in enabling teachers/educators to draw on individual and cultural perspectives* so that linkages between settings experienced by children are strengthened. Evidence about social and cultural contexts and effective professional development approaches in settings for Mäori children, and Pasifika children, and in building linkages between home and early childhood setting, and home and school are examined. Professional development programmes described in sections 2 and 3 which challenged deficit assumptions and/or inequities are highlighted.

The concluding section 5 examines and draws together evidence about characteristics of effective professional development approaches and structural features of professional development. It identifies gaps where further research evidence is needed and recommends measures to make research evidence more accessible to practitioners.

APPROACH TO THE RESEARCH SYNTHESIS

Rationale for the synthesis

This best evidence synthesis on characteristics of professional development linked to enhanced pedagogy and children's learning in early childhood settings was commissioned in 2002 by the Medium Term Strategy Policy section of the Ministry of Education. It is one of a series of syntheses intended to bring together relevant research related to children's learning opportunities and outcomes. The synthesis is to be used "to generate indicators of the health of the system for the early childhood sector. It will also inform the decisions made about the ongoing provision of professional development across the early childhood education sector" (Ministry of Education, 2002, p.2).

The brief called for a focus on evidence about what constitutes quality professional development as it relates to learning opportunities, experiences, and outcomes for children within diverse early childhood education provisions. While the primary focus of the work was to be the Aotearoa New Zealand context, there was an expectation that the synthesis would include international evidence about what constitutes quality professional development. The influence of culture, ethnicity, and language was to be an important focus of this work. The brief called for specific emphasis on the evidence related to Mäori and Pasifika as well as low socio-economic status children's learning opportunities and outcomes through the provision of effective professional development. This was to be a central component of the work (Ministry of Education, 2002).

The best evidence synthesis is derived from consideration of research that links to learning opportunities and outcomes for children. The approach brings together and integrates qualitative and quantitative evidence.

Questions addressed by the synthesis

The synthesis aims to contribute to a comprehensive database for educational policy development on what works in professional development in early childhood education. An overarching question is:

- What constitutes quality professional development as it relates to learning opportunities, experiences, and outcomes for children within diverse early childhood education provisions?

Specific questions are:

- How does the diversity of contexts, especially in relation to the range and diversity of staffing, impact on the provision of quality professional development in the early childhood sector?
- What is needed to ensure effective professional development in support of educational practice that is inclusive of diverse children, families, and whänau?

- What is the evidence about effective pedagogy and the policies, approaches, and conditions that enable such pedagogies to be delivered within the framework of effective professional development?
- What is the evidence about effective professional development that is explicitly linked to positive outcomes for children?
- What are the policy and practice areas in the field of professional development where development and research are needed?

Best evidence synthesis approach

The best evidence synthesis approach is a systematic literature review strategy, having explicit and transparent methods, and being accountable, updateable, and replicable (Oakley, 2002). The approach requires an extensive search for relevant research evidence, critique of the quality of the evidence, followed by analysis, and integration of the material to address the issues under consideration. Boaz, Ashby, and Young (2002, pp.4-6) described seven standards in systematic reviews:

- using protocols to guide the process. Protocols are likened to action plans, which outline the different stages of the process, and make it possible for the review to be repeated;
- focusing on answering specific questions;
- seeking to identify as much of the relevant research as possible;
- appraising the quality of the research included in the review;
- synthesising the research findings in the studies included;
- aiming to be as objective as possible about research to remove bias; and
- updating in order to be relevant.

These standards were followed in this synthesis.

Using protocols to guide the process

A synthesis plan was developed in response to the Ministry of Education's Request for Proposals, and an outline for the synthesis was further developed in consultation with the Ministry of Education after our initial search for evidence.

Focusing on answering specific questions

The Ministry of Education provided specific objectives for the synthesis, which enabled the purpose to be clear. Ministry staff critiqued draft forms of the synthesis, and suggested more emphasis on some objectives. This led us to apply further analysis to the evidence, and to "unpack" the evidence, so that specific objectives could be addressed in more depth.

Seeking to identify as much of the relevant research as possible

A variety of approaches were taken to searching for and selecting evidence so that we could capture significant current and landmark work within New Zealand and internationally. This included evidence available on standard library databases and evidence that was not on databases but held in universities and with providers of professional development.

NZCER limited its search to research post-1989 and landmark research from 1970. Landmark research was identified through citation, discussion with the Ministry of Education and professional colleagues, as outlined below, and NZCER's own knowledge.

NZCER searched the following databases to gather relevant evidence:

- Catalogue — Library database;
- INNZ — articles in NZ journals;
- ERIC — U.S. Education database;
- British Education Index;
- Australian Education Index;
- Informit (education, family, indigenous and public service databases);
- Ingenta (was UnCover);
- Te Puna — books held by NZ libraries;
- OCLC First Search;
- EdResearch Online — ACER Educational Research database;
- ACER Education Research Theses database; and
- Australian Digital Theses database.

Libraries contacted within New Zealand were: Ministry of Education; ECD; Wellington College of Education; Colin Bailey Library (Victoria University Education Department); colleges of education libraries; and university libraries. We also contacted the Scottish Council for Research in Education.

In order to access unpublished research evidence, NZCER made written[1] or telephone contact with the following individuals and providers:

- professional development providers in New Zealand (list received from Ministry of Education);
- national organisations supporting early childhood education services in New Zealand (list received from Ministry of Education);
- researchers within New Zealand working in early childhood education; and
- researchers in UK, Canada, Belgium, Denmark, Sweden, Australia, Scotland, and the US known to be working in the field.

Appraising the quality of the research used in the review

Both qualitative and quantitative research that provided evidence of links to outcomes (dispositional, social, and cognitive) was sought. In order to apply the criteria of "best evidence" to our synthesis, we considered the material found against the following yardsticks:

[1] Letter attached as Appendix 1.

- *Strong evidence linked to outcomes for children.* The evidence demonstrates valid linkages between professional development and outcomes for children, quality of teaching, and children's learning opportunities and experiences. Characteristics of the participants, early childhood settings, and children are described. The professional development is described, including details of timeframe, programme, tools, and methods. Research methods, data analysis, and findings are detailed.
- *Strong evidence about professional development but with little information about outcomes for children.* The evidence may be about contexts and processes for teaching and learning and teachers/educators' knowledge and beliefs but does not make linkages to outcomes. Characteristics of the participants, characteristics of the early childhood setting, and characteristics of the children are described. The professional development is described, including details of timeframe, programme, tools, and methods. Research methods, data analysis, and findings are detailed.
- *Data-based evidence, with some gaps.* This evidence would have some gaps in the detail provided but could be linked with outcomes for children, the quality of teaching, contexts and processes for learning or teachers/educators' knowledge and beliefs.
- *Commentary and opinion.*

New Zealand and international evidence meeting the yardsticks for the first and second categories, strong evidence, was used in the synthesis. New Zealand based and international evidence meeting the yardsticks for the third category was included if it was useful in providing insight, strengthening a view, or filling a gap within the jigsaw of the synthesis. Commentary and opinion was not included.

Synthesising the research findings

Researchers at the ESRC UK Centre for Evidence Based Policy and Practice (Boaz et al., 2002; Pawson, 2001) have summarised three main approaches to the synthesis of evidence: meta-analysis; narrative review; and realist synthesis.

- Meta-analysis uses statistical techniques to bring together the conclusions for studies that have quantitative outcome measures. These can be illuminated by specific case studies.
- Narrative review takes into account the methodological quality of studies, and "looks at similarities and differences between studies and their outcomes" (Boaz et al., 2002, p.6). It considers a range of variables, such as programme, target group, context, and implementation details. It may use tables to highlight systematic information for the review.
- Realist synthesis looks at the programme mechanisms that trigger change, rather than the programme itself. Pawson (2001, p.4) described realist synthesis as taking a "'generative' approach to causation". The take up of the programme by the participant depends on their interpretation of the programme, and the context. Realist synthesis does not offer a recipe for the "best" programmes, but develops a theory about what kinds of programme work, in what respect, in what contexts, and for what subjects. It also uses studies of programmes associated with negative outcomes to analyse underlying mechanisms in these cases.

An approach using features from both narrative and realist synthesis linked to outcomes was favoured in this synthesis. There was careful consideration of variables and comparison of

professional development approaches and outlines, and emphasis on social inclusion, context, and conditions. For easy reference, a summary of the professional development programmes and research evidence described in this synthesis is set out in Appendix 2. We used educational theory (see next section) as a framework to help analyse programme mechanisms. This was particularly useful in helping us analyse the underlying premises within professional development approaches as they related to diverse participants and children. We drew on two syntheses that were published in January 2003 by the Ministry of Education on related areas: "Quality teaching: early foundations" (Farquhar, 2003); and "The complexity of community and family influences on children's achievement in New Zealand" (Biddulph, Biddulph, & Biddulph, 2003).

In order to make meaning accessible, we used specific examples and clear language in our synthesis and writing. The characteristics of the professional development approach, of professional development participants, and of the children and context of the early childhood setting are provided in some detail in each description of research evidence in order to make explicit the features that were under analysis.

Theoretical issues

Underpinning professional development approaches are premises, or theoretical views about teaching and learning. These are influential in shaping the way teachers/educators approach issues of diversity, and are pertinent in considering the influences of culture, ethnicity, language, and socio-economic status. The brief called for specific emphasis on the evidence on children's learning opportunities and outcomes, related to Mäori and Pasifika, as well as low socio-economic status, through the provision of effective professional development.

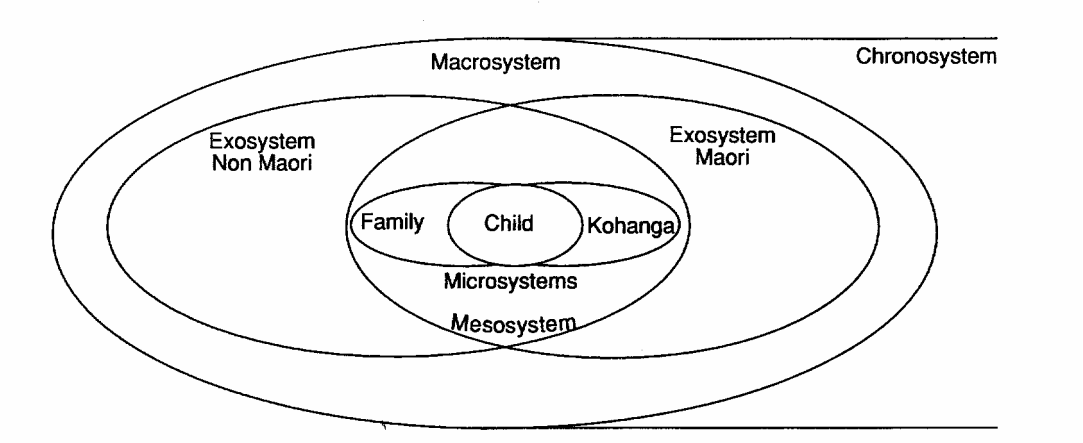
Theoretical views of teaching and learning

Bronfenbrenner (1979) proposed an ecological model of human development, in which he described the child's learning environment as extending beyond immediate settings of home, and early childhood service (mesosystem). The child as learner is at the centre, and the interactions with significant others within the immediate settings and the relationships between the settings, e.g., home and early childhood service, have a powerful influence on the child's capacity to learn and wellbeing. Enveloping ecological systems exert a further influence, and include the community, mass media, social networks, and the world of work (exosystems). A further layer of influence arises from the macrosystem of cultural and ideological beliefs and values. The interrelationships between these systems influence the child's learning environment.

Royal Tangaere (1997a, pp.66-67) picked up Bronfenbrenner's and Tharp's (1989) emphasis on the importance of culturally compatible cross links between the child's microsystems of home and the educational setting, to optimise the language and social development of the child. She proposed the following model to demonstrate the overlapping of the two world views of Mäori and Päkehä.

Figure 1

Overlapping world views of Mäori and Päkehä



Both exosystems impinge on the microsystems of the child's whänau and the köhanga reo context. For the köhanga reo and the Mäori whänau, the child was the link; and because the kaupapa of the köhanga reo required commitment from the entire family to revitalise the Mäori language and to support the köhanga, the two settings were compatible. Therefore one could assume that positive learning would occur, not only for the child, but also for the family and the köhanga reo (Royal Tangaere, 1997a, p.67).

Royal Tangaere argued that educational success for Mäori children depends on early childhood centres and schools providing an environment that is culturally compatible with the family context.

These theoretical positions support an approach to education where teachers/educators, children and families work together to "scaffold" or "co-construct" learning. In scaffolding of learning, adults and skilled peers support and challenge children to build new competencies and skills, and actively construct learning in their "zone of proximal development" (Vygotsky, 1978). The adult makes demands of the child as learner that are challenging, and ensures support that is appropriate to the child's needs. "Co-constructing learning" acknowledges that the child is an active constructor with others, of knowledge and of making meaning of the world. Both children and adults have an active role in the pedagogical process. Co-construction recognises the child as part of society and culture, a social actor, with rights and agency. Pedagogical practices that flow from these approaches build on and welcome the knowledge and skills of all players, and acknowledge the influence of relationships and interactions, and the social and cultural context in which learning occurs (Cannella, 1997; Dahlberg, Moss, & Pence, 1999; Grieshaber & Cannella, 2001).

At its basis is an empowering theory of education, underpinned by a view that children and families have strength and expertise that can be built on or extended. It contrasts with *deficit* theory where children are viewed as "deficit in readiness, motivation, experience, language and/or understanding", and with *difference* theory, which recognises cultural differences and discontinuities for some children in moving from their own culture to the culture of the educational institution, but imposes the dominant culture on minority children (Biddulph et al., 2003).

Similarly, an empowering approach to working with families implies "that parent knowledge of their specific child is at least as valuable as staff's professional and expert knowledge of children in general" (Hughes & McNaughton, 2002, p.18). For example, the Pen Green approach to working with parents (Whalley & the Pen Green Centre Team, 2001) aims to develop an effective dialogue with parents about their children's learning, to empower rather than de-skill, to develop a greater understanding of how parents encourage their children at home, to compare and contrast the styles that nursery staff and parents adopt in working with children, and to produce materials to assist parents to get actively involved in recording and understanding their children's development.

Empowering approaches are a particular challenge for teachers/educators who are different from the child, or do not know the child well. Farquhar (2003, p.11) noted key issues of difference from adult educators for the early childhood age group include "ethnicity, language background, family background (including parental income, resources and parental education) and gender". As Adler (2001, p.154) stated,

> *Teachers seek information from both parents and the children in their classes about their lives, beliefs, and experiences, then reflect back to each through their own cultural lenses. The lenses reflect the teachers' own cultural awareness, race, class, gender, ethnicity, religion, and belief systems.*

Adler argued that teachers/educators can provide a conduit to a more sensitive and equitable multi-cultural society of the future, by recognising and appreciating cultural lenses, and encouraging students to share perspectives, collaborate and make opportunities to have dialogue about race and ethnicity. Knowledge of the experiences of others can lead to greater understanding of diversity and recognition of new possibilities for all children.

Grieshaber and Cannella (2001, p.11) have described two methods that can help teachers/educators question perspectives that privilege particular knowledge and particular groups.

> *Deconstruction reveals underlying values, biases and beliefs that have generated particular views.*
>
> *Genealogies, or genealogical critiques, are "historical analyses about how particular forms of reasoning and 'telling the truth' of the present involved shifts in the power relations and kinds of knowledge central to establishing a particular discourse" (Popkewitz & Brennan, 1998, p.15).*

These kind of techniques (and others) that can assist in revealing biases and marginalised knowledge, may be a focus of professional development that helps teachers/educators to better understand diverse children.

Within an empowering model of education, teachers/educators understand and appreciate each child, and build on and extend their skills and competencies. An empowering model offers a useful frame for evaluating professional development approaches. In considering evidence about characteristics of professional development in relation to diversity of children and communities, it

is useful to examine what approach to pedagogy is encouraged by the professional development, and the extent to which the professional development helps participants to step outside their own perspectives and understand the perspectives and experiences of others.

Adult learning theory is another useful frame for making sense of evidence about characteristics of professional development and their linkages to effective pedagogy and children's learning.

There are few differences between adult learners and child learners in terms of the learning process. This point was made by Jordan (1999) who drew on notions of scaffolding and co-construction in the learning of participants in her professional development programme, in a similar way to those being used in the early childhood setting.

Brookfield (1996) contended that the following four major preoccupations for post-war researchers of adult learning represent an "espoused theory of adult learning". These are: self-directed learning; critical reflection; experiential learning; and learning to learn.

Self-directed learning highlights ways in which adults set their own learning goals, locate resources, decide on learning methods, and evaluate their progress – how adults take control of their own learning. Merriam and Brockett (1997) noted that the emphasis on self-directed learning has arisen from work by Tough (1979) who found in a sample of 66 adults that over two-thirds of learning activities were planned, implemented, and evaluated primarily by the learner. Further replications have supported this conclusion. More recently, researchers in adult education have argued that the concept of self-directed learning needs to take into account social contexts, and characteristics of the learner. For example, self-directed learning may involve co-operative learning and collective activities.

Merriam and Brockett (1997, p.141) identified three major goals of self-directed learning as:

- enhancing the ability of adults to be self-directed in their learning;
- fostering transformational learning (change in the way we see ourselves and the world); and
- promoting emancipatory learning and social action.

Critical reflection focuses on three inter-related processes:

> *(a) the process by which adults question and then replace or reframe an assumption that up to that point had been uncritically accepted as representing common sense wisdom; (b) the process through which adults take alternative perspectives on ideas, actions, forms of reasoning and ideologies previously taken for granted; (c) the process by which adults come to recognise the hegemonic aspects of dominant cultural values and to understand how self-evident renderings of the "natural" state of the world actually bolster the power and self-interest of unrepresentative minorities (Brookfield, 1996, p.376).*

Critical reflection is usually necessary for the process of transformative learning, and is therefore a key for professional development that is seeking to recognise and reframe or change the ways in

which teachers/educators think about theory and practice, and their understanding of diversity. Mezirow (1997, p.60) described phases in transformational learning as "critical reflection on one's assumptions, discourse to validate the critically reflective insight and action".

Ways in which critical reflection can be encouraged are described by Brookfield (1998). He outlined four lenses through which educators can view their practice critically: the lens of their own autobiographies as learners; the lens of learners' (their students') eyes; the lens of colleagues' perceptions; and the lens of theoretical, philosophical, and research literature. The lens of autobiographies is grounded within cultural and historical contexts. In New Zealand, for Pasifika teachers/educators, these include colonisation and Christian values and the challenges of migration and linguistic and cultural maintenance.

The following summarises Brookfield's (1998) views on the processes operating when these lenses are examined:

- Autobiographies as learners of practice are powerful because much of the foundations of teachers/educators' work reflect their own experiences as learners. These experiences are felt at a deep emotional level, and are often instinctively used at times of crisis or uncertainty. "When we are trying to uncover our most deeply embedded allegiances and motivations as teachers, a useful path is to study our autobiographies as learners" (Brookfield, 1998, p.199).
- The lens of students' eyes may be surprising because others read different meanings into words and actions. Brookfield warned that it is important to ensure the anonymity of critical opinions, because students may not feel safe to say what they mean. As well, teachers/educators need to show through their actions with students and through critical public scrutiny of their actions, that they are taking on board what has been fed back to them by students. Brookfield thinks that seeing classrooms and learning from students' points of view is a criterion of good educational practice because without an insight into how students are experiencing learning, methodological choices may be inappropriate or harmful.
- Critical conversation with colleagues can open up new versions of events, reflect back views of the educator's actions, and enable the educator to check, reframe and broaden theories of practice. As well, colleagues can provide emotional support.
- Theoretical literature can also provide multiple perspectives on situations, affirm the educator's own insights, and offer new or different interpretations of experiences. It can lead to a deeper understanding of wider economic, social and political processes that influence learners.

According to Brookfield (1997), critical reflection is context bound. "The same person can be highly critical in one situation, or with regard to one set of ideas, but completely closed to reappraising another situation or idea critically" (Brookfield, 1997, p.18). He also regards critical reflection as a social process, happening best when actions and ideas are seen in new ways. It follows from this, that colleagues and peers become "important critical mirrors". Brookfield believes that assessment of critical thinking should also be grounded in local conditions and be a social process. "Assessment of critical thinking should allow learners to document, demonstrate, and justify their own engagement in critical thinking" (Brookfield, 1997, p.20).

A valuable process in thinking critically is to be confronted with data that is discrepant with beliefs of a person or group. Timperley and Robinson (2001) used schema theory to explain the durability of beliefs, and the social processes needed to change them.

> *According to schema theory, schema are organised knowledge structures representing concepts such as situations, objects, events and actions and the relationships between them. … The central functions of schema are to assist with the comprehension of new data and to predict future events. They serve as recognition devices that allow new data to be processed according to the goodness of fit with current schema. Existing schema strongly influence how the new data might be perceived, so that to a great extent, we perceive what we expect to perceive (Timperley & Robinson, 2001, p.282).*

While the processing of information may be made faster through application of existing schemas, this may also lead to inaccurate interpretation of new data, as occurs for example, when evidence on low achievement in students from low income families is explained by teachers saying the children have no skills. According to schema theory, a key process for schema revision is "creating surprises through exposure to discrepant data" (Timperley & Robinson, 2001, p.283). The essential importance of data to assist with interpretation is described in evidence in studies reviewed in this synthesis.

Experiential learning is based on a belief that adult teaching should be grounded in adults' experiences, which represent a valuable resource. Through experiential learning, adults can connect learning from current experiences with learning from past experiences and possible future situations. Many experiential methods of learning are emphasised by adult educators, e.g., games, role plays, simulations, mentoring in real life situations. However Brookfield (1996) warned that experience may stand in the way of critical insight if experiences or life stories are uncritically affirmed or idealised. Experiences are culturally framed and shaped, constructed through the lens of one's own cultural and ideological perspective.

Learning how to learn does not have an accepted definition, but an often proposed overarching purpose is "becoming skilled at learning in a range of different situations and through a range of different styles" (Brookfield, 1996, p.377). Another term for learning how to learn is "metacognition". Brookfield (1996) cites the work of Kitchener and King (1990) as contributing to research on this topic. In their work, learning how to learn "means that adults possess a self-conscious awareness of how it is they come to know what they know; an awareness of the reasoning assumptions, evidence and justifications that underlie our beliefs that something is true" (Brookfield, 1996, p.377).

These four components of adult learning theory are congruent with a constructivist view of learning defined by Merriam and Caffarella (1999, p.261) as follows:

> *Basically a constructivist stance maintains that learning is a process of constructing meaning; it is how people make sense of their experience. Beyond that basic assumption, constructivists differ as to the nature of reality, the role of experience, what knowledge is of interest, and whether the process of meaning making is primarily individual or social (Steffe & Gale, 1995).*

Research evidence on effective pedagogy

Responsive and reciprocal relationships

Te Whäriki emphasises the importance of responsive and reciprocal relationships in early childhood settings. In köhanga reo, the concept of whänaungatanga is a critical aspect of the kaupapa. Whänaungatanga "expresses or reinforces identity as part of a family group – includes blood ties but also belonging to, and responsibilities associated with participating in a community" (Hohepa, Smith, Smith, & McNaughton, 1992, p.336).

Studies identifying effective pedagogical practice in early childhood education in diverse settings also identify interactions as a key component generally, and provide a useful framework for understanding evidence related to professional development approaches.

The Competent Children longitudinal study which is following a sample of around 500 Wellington region children from their early childhood education centre (all centre types included except köhanga reo) through their schooling, describes the role of early childhood education, home resources, and children's experiences in their development. The study found exposure to the printed word through a print-saturated environment and high-quality interactions with teachers/educators in the early childhood setting, and between children, were key factors making a marked contribution to children's competencies at age 10. The study found the aspects of early childhood education quality that accounted for differences in children's performance at age 10 were:

- early childhood education staff ask children open ended questions;
- the early childhood education centre is print-saturated;
- children can select their own activities from a variety of learning centres;
- early childhood education staff guide children through activities;
- early childhood education staff join children in their play;
- children are allowed to complete their work; and
- children co-operate and support one another.

In summary, Wylie, Thompson and Lythe (Wylie, Thompson, & Lythe, 2001, p.254) stated

> *The long lasting aspects of early childhood education quality are related to how teachers interact with children, and whether they interlace warmth with cognitive content, building on children's interests.*

Similar emphases on building on interests, experiences and knowledge, interactions with others, and active learning processes are found in Mäori pedagogy. Royal Tangaere (1997b) provides a metaphor of the poutama, a woven staircase, to depict learning for Mäori. She stated that there are many messages within the metaphor. The quest for knowledge by Täne-nui-a Rängi, who ascended to the twelfth realm to gain the three baskets of knowledge, is symbolised in the lattice

weaving design. The woven paths depict the inter-relatedness of physical, social, spiritual, and cultural dimensions of learning and the importance of balanced development for each dimension. Learning is a process that takes time and activity, and in which members of the whänau assist each other.

Köhanga reo encourage the tuakana/teina concept of learning and development where an older sibling takes on responsibility for being the teacher or tuakana to his or her younger sibling or teina. The special relationship between the elders and their mokopuna, and the instruction of the whare wananga are also traditional Mäori methods of teaching and learning.

> *It was also normal practice for children to accompany adults or elders and learn through practical experience, as it was for adults to participate and learn through discussions held on the marae or through serving an apprenticeship with an expert (Makereti, 1938; Royal Tangaere, 1997b).*

Royal Tangaere (1997b) pointed to parallels between these Mäori methods of teaching and learning and the concept of scaffolding, originally proposed by Vygotsky (1978), where adults and peers work with children in their "zone of proximal development" to support children to move forward and build new skills and understandings. The zone constitutes what children cannot do alone, but can achieve with assistance.

Siraj-Blatchford, Sylva, Muttock, Gilden, and Bell (2002) provided evidence that those settings which see cognitive and social development as complementary achieve the best profile in terms of child outcomes. Their Effective Pedagogy in the Early Years UK study covered all types of early childhood provision (playgroup, local authority day nursery, private day nursery, nursery school run by LEA, nursery school in primary school, early excellence centres/combined centres, reception classes). It substantiated a model of learning as a process of cognitive construction that is achieved when the child and educator are motivated and involved. "A necessary condition is that both parties are *involved*, and, for the resultant learning to be worthwhile, that the content should be in some way *instructive*" (p.10). They found that the most effective settings encouraged "sustained shared thinking", which they defined in terms of:

a) the teacher having an awareness of, and responding to the child's understanding or capability vis-à-vis the particular subject/activity in question;
b) the child's awareness of what is to be learnt (i.e. what is in the teacher's mind);
c) the active co-construction of an idea or skill (Siraj-Blatchford et al., 2002, p.49).

Other important factors were:

- teachers/educators' knowledge and understanding of the curriculum area (the "curriculum area" in early childhood education in England refers to subject areas like school subjects);
- staff extending child-initiated interactions;
- adult modelling;
- open-ended questioning; and
- children encouraged to initiate activities.

The Effective Pedagogy in the Early Years study suggested a link between curriculum differentiation, defined as "the provision of differentiated curriculum experiences as a response to the identification of the special needs of individual or small groups of children" (Siraj-Blatchford et al., 2002, p.5), formative assessment, curriculum matching in terms of cognitive challenge, and "sustained shared thinking". Child related information about curriculum and learning aims shared between parents and staff, and parent involvement in decisions about their child's learning programmes was also associated with good developmental outcomes.

Better social or behavioural developmental outcomes were associated with staff supporting children in being assertive, and rationalising common conflicts (e.g., through group discussion), and talking through their conflicts.

The findings from the Competent Children study and the Effective Pedagogy in the Early Years study apply across a range of early childhood types, and for children from different ethnic and socio-economic backgrounds. The Competent Children study included a higher proportion of Päkehä/European children than is representative of the general public. However, children came from a range of ethnic groups. In the sub-sample which had full early childhood education data, including quality of the centre at the age of near 5, there were 233 Päkehä/European children, 31 Mäori, 21 Pasifika, 12 Asian, and 10 families from continental Europe. Separate data was not generally reported for Asian and continental European children because of low numbers. Service types were kindergarten, playcentre, childcare, family day care, and a'oga amata. The Effective Pedagogy in the Early Years study covered all types of early childhood education service and children from different ethnic and socio-economic backgrounds.

Esler's (2001) examination (reported on pp. 59–60) of evidence based studies of practices enhancing children's social skills in early childhood settings, identified socio-dramatic play and use of peers as important characteristics.

The Competent Children study, Royal Tangaere's analysis, and the Effective Pedagogy in the Early Years study indicate the importance of supportive interactions with others (adults and children) who encourage children's skill development and enjoyment, who start from the child's interests, and engage and extend children's thinking. Wylie et al. (2001, p.xix) point out that initial teacher education and professional development need to equip teachers/educators to understand and provide these aspects of quality. In order to start from children's interests and experiences, teachers/educators need to understand those interests and experiences. This affirms the importance of sharing knowledge and co-ordinating action to build understanding and consistency between early childhood centre and home, and early childhood centre and other settings which the child experiences. Evidence about how professional development can encourage the kinds of interactions that are associated with learning, and linkages between settings in children's lives, is examined in the next section.

Professional development and adult/child interactions

There is evidence from New Zealand, Sweden, and the UK of the impact of professional development on teachers/educators' interactions with children. The professional development described in this section focused on interactions that are associated with children's learning – scaffolding, extending children's thinking, focusing on the child's questions to encourage learning

strategies and motivation, and interactions that are sensitive, stimulating, and encourage autonomy to deepen child involvement. In some more general studies, there was a focus on adults' self review of practice where teachers/educators chose their own goals. Some of these goals related to adult/child interaction.

Children's learning dispositions

In New Zealand, Margaret Carr as the director of the Project for Assessing Children's Experiences, has applied knowledge about learning into developing processes for assessment. One of the challenges identified by Carr (2001) has been to describe early childhood outcomes in ways that make valuable statements about learning and progress. She described learning outcomes along a continuum as:

- skills and knowledge;
- skills and knowledge + intent = learning strategies;
- learning strategies + social partners and practices + tools = situated learning strategies; and
- situated learning strategies + motivation = learning dispositions (Carr, 2001, p.5).

Learning dispositions are described in the Learning Stories Framework (Carr, 1998a) which elaborates five broad dimensions of learning dispositions that have come out of Te Whäriki's five strands. These intersect and overlap.

> *A Learning Story is a documented account of a child's learning event, structured around five key behaviours: taking an interest; being involved; persisting with difficulty; expressing a point of view or feeling; and taking responsibility (or taking another point of view) (Carr et al., 2000, p. 7).*

Evidence of changed staff behaviours with, and attitudes towards, children and parents was found in the description of case studies in Carr, May, Podmore, et al.'s (2000) action research trial of the learning and teaching stories framework for evaluation and assessment.

This trial took place over a period of a year in two playcentres, two kindergartens, and two childcare centres in Wellington, Auckland and Canterbury. One centre was mainly low income with diverse ethnicity including Samoan, Tongan, Mäori, Indian, Cook Island Mäori and Niuean. The other five centres were mainly Päkehä and mainly middle/upper income.

The centres were selected using the following criteria. They had received little or no professional development with implementing Te Whäriki. They had fewer recently qualified staff and/or less experience in implementing, assessing, and evaluating in regard to Te Whäriki than had been the case in a previous evaluation (Podmore, May, & Mara, 1998). They were not under too much stress and were eager to be involved in the research.

Each centre had an action research facilitator, supported by a researcher, co-ordinating the action research. The process used spirals of observing, reflecting, planning, and acting. Participants selected a "child's question" and selected, adapted, or devised a research tool for gathering data. Questions were related to the strands of Te Whäriki and asked from a child's perspective, e.g., the

"child's questions" related to the belonging strand of Te Whäriki are "Do you know me?" and "Do you appreciate and understand my interests and those of my family?"

A characteristic of the approach was its emphasis on active learning. Carr et al. (2000) also indicated links to six other features of action research that are noted by Atweh, Kemmis, and Weeks (1998). These are that participatory action research is:

- a social process;
- participatory;
- practical and collaborative;
- emancipatory;
- critical; and
- it aims to help people to investigate and change reality.

A number of features of the action research process as a process for self evaluation became apparent over the course of the trial. Carr et al. (2000) described these:

- Increasing collaboration and reflective discussion emerged over time, even though the tools were originally devised by the researchers and project directors. The process was not directed by the researchers and increasingly staff or parents took over.
- The framework catered well for the diversity of participants, because of a balance between giving directions and flexibility. However, the "children's questions" deal with complex and abstract concepts, and assume understanding of how children learn and assessment purposes and practices. This understanding was not evident for all participants, and the researchers felt they would have liked to spend more time introducing the Learning Stories Framework itself.
- The effectiveness of action research tools was influenced by structural factors, relationships, demands of busy centres, and assumptions about professional development.
- Partnerships between insider and outsider were regarded as important by participants, with the "outsider" able to guide, keep participants on task, and observe. Researchers emphasised the importance of having at least one participant who could model reflection and critique of her own and the centre's practices.
- There were shifts in the participants' interest from activities to "children's questions" and from a concern for external accountability to pedagogy.

> *In particular, many of them (teachers/educators) became interested in criteria for responsive and reciprocal relationships between learners and people, places and things (a pedagogical principle in Te Whäriki) by investigating and evaluating their own conversational styles and interactions, and episodes of peer inclusion and exclusion (Carr et al., 2000, p.59).*

- There were shifts towards greater reflection and willingness of adults to analyse their own interactions.

In each of the case studies, different issues were identified which reflected their particular contexts. Some general themes were apparent in considering these issues:

- Difficulties in incorporating the involvement of large numbers of parents were evident. It took until the end of the project (12 months) for some to participate and start to gain confidence. Some parents, for example, were learning about their centre and had concerns other than implementation of Te Whäriki.
- In centres where teachers/educators were less confident, more guidance was needed from the action research facilitator, and teachers/educators covered less in the timeframe.
- Change took time, and at the end of the year some participants thought they had "only just started".
- It was thought that centres with teachers/educators who were less confident might not use the Learning Stories Framework without the help and discipline of an outsider.

The research provided useful evidence from the researchers and practitioners about the value of different tools to challenge assumptions, facilitate analysis and planning, link to the child's question, facilitate evaluation as to whether an action had made a difference and energise staff to reflect on their practice. In addition, the precision and ease of use of tools was gauged. Using these criteria, Carr et al. (2000, pp. 55–56) concluded that the most valuable tools were those that:

- generated the most reflective discussion by challenging assumptions and providing data that made sense. For example, playcentre members video-taped potential episodes of exclusion and inclusion and then discussed and developed criteria for these. Use of a simple questionnaire asking families about their hobbies and interests, their expectations of the kindergarten, and ways they might contribute surprised teachers working in a kindergarten in a low income community with largely Mäori and Pasifka children. "Staff found that through the responses to the questionnaire some of their preconceptions about lack of richness in these families' lives were challenged; for example, there was more reading going on in homes than they thought" (Carr et al., 2000, p.32);
- included early discussions about criteria;
- did not put staff down. For example, observations by staff of each other included examples of good practice as well as examples of practice where they "missed the boat";
- included peer observations of each other in an atmosphere of trust. Episodes of individual staff interactions were valuable. For example, one childcare centre devised a tool called "secret spies" in which staff were allocated another staff member to observe secretly over two weeks. The observations noted ways in which each person listened to children, engaged them in conversation and responded to their efforts. A list of good practices developed from an earlier retreat provided some criteria. Carr et al. (2000, p.35) noted that for most staff this was the most successful and powerful tool in their professional development because "the greater the risks staff are prepared to take, the more powerful and useful the tool";
- could be translated into a chart that offered an accessible and easily read evaluation. Data could reflect change, and this was also encouraging and motivating for staff or parents; and
- reflected the interests of staff and/or parents in a setting.

Carr et al. (2000, p.56) noted that

> *. . . there are further types of standard or validity that need to be addressed when the overall programme is the focus: convergence (where several sources of data – tools – are employed for each child's question of interest); collaboration (whether all participants are involved); equity (whether multiple ways of knowing and thinking and communicating are incorporated); and agreement (whether different perspectives are included).*

Most highly rated action research tools had benefit in helping practitioners to respond to diversity, because they could be used to evaluate teaching practice in respect to all children across particular strands of Te Whäriki. For example, they demonstrated ways to collect data on every parents' views, not just those who came to a meeting or who initially responded to a request, ways to examine inclusion and exclusion within a setting, ways to analyse what behaviours would indicate that a child was tackling or persisting with difficulty and ways to examine engagement of teachers with under twos.

Carr noted (1998a, p.37) that professional development will be necessary to support the development of focused and participatory observations required by the Learning Stories Framework and that there needs to be management policies and funding to support reflection and action research over extended periods of time.

One New Zealand and two Swedish studies provided evidence of professional development or training aimed at influencing teachers' interactions with children. The focus of these programmes was on interactions to extend children's thinking, one through scaffolding children's learning (Jordan, 1999), a second through the adult role of mediating between the child's experience and the environment (Palmerus & Pramling, 1991; Pramling, 1996), and the third through a programme developing ways in which early childhood students in pre-service training deal with children's life questions (Pramling Samuelsson, Johansson, Davidsson, & Fors, 2000).

Scaffolding children's cognitive learning

Jordan (1999) described the value of listening to children's thinking and the support of technology in this process. She pointed out that scaffolding of children's cognitive learning has a sound foundation in current research and literature in early childhood education (e.g. Bruner, 1975; Vygotsky, 1986/1934), but the "how" to accomplish scaffolding and co-constructive interactions in practice, in the climate in which most staff members are working, is less well documented. She reported on her case studies in one childcare centre and one kindergarten in which teachers engaged in programmes of professional development, with a focus on planning processes which extend children's thinking.

Phase one of the professional development included about six 2 hour staff meetings over a period of about six months in which interviews took place and staff familiarised with a radio microphone and video camera. The researcher videotaped selected children (two or three children in each setting) before, during, and after a planning focus on the children. The children were all aged 3 to 5 because the focus of the study was on verbal interactions. Staff members were given transcriptions of video and audio recordings for their own analyses and use in planning. Throughout the project, computers were used to make photo prints from the video recording of

children's activities, to research topics of interest to the children, and to use as an administrative tool in planning. Radio microphones were used to record and analyse adult-child dialogues.

Written documentation was collected. At each phase staff asked themselves critical questions. First phase questions were:

- How are we scaffolding children's learning?
- What does this mean for the children and us?
- What are our beliefs about scaffolding both as a team and as individuals?
- Where did our beliefs and practices originate?

Phase two (which overlapped with phase one) involved learning about scaffolding of children's ideas, co-construction of learning and the role of documentation of dialogue in the development of projects. As well, decisions on actions to improve scaffolding of learning were made. Teachers undertook analysis of verbal scaffolding, transcripts of audio tapes of staff interacting with children, and considered definitions and models of scaffolding, levels of reflection, and cognitive functioning.

Key phase two questions were:

- What are our alternatives for improving practice in scaffolding?
- How can we support each other in this process of scaffolding?
- How can we support each other in this process of improvement?
- How can we find out what the children are really thinking and extend their learning?

In phase three, Jordan (1999) stated that improvement was made in some areas including planning (especially documentation of dialogues), the development of projects with children based on analysis of dialogues, greater involvement of parents in the programme, and children's learning at home, staff researching topics of children's interests to extend their knowledge base, use of photographs printed from the video to initiate dialogue with children, and consulting children about plans for extension activities. However, she did not describe the exact nature or degree of change.

Staff and facilitator analysed pre- and post-questionnaires and earlier and later transcripts, asking:

- What has changed for the children, the staff, and the parents?
- Where to next?

In phase four, 12 months later, there was a further visit of the researcher to monitor sustainability. Jordan provided some examples of teachers describing their own learning, e.g., teachers realising they needed to provide more spaces for children to talk, to listen to what children were saying, to encourage children to listen to each other, and often to be silent. Teachers also realised they needed further information about topics the children were interested in.

The role of the facilitator and staff members changed over the time. The facilitator changed from directing the process to minimal support, and the staff from responding to independently implementing changed practice.

The study provided evidence of how the use of technology in the form of radio microphone, video recorder, and computer could be an effective tool in supporting the scaffolding of children's learning. Teachers were able to analyse recordings later and see things they may have missed. Computers could be used to print from video recordings, to find out knowledge related to children's interests, and as support in recording.

Mediating learning experiences

Pramling (1996) and Palmerus and Pramling (1991) described an intervention study with three Swedish daycare centres in communities with a relatively high number of social welfare benefit recipients. In one centre there were 14 children aged between 1 and 4, in the second 14 children between 1 and 3, and in the third 16 children between 1 and 3. Staff/child ratios were higher than is common in New Zealand settings (4:14; 4:14; 5:16 respectively in the Swedish settings compared with a regulated ratio of 3:11–15 for under twos and 2:7–20 for over twos in all-day New Zealand settings). The authors did not describe the ethnicity of the children.

The intervention was aimed at improving the quality of mediation by increasing the psychological and educational knowledge of staff about the quality of mediation and developing content and methods appropriate for mediational interactions with toddlers. It also aimed at increasing staff awareness of young children's development and needs, as well as their awareness of their own behaviour. Palmerus and Pramling cited Klein's (1989) view that through mediated learning experiences, adults could influence children to become aware of the world around them, learn about things and people, create flexibility in thinking, and learn "a positive way to learn".

Mediation refers to aspects of learning where an adult mediates between the child's experiences and the surrounding environment. The mediational categories used in the programme were based on Klein's (1989) MISC programme (More Intelligent and Sensitive Child), which seemed to the researchers to be appropriate for developing staff competence in mediation and communication with young children. It was important for them to present the programme in a way that would be acceptable to early childhood staff in Sweden. The notion of "intelligence" is rarely used in Swedish settings, where there is a broader philosophy that education and care are closely related, the focus is holistic, and play and creativity are important aspects of the curriculum, with work being more child centred. Therefore, the researchers developed the first three categories in the MISC programme to six, to distinguish teacher-centred and child-centred interventions, as follows:

- intentionality and reciprocity – the adult initiates or leads the interaction;
- intentionality and reciprocity – the toddler leads or initiates the interaction;
- giving meaning by naming;
- giving meaning by questioning;
- transcendence (expanding or going beyond the here and now) – provided by the adult;
- transcendence (expanding or going beyond the here and now) – provided by the child;

- feeling of competence – praising the toddler;
- feeling of competence – explaining, motivating;
- regulation of behaviour – commanding; and
- regulation of behaviour – explaining why.

Aims were to improve the quality of mediation in the childcare of young children, the psychological and educational knowledge of childcare staff about the quality of mediation, and to develop the content and methods appropriate for mediational activities.

> *Our basic assumption was that the more an adult is able to understand a child's intentions and feelings, the better she/he will be able to meet the child's needs through an appropriate interaction. . . . We intended to increase the staff's awareness of young children's development and needs, as well as their awareness of their own behaviour (Pramling, 1996, p. 181).*

The intervention was:

- a one week condensed course covering theories and empirical findings about children's development, and information about the Swedish "pre-school program";
- introduction of Klein's (1996) intervention programme (MISC).

The intervention took place over a 19 month period. Every fourth week the interaction between children and staff (group and individual) was video recorded and analysed in group meetings for all educational staff in their own setting, in relation to criteria of MISC and the content and organisation of the recorded interactions. Different ways of mediating in the situations were discussed.

In interviews after the intervention, staff expressed views that the intervention programme had brought them to a more consistent view about their programme for younger children and gave them a broader scope for looking at infants' and toddlers' needs. It therefore became easier for staff to co-operate. They thought that routine activities were being used in a more stimulating way, which meant that education and care became better integrated. Staff felt their role became more differentiated from the role of parents, they felt freer to enhance children's cognitive or social development, and they followed more specific objectives of interaction with children. They became more aware of reasons for their own behaviour and recognised their role as teachers/educators. They saw the relationship between care and education as a function of the quality of interactions throughout the day.

> *Everything could be done in an educational way. This conclusion meant that the staff now, to a large extent, let the children do things in their own way, that is arrange the table, dress, tidy up the toys before lunch, and follow their activities with enriching mediation (Pramling, 1996, p.184).*

Some structural reorganisation was done, to enable staff opportunities to interact continuously with each child throughout the day. Most children were reorganised into smaller groups with their

own staff instead of larger groups with the entire staff. All staff members thought there were benefits in seeing themselves on video. The opportunity to revisit educational experiences provided a wider view of these experiences.

An independent observer coded video recordings of staff interacting with children according to the MISC criteria, by keeping note of each minute in which a certain category appeared. The percentage of coded minutes was calculated.

> *The general overall finding was that the children in the three groups were involved to a far greater extent in interaction with adults at the end of the project than at the beginning. The general trend for staff was to become more able to take the child's perspective and get the child to think, reflect and verbalise (Pramling, 1996, p.185).*

The following changes occurred:

- *Child initiated communication.* In one group (a newly organised group) the percentage of child initiated communications increased from 30 percent to about 50 percent, while in the other two groups, the percentage slightly decreased. The mean increase was 4 percent. The group that had the highest percentage of child initiated communications had the lowest percentage of staff initiated communications (but this also increased for this group by about 10 percent). The group with the highest percentage of staff initiated interactions (about 80 percent reducing to 75 percent) were nursery assistants who tried to "teach" the children rather than follow their initiations. The mean increase was 3 percent.
- *Mediating meaning.* There were only minor changes to this category, but all adults talked a lot to the children, naming and labelling things. The largest change was for the newly organised group which had an initially lower level of mediation and increased this by 10 percent.
- *Transcendence.* This category is regarded by Pramling as the most important in the MISC programme because it provides the foundation for later metacognitive awareness. In each group, transcendence provided by the adult increased – from 16 percent to 34 percent (by18 percent), from 16 percent to 44 percent (by 28 percent) and from 42 percent to 48 percent (by 6 percent). The mean increase was 18 percent. Transcendence provided by the child increased for two groups and decreased slightly for the other. The mean increase was 6 percent.
- *Mediating feelings of competence.* There was an increase for all groups in praise with explanations (mean increase of 8 percent), but not in mechanical praise (mean decrease 2 percent). Nonverbal feedback was not picked up in this category.
- *Regulation of behaviour.* Regulation of behaviour with explanation increased for all three groups, with a mean increase of 9 percent. Commanding disappeared entirely for one group and marginally increased from low levels for the other two. The mean increase for commanding was 1 percent.

Pramling (1996) compared these results with a study by Larsson (1993), cited in Pramling, I. (1996, p.192) who video recorded three groups of children and their childcare staff, who did not have the intervention. There were no significant differences between the groups in the two studies

with regard to “intentionality and reciprocity”. There were small differences between the studies’ findings in “mediating meaning” in favour of the intervention study groups. The most significant differences between the groups in the two studies, in favour of the intervention groups, was in “transcendence” (both adult initiation and expansion and child initiation and response). There was a small difference in favour of the intervention group in adults explaining their praise.

Pramling (1996) noted that while the MISC programme is supposedly culturally independent, the focus on specific criteria is an expression of cultural values. In the Swedish study, the child centred approach and transcendence were the categories that were most valued by project leaders and were the categories in which staff demonstrated most progress. She noted a tendency for less educated nursery assistants to use more mechanical aspects of the mediational categories, to label and talk for the sake of doing so and to be less able to try to find out what was occupying the child’s mind. Palmerus and Pramling (1991) said that those staff who made the most progress often had the greatest interest in educational methods, implying a link between the educational level of the staff member and efficient use of the mediated learning experiences approach.

Palmerus and Pramling (1991) pointed out “that work with toddlers requires great ability and knowledge. Staff must be able to understand children who are not able to communicate verbally.” They stated that the education course at the beginning of the intervention assisted staff to change their opinion about the need for education of toddlers, but the staff needed to look at and analyse the video-records in order to change their style.

Finding out the child’s life experiences

Pramling Samuelsson, Johansson, Davidsson, and Fors (2000) explored qualitative differences in pre-service students’ experiences of children’s life questions, their methods in dealing with differences, and potential for change. Although these students were in initial teacher education courses the findings have relevance to this review of professional development because they point to the importance of metacognitive aspects of adult learning and adults’ awareness of their way of experiencing and approaching children. Two classes of pre-service students (n=46) participated as the project group. A comparison group of 19 pre-service students in traditional courses at other universities was followed. In all settings the content “children’s life questions” was part of the education, but the manner in which it was taught differed. In the project group the metacognitive perspective was emphasised with opportunities created for reflection.

Interviews, keeping a diary, and working with ethical dilemmas were methods used to encourage project group participants’ reflection. Researchers asked participants provocative questions, discussing the answers and asking participants about their motives.

After the intervention Pramling-Samuelsson et al. (2000) found that pre-service students in the intervention group emphasised the importance of finding out the child’s point of view and tackling the child’s questions together. The pre-service students found their roles and questions were a tool for helping children develop their thinking and understand the world around them. These changes in the pre-service students were attributed to a new awareness of attitudes and exposure to a diversity of different ways of thinking. This seemed to challenge taken for granted ways of thinking.

Changing teachers' schema

Timperley and Robinson (2001) used schema theory to examine the micro-processes involved in changing teachers' beliefs and practices about new entrants in four schools in Otara and Mangere. In these schools, teachers initially underestimated children's or parents' knowledge and skills, and attributed low student achievement to external factors, such as children's and parents' deficits.

Schema theory refers to "organised knowledge structures representing concepts such as situations, objects, events and actions, and the relationships between them. . . . In the schools in this study, schema about the causes of low achievement were articulated as 'sayings' which appeared to be treated as accepted wisdom" (Timperley & Robinson, 2001, p.282). According to Timperley and Robinson, schema influence how new data is perceived – they help with comprehension of data and prediction of future events. However, while enabling fast processing of information, this process can also lead to inaccurate interpretation of data.

Timperley and Robinson (2001) provided evidence of three critical conditions for schema revision when schema are counterproductive to teachers' challenging practice that contributes to low achievement:

- the salience of discrepant data;
- the presence of an external agent to assist with data collection and interpretation; and
- the availability of information on alternative practices.

They reported on a study of four of the schools that took part in initiatives in Mangere and Otara to strengthen the education offered. The average income status of parents in the 4 schools was categorised as being in the lowest 10 percent in New Zealand. Children were mainly Mäori or from one of the Pasifika nations. While this provides school based rather than early childhood evidence, it is reported here because of the light it casts on conditions for challenging assumptions and changing pedagogical practice.

In each example, the schema focused on deficits of parents and children, and discrepant data was collected and analysed.

In the first school, teachers gave many examples of inadequate and inappropriate early skills and made assumptions that the children arrived at school with "no skills". Following the suggestion of the outside researchers that skill levels should be tested rather than assumed, teachers decided to test what skills students had on entry. This test data showed that children's skill levels were much higher than most teachers assumed them to be. However, although the data was discrepant with teachers' assumptions, the alternatives for interpretation initially raised by the teachers continued to be consistent with their "deficit" views. It was not until outside researchers questioned these interpretations and raised alternative possibilities that teachers began to shift their views.

In the second school, teachers regarded parental attitudes, skill levels, and lack of involvement in their children's education as a major contributor to children's low achievement. Books were not sent home with children because the school predicted that the loss rate for sending books home would be too high and costly. In this school, these deficit assumptions were tested when they held parent education meetings, which resulted in very high parental attendance. This prompted the

staff to revise its policy on sending books home, and approach the task of having the books read and returned differently. Encouraged by the intervention team, teachers held parent meetings to explain to parents the purpose of the activities and expectations about book return. At the end of the year there was a low rate of loss of books (4.5 percent compared with the 40 percent anticipated) and 80 percent of the reading records were signed by a family member every night, showing that books were read to someone at home. In this school, staff continued to test other assumptions as part of any diagnosis of achievement problems. As well as the availability of discrepant data, one third of staff were involved in an intensive professional development contract (which also included dissemination structures and strategies to inform the rest of the staff). This offered alternative ways to teach.

In the third school, teachers took part in a professional development programme which demonstrated alternative teaching practice in early literacy. On its own this did not challenge teachers' assumptions. Teachers were guided by the professional development contractor to gather data on letter identification. The data was discrepant with what teachers had estimated the children could do. At the end of the course, teachers' expectations for children's progress had increased considerably, and there was a marked shift in reasons given by teachers for children falling below national levels in literacy.

> *Prior to the course 87% of the reasons focused on children and family deficits. After the course, this percentage had decreased to 13%. By this time, 87% were school based. . . (Timperley & Robinson, 2001, p.294).*

In the fourth school that took part in the professional development programme, teachers adapted rather than adopted the alternative teaching practice. Timperley and Robinson (2001) argue that this school failed to test the alternative offered because it did not fit in with their current schema of the slow and gradual acquisition of literacy skills. There was no change in teachers' schema, with the percentage of reasons that described children and family deficits rising from 75 percent prior to the professional development to 83 percent after completion.

Adult engagement and child involvement

The Effective Early Learning Project (EEL) aimed to develop a strategy to support teachers/educators in implementing a programme of evaluation and improvement for children aged 0–8 years and to evaluate and compare the quality of early childhood education in the diverse settings in the UK. The Quality Evaluation and Improvement procedures have now been used in more than 2500 different types of early childhood settings in the UK, the Netherlands, and Portugal (e.g., school reception classes, voluntary playgroups, pre-school playgroups, social services day nurseries, and private day nurseries in the UK) (Pascal, 1999).

The project has involved a collaborative partnership between researchers (an EEL adviser) and teachers/educators at all stages. Teachers/educators also become part of a local EEL network, who meet together every six weeks for support and discussion. The evaluation and improvement processes follow four stages:

- evaluation – researchers and participants document and evaluate the quality of the early childhood setting;

- action planning – participants meet together to identify priorities for action and develop an action plan;
- improvement – implementing the action plan; and
- reflection – participants are encouraged to reflect on and review the impact of the action plan.

Two key observational techniques are used in the assessment of learning and teaching processes. The Child Involvement Scale measures children's level of involvement in activities and is based on Laevers' (1996) concept that when children are showing deep learning, they display certain characteristics of involvement and these are a key indicator of quality. Involvement "signals" include concentration, energy, creativity, facial expression and posture, persistence, precision, reaction time, language, and satisfaction.

> *Involvement can be seen to be linked to notions of "match" between an ability and the challenge of an activity. Involvement also reflects the purposefulness, relevance and interest of the activity for the child (Pascal, 1999, p.47).*

The Adult Engagement Scale measures the qualities of an adult's interactions with the child. The three core elements of interaction are *sensitivity* to the feelings and emotional well being of the child, *stimulation*, and *autonomy* – the degree of freedom the adult gives the child to experiment, make judgments, choose activities, express ideas, and handle conflict and behavioural issues.

The whole EEL cycle is estimated to take a year to implement. However, Pascal (1999, p.49) noted that the cycle takes longer if fundamental improvements are sought or the teachers/educators are not used to self evaluation and development.

The process can be regarded as a type of professional development, with a researcher working in a collaborative relationship with teachers/educators.

Mould (1998) used the EEL concepts of "involvement" and "engagement" in a study to analyse, evaluate, and enhance early learning of 4 year-olds in four reception class settings in a large metropolitan city in the UK. The researcher observed levels of adult engagement and child involvement, and collected evidence from teacher interviews, parent interviews, research journals, and other documentation. The researcher collected initial data and observations, discussed and evaluated the analysis with the teacher in formal and informal meetings, fed the evaluation into the planning and practice, repeated observations and child interviews, made final visits, and discussed the analysis. During the work, the researcher supplied research articles and literature requested by the teacher. Relevant conferences were attended. This work took 11 months.

Preliminary results showed that levels of adult *engagement* rose between summer and autumn terms on a 5 point rating scale (level 1 is the lowest level for each category, and level 5 the highest). Average sensitivity levels rose from 4.6 to 4.73, stimulation from 3.76 to 4.01, and a striking rise in autonomy from 2.99 to 3.85. The rise in scores for stimulation and autonomy was statistically significant. Note that the scores for sensitivity started from a high base, so little change could be expected.

Each of the school's average level of child *involvement* rose over the time. In schools with the highest level of involvement, parents took an active role by returning forms and research documentation. In addition, teachers were all keen to extend their knowledge of theory underpinning practice once they had extended their knowledge. There was a link between teachers' increases in levels of engagement and the increases of involvement levels of the children they taught. The teacher with the highest increase in level of engagement taught the child who showed the highest increases in levels of involvement. The teacher who showed the lowest increase in levels of involvement taught the children who showed the lowest increase in level of involvement.

Mould used these results to advocate research that involves classroom teachers or focuses on teaching, works out the meaning for day-to-day practice, and reports findings in useful ways.

Ramsden (1997) investigated the EEL Quality Evaluation and Development process in one rural playgroup in the UK. This was a community based sessional centre serving 24 children and operating with a supervisor, an assistant, and three paid helpers. Children were 3 and 4 years old, none had special educational needs, and all had English as their first language. The study took place over eight months, following similar methods to Mould (1998) of data collection, action, development, and reflection.

Twelve children (boys and girls) were observed over two mornings and rated on the involvement scale. All staff were observed on four days and rated on the engagement scale. Ratings happened in September 1994 and March 1995. There was an increase of level 5 involvement from 15 percent at the start to 42 percent at the end of the programme, with fewer children experiencing level 1 involvement. Level 5 adult engagement increased from 0 percent at the start to 14 percent at the end, with a decrease in level 1, 2, and 3 engagement.

Self review using *The Quality Journey* in New Zealand and action research in the UK

In 1999, the Ministry of Education published a resource kit, *The Quality Journey* (Ministry of Education, 1999), which was designed to give guidance to centres in self review of their programmes. The review model in the kit follows a process of Plan (prepare for the review, choose an approach, and set standards) >Do (gather information) >Study (analyse and evaluate results, recommend future actions, document and share findings) >Act (affirm, change or abandon aspects to improve outcomes, monitor actions). *The Quality Journey* deals not only with teaching and learning interactions, but also the framing conditions to support the operation of the service, i.e. adult communication and collaboration and organisational management. Carr et al. (2000, p.75) draw parallels between the Learning and Teaching Stories Framework and *The Quality Journey*. However, some examples in *The Quality Journey* are somewhat mechanistic, e.g., (Ministry of Education, 1999, p. 22) an example of a "quality indicator" for educator/child interactions with infants is described as "Educators respond promptly to infants when they express a need for attention." The example showed the next step to be agreeing on a definition for "promptly" and that "95 percent of infant calls should have a prompt response". The crucial nature of the adult's response was not discussed in this example.

McLachlan-Smith, Grey, and Haynes (2001) suggested a number of improvements to the publication, *The Quality Journey* resource kit, based on an evaluation following its use by 74

early childhood centres described below. These were inclusion of more case studies and putting more emphasis on goals. The participants also said that they would not have used the document fully if they had not been involved in professional development in conjunction with its use.

Evaluations of two professional development programmes using the kit as a resource have been made, and suggest that the programmes led to some changes to teachers/educators' knowledge and skills (Depree & Hayward, 2001; McLachlan-Smith et al., 2001). Neither evaluation was reported in sufficient detail to be able to fully examine the findings, but are discussed here because of the use of professional development with the resource kit within New Zealand. A full report from McLachlan-Smith et al.'s (2001) evaluation is still to be published.

McLachlan-Smith, Grey, and Haynes's (2001) conference paper provides preliminary findings from their evaluation of a professional development project over a period of a year to help 74 early childhood centres to implement *The Quality Journey* and quality self-review. The professional development comprised four full-day workshops on how to design self-review projects on teaching, learning and development, adult communication and collaboration, and organisation and management. The programme was designed to be participatory, meaningful in an early childhood context, and focused on understanding and practical skills. The professional development introduced ideas and tools that went beyond the examples of *The Quality Journey*, e.g., methods of collecting views and data. A project support person visited each centre twice during the year, to assist with design or implementation of the review projects. The centres were 28 childcare centres, 23 kindergartens, 13 playcentres, five Montessori pre-schools, four community crèches, and one Samoan centre located in three areas of New Zealand. Two people from each centre were invited to participate.

The evaluation included surveys of participants at the start of the process, midpoint and at the end, focus groups at each workshop, feedback on self-review projects to the project support person, interviews with participants, and an evaluation of *The Quality Journey* at the fourth workshop.

Reported results from the surveys were that participants felt better prepared to implement self-review following the programme and felt their knowledge and skills about the specific topics covered were enhanced.

What is not clear from McLachlan-Smith et al's (2001) paper is the extent to which professional development aimed at assisting centres to self-review did in fact impact on pedagogy. Most participants said their interactions with children had improved because their methods of documenting teaching and learning had improved. Participants thought they developed better skills for communicating with staff and parents and *The Quality Journey* helped them set up better systems for monitoring the Desirable Objectives and Practices (DOPs). The DOPs set out guiding principles, and a framework related to learning and development, communication and consultation, and operation and administration that are required to be met by chartered early childhood services. A negative perception of some participants was that use of self-review and *The Quality Journey* could take people away from children and increase administrative work. This would seem to indicate that some teachers/educators learned to review for the sake of reviewing rather than for learning purposes.

A main finding from the focus groups, interviews, and questionnaires was that the use of practical tools and opportunity to try these out made a major contribution to participants' views of the success of the professional development programme. Barriers to implementing self-review were reported to be inadequate staffing levels, having to bring staff who did not attend the workshop on board, resistance in playcentres to self-review from some parents, motivating untrained staff, and cultural barriers. These findings reinforce the need for appropriate levels of staffing to support self-review. They indicate that motivation plays a role in whether participants are open to learning from professional development opportunities. They also lend support for a view that whole centre approaches to professional development may be more effective than individually targeted approaches in bringing about positive change in programmes because they have greater potential to bring all staff on board. The importance of appreciating cultural experiences and viewpoints when these are different from the educator's own experiences and viewpoints is an issue.

The trialling of *The Quality Journey* resource is described by Depree and Hayward (2001). The trialling included an in-service course in ten Christchurch early childhood centres facilitated by the writers to provide information on the resources and how to implement a quality review, two cluster meetings with all participating centres and facilitators in each region, and whole team professional development over 15 hours per centre. The length of time over which the professional development programme took place was not specified. The authors described data from three of the ten case studies. These were two privately owned and one community based centre.

Each identified their own topic of review, namely one of the following:

- Are we as educators developing children's sense of responsibility for the safety and feelings of others?
- How effectively are we providing opportunity for parents/caregivers to take an active role in our centre life?
- How are we incorporating bi-culturalism into our daily practices?

Final evaluations from participants in the three centres highlighted positive changes, including awareness of teaching practices, participants being challenged to lift their standards, teams working together and enhanced problem solving. The authors reported some changes to structures which centres identified through the data gathering exercise, e.g., changing rosters to ensure teachers/educators could be actively involved with the children, introducing rolling morning teas to alleviate queuing, and systems developed to process resources contributed by parents. Changes were reported in centres in interactions with children, e.g., centre hui where children and adults contributed ideas related to content, time and place replaced group times, teachers/educators increased their use of te reo. An example was given of new strategies in one centre of adults guiding children's behaviour rather than reacting to inappropriate behaviour.

Facilitators supported the process of implementing the cycle of the review process set out in *The Quality Journey* by working alongside centre team members to develop data gathering tools, and through the "study" and "act" cycles, but details of this support are not given.

Depree and Hayward's approach differed from that of McLachlan-Smith et al.'s in providing whole team professional development within centres and an emphasis on each centre setting its

own goals rather than covering all the areas in *The Quality Journey*. The issues reported in the McLachlan-Smith et al. approach (resistance from some centre parents and the difficulties of getting untrained staff on board) were not described by Depree and Hayward, possibly because of their more focused and inclusive approach (or because such issues were not investigated).

Self review through action research in UK settings

The Principles into Practice in Early Childhood Education Project (Blenkin & Hutchin, 1998; Blenkin & Kelly, 1997) is a three phase project aiming to evaluate existing provision for early years education (0–8) in England and Wales and to consider ways of improving its effectiveness.

In phase one, a survey of 2,420 early childhood teachers/educators from a cross section of services in the UK asked for information about the early childhood education institution, the number and qualifications of staff, and the quality of early learning including the factors that head teacher respondents felt were influential in the professional development of teachers/educators working with under 8s. Of particular interest for this section were these latter responses. The highest ranked factor, producing "almost consensus" across all settings, was "knowledge of child development" (Blenkin & Kelly, 1997, p.23). Other highly ranked factors were "ability to assess individual children", "organisational skills", and "partnerships with parents", findings which Blenkin and Kelly interpret as indicating an educator view that what constitutes quality in early childhood is a focus on the child. There was a low rating given to the evaluation of provision.

> *This suggests a real area of weakness which the profession may have to accept has been largely responsible for the substitution of subject oriented evaluation in support of central government–led initiatives in policy (Blenkin & Kelly, 1997, pp.53-54).*

The first pilot phase also involved case studies of staff in 11 early childhood settings. The settings were representative of a range of early years provision and staff had different professional backgrounds and responsibilities. In each case study, a member of the research team worked with an individual educator, using an action research method. Analysis of the case studies was based on reports and field notes made by the research partners, and action research evidence collected by the team, mainly of written observations, audio, and video material.

The teachers/educators' evaluation of effectiveness was compared with the research partner's evaluation of evidence of development. The project team defined "success" criteria as:

- reports by the teachers/educators themselves of benefits and improvements in practice;
- research partner's evaluation of developments; and
- a decision by the setting to continue the project beyond the pilot year.

On this basis 7 of the 11 settings were deemed to have made progress. In the successful case studies action research seemed to help teachers/educators recognise what was happening in practice, re-evaluate practice, and look at alternatives.

> *One of the most valuable gains was the confirmation or recognition of the need to use close observation as a diagnostic tool and of the need to be more analytic in assessing the quality of what children do. For observations carried out often revealed different explanations of what was happening in practice and raised new questions about and insights into children's learning. Indeed some of the educators were conscious of advances in their thinking, and others reported the ways in which the action research had challenged previously held assumptions about their practice (Blenkin & Kelly, 1997, p.97).*

Lessons were learned from the successful case studies and from the four case studies that did not meet "success criteria" that indicate features that promoted professional development through action research and features that inhibited development. Factors were distilled that could be related to every setting.

These were:

- The educator's personal motivation and confidence in their practice. Development did not take place where teachers/educators were not motivated. As well, the educator seemed to need to be confident to develop his/her own practice rather than regard the professional development as a passive training opportunity. Some appeared to be inhibited by the presence of academic staff or making their practice public.
- Training of staff. In most, but not all, of the successful case studies there were trained teachers, and in the unsuccessful, untrained staff predominated.
- Teachers/educators in control. Those teachers/educators who took control of the direction of their action research and made their own observations alongside evaluations made the most progress. Some needed help to do this.
- Individual versus group work. Working with groups of teachers/educators with different needs and goals seemed to inhibit progress. However, Blenkin and Kelly (1997, p.100) noted that this issue warrants further investigation, as evidence shows value in comparing notes. This finding suggests that the issue of whole team versus individual approaches is complex, and there may be pros and cons in different situations for taking either.

In the second phase, case studies were undertaken over 18 months in 67 early childhood settings, including the 11 pilot centres, with both trained and untrained early years staff who acted as "action researchers". The action research cycle involved finding a focus, collecting evidence, reflecting and asking questions, taking action, collecting more evidence, evaluating, refining the focus etc. Each participant worked with a member of the research team acting as a "critical friend" or "research partner" over a three month period. Participants were encouraged to keep evidence, records of observations, or journals of thought processes so these could be analysed in discussion. Networks were also established where participants could discuss their work.

Blenkin and Hutchin (1998) noted that observation is not often a feature that is widely discussed in action research, but in the Principles into Practice project a range of observation techniques were commonly used to obtain evidence. There was some evidence from the case studies of ways in which observations were used to develop thinking and practice. For example, one participant's use of observation enabled her to move beyond insights into how individual children were

operating to making broader generalisations that she could relate back to theory and to understanding of the role of the adult in child/adult interactions and activities.

Another participant focused her action research on language skills. She collected data using observations, tape recordings, and photographs. She asked in each situation "What made the child talk? In what situations did he/she talk most?" Evidence enabled her to analyse in what ways she could spend extra time supporting children's language development in group activities. She also evaluated how to stimulate conversations between children.

Not all case studies were regarded by the research team as "successful", with some considerable action research being done and abandoned, and in others change being implemented without research or reflection. The authors wanted the next phase of their project to question what prevented these participants from developing thinking or practice. This could raise some questions about this approach.

Behaviour management for kindergarten children with severe behaviour disorders

A different approach, focusing on one particular group of children described as having severe behaviour problems, was taken by Langley (1997). Langley trained kindergarten teachers from four Christchurch kindergartens in skills to enable them to better manage such children, and studied the impact of the training programme on teacher and child behaviour. Children were selected for the study if their behaviour met the following four criteria: engaging in behaviour which adults found aversive; engaging in these behaviours more frequently than did normally developing age-mates; engaging in these behaviours across a range of settings; and engaging in these behaviours since they started kindergarten.

Teachers used a three stage screening process to select two target children:

- Teachers in each kindergarten nominated their most difficult to manage children.
- All teachers independently completed the Canterbury Social Development Scale for the nominated children. This scale has been used with 95 percent accuracy with primary school aged children and was developed locally.
- Children were observed in the kindergarten on five occasions and the rate of antisocial behaviour was measured.

Social learning theory was used as the conceptual framework for his research. This "argues that the child is part of a complex social system and that problem behaviours are shaped by the interactions between the child and the environment. . . . Intervention involves changing the child's environment and the responses of others to the child's antisocial behaviour in specific ways" (Langley, 1997, p.34).

Langley provided evidence that parents of children with problem behaviours reinforce these behaviours by, for example, submitting to aggressive demands and removing requirements for age appropriate behaviour. They may use less reinforcement, and/or not be specific about reinforcement to shape pro-social behaviour. Children with behaviour disorders are also "socially unskilled". They may lack opportunities to practice pro-social behaviour, not have access to

appropriate models at home, and/or not have opportunity to practise these behaviours because they are rejected by their peers.

There were four aims to the professional development programme:

- to reduce the positive reinforcement for coercive and antisocial behaviour;
- to reduce the negative reinforcement for coercive and antisocial behaviour;
- to increase the positive reinforcement for pro-social behaviour; and
- to increase parental and teacher monitoring of the child to enable consistent differential treatment of pro-social behaviour.

Pilot programme

In a pilot study in a Christchurch kindergarten, teachers used the three stage screening process to select two children with behaviour problems. A control group of three children who were rated not difficult to manage was established.

Independent observers were trained to record:

- positive responses to appropriate child behaviour, and negative responses to inappropriate child behaviour; and
- appropriate child behaviour, inappropriate child behaviour, and non-engaged behaviour.

"Appropriateness" was determined for the setting after discussion with the teachers.

The training programme comprised six workshops 90 and 120 minutes in length, held over a 4 week period. These covered an "ABC" analysis of behaviour, observation and recording skills, problem analysis and goal setting, procedures for increasing and decreasing responses to behaviour, teaching new social behaviour, and maintenance. A common format was followed in each workshop: discussing the performance of teachers in practising the skills they had been taught; discussion and questions related to a study unit which the teachers had read before the workshop; practical activities (use of videotape, role plays, and discussion) that enabled teachers to practise the skills; and clarifying practical requirements for work with target children.

Teachers were asked to monitor the target children, attend to and respond to appropriate and inappropriate behaviour, and monitor each other to provide professional feedback and support for appropriate changes in teacher behaviour. A tape recorder "bleeped" every three minutes, to prompt the teacher to locate and respond to the target children's behaviour (teachers took turns at doing this). Teachers set the behavioural goals and decided on reinforcements and sanctions they thought would be most effective with each child. They chose to increase social reinforcement.

In post-training interviews, teachers all said they thought the training had changed the way they managed the target children, and that there was significant improvement in the target children. They made positive comments about the experience, and two teachers thought the training had helped them refocus on the positive behaviour of children.

However, observations by the researcher showed little effect on the teachers' management behaviour. Changes in children's behaviour were inconsistent and did not relate to change in teachers' behaviour.

Langley attributed the lack of impact to two reasons:

- that the teachers did not implement the training appropriately; and
- that the researcher did not give regular and specific feedback: teachers were asked to do this themselves. There were also some practical difficulties – the tape recorder bleep was hard to hear, and teachers were interrupted at times when they were supposed to discuss their performance.

The training programme was modified as follows:

- allowing the teacher more time to practise locating the child before any form of intervention;
- providing a more active and directive role for the trainer in problem analysis, goal setting, and treatment design stages of training;
- identifying and implementing a criterion of acceptable performance for positive teacher responses to the appropriate behaviour of target children (a positive response every 5 minutes);
- use of a more effective prompting device; and
- gradual transfer of control of the programme from the trainer to the teachers.

Four experiments

Experiments in four kindergartens showed that the new training programme and practice and support programme, which incorporated the above modifications, were associated with change in both teacher and child behaviour. The new programme followed a baseline phase, training phase, implementation phase, and follow-up phase. Six workshops were held over three and a half weeks, with a follow up visit after a further week. Teachers were asked to observe and track children after workshop 2, agree on goals for specific children after workshop 3, and implement interventions after workshop 4. Observations took place over 33 days. This is a relatively short time for a professional development programme.

In each of the four experiments different approaches to giving feedback were followed. Experiments 1 and 3 had a Criterion of Acceptable Performance (CAP) for the positive responses of teachers. In all experiments the researcher gave the teachers feedback, except in experiment 3 where the teachers were asked to deliver it. In all experiments the feedback was on changes to the teachers' behaviour, except experiment 4 where the feedback was on changes to the children's behaviour.

Types of feedback are set out in Table 2.

Table 2

Different approaches to giving feedback during training to teachers working with children with severe behaviour disorders

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Type of feedback	• Feedback from researcher contingent on changes to teacher's behaviour. • Criterion of Acceptable performance (CAP) for teacher's behaviour.	• Feedback from researcher contingent on changes to teacher's behaviour. • No CAP.	• Feedback from teacher contingent on changes to teacher's behaviour. • CAP.	• Feedback from researcher contingent on changes to child's behaviour. • No CAP.

Each of the four experiments led to change in teacher behaviour. There was an increase in the rate of positive responses, a decrease in the rate of negative responses, and use of a time out ("sit and watch") procedure for three children.

There was an increase in differential attention achieved by the teachers in each kindergarten.

There is some indication that differences in provision of feedback may have had an impact on teacher behaviour. In experiments 1 and 3, where a criterion of acceptable performance was given, the teachers generally attained the level required. There was greater variability for the teachers in the other two experiments.

> *It seems clear from the results that in those experiments where a CAP was set, and where the feedback given to the teachers was contingent upon their achieving this CAP, the rate of positive responses to target children reached higher levels more consistently than it did in the experiments where no CAP was required (Langley, 1997, pp.202-203).*

Changes in teachers' behaviour were associated with changes in children's inappropriate behaviour (as a percentage of recorded intervals). These changes in inappropriate behaviour are set out in Table 3. They indicate that all children, except those in experiment 4 significantly reduced their levels of inappropriate behaviour.

Table 3

Changes in children's inappropriate behaviour

	Experiment 1 %	Experiment 2 %	Experiment 3 %	Experiment 4 %
Inappropriate behaviour of Child 1				
Base line	17.5	8.2	12.3	18.1
Implementation	5.5	3.5	3.3	11.4
Follow-up	6.4	5.0	3.8	11.2
Inappropriate behaviour of Child 2				
Base line	4.8	9.9	7.3	11.2
Implementation	1.7	3.5	4.4	9.0
Follow-up	2.2	2.4	5.0	11.2

Langley suggested (p.208) that children identified as being within the "normal" range may engage in inappropriate behaviour up to 5 percent of the time. This was based on the percentage of inappropriate behaviour observed in the control group of children. On this basis, the intervention was "successful" at follow-up time for five of the eight target children. Greater positive contact between target children and their peers was another common feature.

Langley noted that children may need to be directly taught appropriate behaviour and that once new behaviour is acquired, it needs to be practised and continually reinforced.

Conclusions

The study is useful in helping extricate the features of professional development that make a difference in helping teachers change their responses to children with behaviour disorders. Differences between the pilot experiment, which was associated with no tangible change in teacher or child behaviour, and the four experiments, where change in teacher responses and child behaviour occurred, were a higher level of trainer direction, prompting, and feedback.

Langley concluded that prompting, practice, and feedback are necessary conditions for acquiring new teaching skills, and that it was desirable to set a criterion of acceptable performance. He suggested that this ongoing, structured approach, with teachers practising and receiving prompting and feedback in natural settings, worked better than either short or long off site courses such as a seminar or workshop presentation.

Summary

Carr's Learning and Teaching Stories, Jordan's (1999) study, the Swedish studies (Palmerus & Pramling, 1991; Pramling, 1996; Pramling Samuelsson et al., 2000) and the EEL programmes (Palmerus & Pramling, 1991; Pascal, 1999; Ramsden, 1997) have in common a fundamental focus on children's experiences at a deep and specific level, and adult interactions related to these. The studies all involved an emphasis on children's interests, skills, and thinking, and ways in which

adults could extend these. In all studies, change occurred when adults were encouraged and given tools to analyse their own interactions and extend them, e.g., by focusing on the child's questions (Carr et al., 2000), by expanding or going beyond the here and now (Palmerus & Pramling, 1991; Pramling, 1996), by scaffolding or targeting the child's knowledge and stretching it out to a higher level (Jordan, 1999), and by responsive interactions that encouraged the child's involvement (Palmerus & Pramling, 1991; Pascal, 1999; Ramsden, 1997). This may be a core reason why the impact of these approaches on teachers/educators' interactions was marked. In keeping with socio-cultural theory, one implication is that this type of professional development is likely to have an impact on children's learning.

There is evidence (Carr et al., 2000) that approaches that assist teachers/educators to find out about a child's thinking, family experiences and competence can challenge deficit assumptions around ethnicity and income, and help strengthen continuities between home and centre. This indicates one way, through professional development, that teachers/educators may better understand families' cultural traditions and practices when these are different from their own. Shifting from a deficit view, and addressing the mismatches between early childhood education and home experiences will assist in ensuring positive outcomes for diverse children. A similar shift to an empowering view of children was at the centre of changes noted by Pramling (1996) and Palmerus and Pramling (1991) where teachers/educators became more aware of their roles as teachers/educators in toddler centres, changing their views about the needs for education (rather than care) of toddlers following a theoretical course and intensive analysis and discussion of video recordings of adult/ child interactions.

Evidence discussed by Timperley and Robinson (2001) of the micro-processes involved in changing teachers' beliefs and practices about new entrants in four schools in Otara and Mangere indicated that three conditions were critical:

- the salience of discrepant data;
- the presence of an external agent to assist with data collection and interpretation; and
- the availability of information on alternative practices.

In these schools, teachers initially underestimated children's or parents' knowledge and skills, and attributed low student achievement to external factors, such as children's and parents' deficits.

Many of the professional development programmes reported in this section illuminated tools and processes that work for a group of diverse children because they allow in-depth examination of interactions according to criteria related to effective pedagogy, e.g., programme evaluation starting from a child's question reflecting one of the 5 strands of Te Whäriki (Carr et al., 2000), recognition of the need for close observation as a diagnostic tool highlighted in the Principles into Practice in Early Childhood Education Project (Blenkin and Kelly, 1997) and use of video and analysis of interactions according to mediational categories (Pramling, 1996; Palmerus and Pramling, 1991).

Some of the professional development programmes targeted teachers working with individual children (e.g., Langley, 1999) while others had broad applicability, strengthening pedagogical approaches that are able to work simultaneously for more than one child and are shown through research evidence to be associated with good outcomes for all children (e.g., scaffolding and co-

constructing learning, mediating learning experiences, adult engagement and involvement, action research related to the child's questions). In these, the professional development links closely to ensuring effective pedagogy with a group of diverse children and provision of differentiated curriculum experiences. A key implication is that if professional development is intended to promote learning opportunities for all children, it needs to focus on characteristics of quality teaching (e.g., Farquhar (2003) has addressed the question "What works in early childhood teaching for maximising children's learning and reducing disparities among diverse children?")

The professional development related to self-review using *The Quality Journey* (Depree & Hayward, 2001; McLachlan-Smith et al., 2001; Ramsden, 1997) and action research (Blenkin & Hutchin, 1998; Blenkin & Kelly, 1997) had a variety of goals, only some of which related to teaching and learning. If an aim is to influence adult/child interactions directly, these need to be the goals of the professional development. However, it seems that a helpful condition is for teachers/educators to be committed to the goals of the professional development programme. This occurred in the studies under review through teachers/educators developing the goals themselves, having a great interest in the educational practice being addressed by the programme, and/or analysis of their own teaching and recognition of a need to change their styles.

A feature for all the programmes described here was the active and collaborative involvement of participants, and use of tools and support (personnel and/or structures) to enable them to step outside the busy life of the centre to analyse their own practice. The teachers/educators worked on examples of their own experience: the professional development was grounded in meaningful and real examples. Teachers/educators worked either with a professional development adviser or with a collaborative researcher, who contributed another view, and theoretical ideas. In common, these professional development programmes had an emphasis on reflection and analysis of teachers' own work, using tools of action research or video analysis and discussion. In addition, Jordan (1999) made use of radio microphone and computer. In these studies, participants were intensely involved, and challenged by their investigations into their interactions.

Professional development focused on complex theoretical concepts and adult/child interactions took place over an extended time period, mostly for longer than 12 months. There was evidence that longer time periods were desirable for those who started with little theoretical understanding, practical experience or low levels of confidence (Carr et al., 2000; Pascal, 1999). Pascal (1999) also stated that those teachers/educators who need to make fundamental improvements could need a longer timeframe. Duration and intensity of professional development is examined in the final section of this synthesis, where evidence from all studies is brought together.

In combination these studies provide powerful evidence that professional development aimed at influencing teachers/educators' interactions with children can support them to become more focused on children's ideas and theories, helping them extend children's thinking and promote learning dispositions. The results apply across a range of early childhood settings, and with children from different socio-economic and cultural backgrounds.

Langley's (1997) evidence indicated that early childhood teachers can be taught through professional development to change their interactions with children with severe behaviour disorders so that they positively reinforce appropriate behaviour, reduce both positive and negative reinforcement of coercive and antisocial behaviour, and monitor the individual child.

Teachers were required to closely observe the child and adapt their responses to the observed behaviour. The professional development was successful in changing teacher behaviour and in reducing inappropriate behaviour when a number of features were present:

- The trainer played a directive role in problem analysis and setting goals.
- The professional development programme included well designed cueing so that teachers were prompted to respond to the child at regular intervals.
- In the most successful programmes, performance criteria for teachers' performance was set and then monitored by the teacher, and feedback about the teacher's performance was specific.

Unlike other studies showing outcomes for professional development, changes were achieved over a relatively short period of time, i.e. 4½ weeks. The reason for this success may have been the focus and prescriptiveness of the programme, and intense involvement of the trainer in setting targets, observing, and giving feedback.

Some framing conditions seemed to influence the capacity of adults to benefit from the professional development programme. Working with staff who are trained as early childhood teachers provided a knowledge base from which to build and professional development is not a substitute for basic training. Taking a whole centre approach meant all adults could develop shared understanding and take consistent approaches. On the other hand there were tensions and issues in this approach when not all participants were motivated or trained to the same level.

McLachlan-Smith et al. (2001) asked about the nature of professional development that is most helpful for services with a mix of teachers/educators holding a variety of training backgrounds. Likewise the Principles into Practice study (Blenkin & Hutchin, 1998; Blenkin & Kelly, 1997) noted the difficulty of working with individuals and groups with different needs. This issue is significant in settings in New Zealand and warrants further exploration through research.

STAFFING LEVELS ARE IMPORTANT BECAUSE THEY ENABLE STAFF TO INTERACT CLOSELY WITH INDIVIDUAL AND SMALL GROUPS OF CHILDREN. IN TWO STUDIES (DEPREE & HAYWARD, 2001; PALMERUS & PRAMLING, 1991; PRAMLING, 1996) STAFF WERE ABLE TO CREATE BETTER CONDITIONS FOR CHILDREN BY INTERNAL RE-ORGANISATION RATHER THAN EMPLOYING ADDITIONAL STAFF. IN THE PRAMLING AND PALMERUS STUDY THE CENTRE WAS RE-ORGANISED SO THAT CHILDREN WERE EDUCATED IN SMALLER GROUPS WITH A SINGLE STAFF MEMBER, AND IN THE DEPREE AND HAYWARD STUDY STAFF RE-ORGANISED MORNING TEA TIME TO ALLOW GREATER INTERACTION WITH CHILDREN. THESE CHANGES APPEARED TO BE RESULTS OF INSIGHT FROM THE PROFESSIONAL DEVELOPMENT PROGRAMME.

PROFESSIONAL DEVELOPMENT AND OUTCOMES FOR CHILDREN

Theoretical understanding and pedagogical content knowledge

Te Whäriki is founded on aspirations for children:

> *To grow up as competent and confident learners and communicators, healthy in mind, body and spirit, secure in their sense of belonging and in the knowledge that they make a valued contribution to society (Ministry of Education, 1996, p.9)*

There are four broad principles underpinning the early childhood education curriculum. These are that the curriculum empowers children to learn and grow, reflects the holistic way children learn and grow, includes the wider family and community as an integral part, and that children learn through responsive and reciprocal relationships with people, places, and things. Strands and goals arise from these principles. The five strands in Te Whäriki are:

- exploration/Mana Aoturoa – The child learns through active exploration of the environment;
- contribution/Mana Tangata – Opportunities for learning are equitable and each child's contribution is valued;
- communication/Mana Reo – The languages and symbols of their own and other cultures are promoted and protected;
- belonging/Mana Whenua – Children and their families feel a sense of belonging; and
- wellbeing/Mana Atua – The health and wellbeing of the child are protected and nurtured.

Interwoven together, the principles and strands form the curriculum framework. This is an integrated foundation for learning and development which is grounded in social and cultural contexts. Attitudes to learning and learning dispositions are portrayed as going hand in hand with skills and knowledge.

Te Whäriki is underpinned by Bronfenbrenner's (1979) model of human development emphasising connections between contexts that impact on the child's wellbeing and capacity to learn. On balance, Te Whäriki takes a socio-cultural view of learning:

> *The curriculum emphasises the critical role of socially and culturally mediated learning and of responsive and reciprocal relationships for children with people, places, and things. Children learn through collaboration with adults and peers, through guided participation and observation of others, as well as through individual exploration and reflection (Ministry of Education, 1996, p.9).*

Theoretical understanding

Te Whäriki emphasises a view of learning as being about reciprocal relationships and participation rather than skills and knowledge. It is significantly different from other curricula in

focusing on children's learning dispositions and theory building as content, as well as expecting teachers to weave in early literacy and mathematics and other traditional content. Cullen has argued (1996) that without quality training and ongoing professional development "the abstract concepts and sophisticated body of knowledge of Te Whäriki's rationale and structure are likely to be major impediments to curriculum implementation" (p.122). Teachers/educators may interpret the guidelines on the basis of current practice and miss the theoretical richness of Te Whäriki. Teacher education and professional development providers also require a broad and in-depth theoretical and conceptual knowledge base.

There is evidence that early childhood teachers/educators do need to have a good grasp of the theory and concepts underpinning Te Whäriki. Haggerty and Hubbard (1994) in their report of a research based trial of the draft Te Whäriki guidelines in five early childhood centres identified a number of factors that helped centres to use the guidelines. These included:

- having a degree of familiarity with the document, particularly understanding the curriculum approach underpinning the guidelines;
- taking an "adaptive" rather than an "adoptive" approach. The notion of curriculum as tightly prescribed is rejected in Te Whäriki's approach. "The concept of Te Whäriki, or an early childhood programme as weaving, implies there is no set way to develop a programme" (Carr & May, 1993, p.129). Some participants wanted a recipe to follow and although they knew this was not a workable approach, they did not know how to approach the task differently.
- having outside facilitators who encouraged an adaptive approach; and
- having time for reflection, planning, and evaluation and being able to engage with the guidelines. Factors that assisted this process were a centre culture that accepted the need for ongoing change, manageable workload, high staff/child ratios and small group sizes, trained staff, staff stability, and a supportive leadership.

These factors suggest that conceptual understanding of Te Whäriki is required for effective implementation.

Professional development and Te Whäriki strands and goals

Outcomes of Te Whäriki have not been part of research evidence on the impact of professional development in New Zealand.

However, there was evidence in a Swedish and two UK studies, of linkages between professional development and Te Whäriki outcomes.

A Swedish study in three childcare centres (Pramling, 1996) demonstrated change in child initiated communication, and transcendence by the child (expanding or going beyond the here and now) when teachers/educators took part in a professional development programme aimed at improving the quality of adult mediation between the child's experiences and the environment. These have been reported on pp. 22–25.

The UK Effective Early Learning Project (Mould, 1998; Ramsden, 1997) demonstrated change in child involvement when teachers/educators took part in an action research programme using

observation of children's levels of involvement in activities and the qualities of adult interactions with children. These have been reported on pp. 28–29.

Content knowledge

The area of pedagogical content knowledge is important for the Pasifika sector because the challenges are not only to maintain Pasifika culture and languages, but also to prepare children for living in the global community. Pedagogical content knowledge for Pasifika settings and Pasifika educators needs to centre around the Pasifika languages and the cultural values and practices promoted through the languages.

Siraj-Blatchford et al.'s (2002, p.67) investigation of effective early years settings found that "pedagogical content knowledge", defined as "the way we make the knowledge accessible and understood to others (the children)", was an essential element of effective pedagogy. They found more of the time was devoted to literacy, numeracy and physical development activities in the most effective pre-school centres. Their study found missed opportunities or uncertain outcomes in examples where teachers/educators' knowledge and understanding of the particular subject area being addressed was inadequate. They gave examples of inadequate knowledge and understanding in phonics work, mathematics and science, and design and technology.

In most early childhood settings, they noted that most letter sounds were being identified, but that this is not sufficient for "good pre-reading outcomes" (Siraj-Blatchford et al., 2002, p.67). To illustrate some of the problems they observed, they gave an example of a child's interaction with a teacher who decontextualised phonics work from the child's experiences, displayed that she did not understand how children learn reading, e.g., the teacher thought the child needed to learn the letters in the word after learning the whole word, and used inappropriate testing rather than teaching. In a science example they showed how the teacher had little understanding of the importance of explanation and made no attempt to identify the reasons children had for making predictions or to engage with those reasons; in a design and technology example, that the teacher had little understanding of the importance of evaluation, offering no attempt to assist children to overcome difficulties to realise their original design intentions or to give constructive feedback, with children only being required on completion to show that what they intended to stick in place had indeed been stuck. While they also noted many examples of good practice, they said there was sufficient evidence to show that early years staff could be helped to develop their subject knowledge and knowledge of how to scaffold children's learning.

Other studies have shown that some teachers/educators have limited knowledge and understanding about early literacy (G. Phillips, S. McNaughton, & S. MacDonald, 2002; Raban, Ure, & Smith, 1999; Ure & Raban, 2001), mathematical development (Peters, 2001; Young-Loveridge, 1993; Young-Loveridge, Carr, & Peters, 1995) and the role the teacher can play in extending children's experiences and thinking. There is evidence that some teachers/educators are lacking in confidence in their knowledge of science and their role as teachers (Watters, Diezmann, Grieshaber, & Davis, 2001; Watters & Ginns, 1995). Professional development approaches that integrated content and theoretical knowledge with teachers/educators' understanding of teaching and learning and pedagogical practice were beneficial in supporting change.

A number of studies have provided evidence of the influence of professional development on teachers/educators' pedagogical content knowledge. We found evidence about linkages between

professional development and literacy development, and professional development and mathematical and scientific learning.

Professional development and early literacy

A strand of evidence about professional development shows linkages between professional development programmes and children's literacy development. Attention to it in early childhood education is important because literacy is key to further learning and solid participation. However all the evidence provided here is about literacy in the English language: there is a gap in evidence related to professional development and linkages to languages other than English, which would include te reo and Pasifika languages.

> *Being literate enables and strengthens the ability to communicate, to gain access to and to understand other fields of knowledge, to be creative – to take existing knowledge and transform it (David et al., 2000, p.2).*

Clay (1975) identified that having awareness of print before children start school makes learning at school easier for them.

Pedagogical approaches and contexts for early literacy development

The influence of literacy experiences for developing literacy awareness

David et al (2000) point out that assumptions that small children should not engage in literacy may deprive them of access to understandings that will underpin their later formal learning in primary school. In their view, what is important is the teaching approach to literacy and the need for the child to co-construct knowledge about literacy. They argue that if early childhood services do not provide opportunities for literacy experiences, then there will be little opportunity for children from homes with few experiences of literacy to develop literacy awareness. They note a move from early conceptions of pre-reading and pre-writing to a concept of early literacy which "captures the essence of developing awareness and understanding of the wider functions and variety of both reading and writing" (p.38). This latter concept emphasises the child's construction of literacy strategies within the context of their daily lives.

Neuman and Roskos (1997) report evidence that children make discoveries about written language through active engagement with their social and cultural worlds, developing knowledge about the forms and functions of written language through meaningful activities. Environments that are rich in written language provide natural opportunities for children to be engaged in literacy related events. In their investigation of 3 and 4 year olds' literacy activities in play settings, they found key features of context that supported literacy were the presence of other people, feedback from others, access to literacy tools, multiple options for activity, and purposeful situations other than literacy learning itself. Neuman (1999, p.289) noted from such findings the need to "increase the volume of children's playful, stimulating experiences with good books".

Esler (2001) identified practices in childcare centres that have evidence based support for building language and social skills. In her review, she highlighted the Home School Study of Language and Literacy Development as a major study designed to identify childcare and home practices

related to higher language and literacy scores. She cited evidence about this study (Dickinson, Cote, & Smith, 1993; Dickinson & Smith, 1994; Dickinson & Tabors, 1991) as indicating that:

- conversations in individual time with teachers about things that interested children increased children's vocabulary skills; shared book reading enhanced children's vocabularies, story comprehension, and sentence level language skills; and activities involving children dictating stories for teachers to write down were correlated with print-related skills;
- small group time was conducive to cognitively rich conversation;
- when teachers allowed for rich discussion before, during, and after reading stories, children showed higher vocabulary and comprehension skills than when teachers asked children to repeat a phrase or recall questions;
- rhyming poems and singing in large groups helped build language skills; and
- asking open-ended questions and expanding children's language correlated with print-related skills at age 3 and story comprehension and vocabulary at age 4.

Esler also identified evidence (Dunn, 1993) that enriching environments with print-related materials led to an increase in literacy activities and increased ability to read environmental print.

Children's differential access to literacy resources, activities, and interactions

The Competent Children study found that children from low income homes, or homes with low parental qualifications (the two overlapped), were less likely to engage in activities involving reading, writing or number, and had a narrower range of family activities. These findings are similar to those reported by Neuman and Roskos (1997) who described the importance of story books in children's literacy development and pointed to the disparities existing among US middle and low income communities in resources available in homes and early childhood settings. They cited Adam's (1990) estimate that a typical middle class child enters first grade with approximately 1,000 hours of being read to, while the corresponding child from a low income family averages just 25 hours.

Literacy practices in early childhood services: New Zealand evidence

Early childhood centres have the potential to make literacy resources, activities and interactions available to all children who attend. In New Zealand, there is evidence that more could be done. Only a few of the early childhood centres in the Competent Children study scored a 4 or 5 out of 5 for providing a print-saturated environment.

> *A centre which scored full marks for this item would have print visible on a variety of surfaces, such as posters, packets, charts, containers, and at child's eye level or just above. Much of the printed material would be child focused. There would be a range of books readily accessible to children, and children would be encouraged to listen to and read stories, look at books and be aware of print in use (Wylie, 2001, p.12).*

Likewise, McLachlan-Smith, St George, and Turner (1995) found a gap in the "rhetoric of literacy in the curriculum and the observed practice" (p.149) in 12 New Zealand kindergartens. Interviews

with head teachers indicated that they thought literacy was an important part of the curriculum. Observations found that literacy activity was apparent but it was spread unevenly across and within kindergartens. Specifically, some examples were that:

- Print was a large feature of the kindergartens, but a significant proportion was directed at adults, not children.
- All the kindergartens had books displayed at children's level, but some were not displayed so they could be seen and be easily accessible, one had only a small selection of books and not all the kindergartens used a library system.
- Writing materials were all available near the collage table and implicitly connected with art work.

McLachlan-Smith et al. argued for ways in which teachers could create more awareness about concepts of print, and letter and phonemic awareness, without compromising their beliefs, e.g., greater attention to the types and purposes of print, greater encouragement of children's interest in literacy, and attempts at reading and writing within scaffolded teacher/child relationships.

Literacy practices in early childhood education: international evidence

Similar conclusions were drawn by Neuman and Roskos (1997) from evidence in US studies, by Makin, Hayden, and Diaz (2000) from evidence in an Australian study, and by Esler (2001) from an extensive review of the literature on effective childcare practices.

Findings in the Australian study of literacy practices in 79 early childhood classrooms (pre-schools classes attached to schools and daycare centres) in New South Wales (Makin et al., 2000), based on observations using an Early Childhood Language and Literacy Scale, interviews with two staff in each classroom, and focus group interviews with parents, showed:

- While classrooms were inviting and staff-child interactions were warm, support for early literacy development (e.g., literacy links in play and the development of metalinguistic awareness) was not strong.
- Families and staff did not have congruent perspectives about early literacy, especially where families and staff did not share language and/or culture. In these cases staff often made deficit assumptions about children's and parents' language and literacy ability.
- Most staff did not possess sufficient knowledge about the impact of information technology and popular culture on early childhood literacies, while families were aware of these.
- Staff did not understand the notion of literacy as social practice.

The study explored differences between the five highest ranking classrooms (using information from the three data sources to rank classrooms) and the five lowest ranking classrooms to explore factors that might help early childhood staff provide environments that are supportive of literacy. In high ranking classrooms:

- Stated understandings and beliefs were translated into observed practices. This was not so in low ranking classrooms although these staff did not seem to lack knowledge about literacy practices.

- Staff were more experienced and the teaching assistants had post-secondary training, while in four of the five low ranking classrooms they had no post-secondary training.
- Staff reported that early childhood literacy development is important as a life skill, while those in low ranking classrooms tended to view the value of literacy development in terms of school readiness goals.
- Staff were more likely to report on the importance of literacy in the child's home language. Staff in low ranking classrooms placed less emphasis on the home language if it was other than English.
- Staff used general strategies such as interaction, observation, and encouragement to facilitate literacy development. Staff in low ranking classrooms were more likely to use interaction only as a strategy for children with perceived literacy problems.
- Staff were twice as likely as those in low ranking classrooms to report on the importance of verbal interactions when discussing literacy strategies.
- Staff were more likely to have a positive encouraging environment for all children, while in low ranking classrooms they tended to focus on children seen as having problems.
- Staff acknowledged the role of parents slightly more than in low ranking classrooms. In one focus group of parents whose first language was Arabic, (a low ranking classroom), "staff disregarded the children's bilingual/bicultural experiences, and seemed to view the parents' and children's experiences with literacy outside the pre-school, as insignificant, and, if anything, problematic" (p.372).

From these features, Makin, Hayden, and Diaz concluded that teacher education and professional development programmes need to ensure close links between theory and practice, offer assistance in developing a positive approach to diversity, and develop strategies for two-way communication with parents. Staff need knowledge of some areas, e.g., the role of bilingual and biliteracy development and the role of technology and popular culture in literacy development.

In addition, strengthening teachers/educators' knowledge of their own language and culture is a basis for appreciating the culture of others – emphasising similarities as well as appreciating differences. We found no evidence of professional development programmes related to teachers' work in these areas and this would seem to constitute a gap in research and in professional development programmes.

Evidence of impact of professional development on children's early literacy development

There is strong evidence that professional development for early childhood teachers focused on aspects of language and literacy learning has a positive impact on aspects of children's literacy development for children in low income communities, at the time of the professional development and in the medium term. Studies in New Zealand (G. Phillips et al., 2002), Australia (Raban et al., 1999; Ure & Raban, 2001), and the US (Neuman, 1999) have incorporated a longitudinal component to show that gains in children's literacy development can be attributed to changed teaching as a result of their teachers' participation in professional development programmes. Gains were enduring one year after children attended school for the New Zealand and Australian studies and six months after attending kindergarten (equivalent to a new entrant class in a New Zealand primary school) in the US study. The New Zealand and Australian studies used combined

professional development programmes with primary and early childhood teachers. There was evidence in the New Zealand study of advantage for some students in the combined professional development programme over and above single professional development interventions for early childhood or primary teachers.

A New Zealand professional development programme for early childhood and primary teachers: impact on achievement

Phillips, McNaughton, and MacDonald (2002) studied the impact on children's achievement of a professional development programme for teachers in early childhood centres and teachers in the first year of school. Thirty-seven early childhood teachers from 15 licensed and chartered early childhood centres (eight kindergartens, five Pasifika early childhood centres, one school based centre, and one church based centre) took part. Forty-six percent of the early childhood teachers identified as Pasifika, 38 percent as Päkehä, and 16 percent as Mäori. The 73 primary teachers came from 12 schools. Forty-five percent of these identified as Päkehä, 25 percent as Pasifika, 11 percent as Mäori, and 19 percent as other. The children were from a cluster of decile 1 primary schools in Otara and Mangere, and from early childhood centres that had children going on to these schools. Over 90 percent of the children in these communities are Mäori or Pasifika. The children attending early childhood centres were all aged 4 years 6 months at the start of the project.

The programme aimed to improve the children's literacy achievement, and specifically to help them achieve at expected levels for their age at school entry and at 6 years. Professional development focused on enhancing the teachers' literacy programmes and improving the links between early childhood centres and schools. The professional development was delivered separately for the early childhood teachers and for the new entrant teachers, with some joint sessions focusing on the transition to school. Professional development sessions of two hours every two weeks took place over two terms (a total of 20 weeks for each group).

Characteristics of the professional development

The focus of the professional development for *early childhood teachers* was, first, on developing teachers' ideas about literacy, their ideas about teaching, learning, and development, and their goals for their children's development. Secondly, activities that promoted literacy and language in school settings were identified (reading to children, guided reading, and telling or retelling stories). Thirdly, early childhood teachers discussed their children's development over the last six months before school in relation to known profiles at school, with the object of having shared understanding about the patterns of development that are possible.

The first professional development sessions established aims, discussed literacy development in the year before school, explored teachers' expectations of "profiles of children's learning" before school and compared these with national profiles, and discussed baseline measures of the children at 4 years 6 months.

Subsequent sessions focused on specific activities:

- Reading to children. Different styles of reading were identified – narrative style, focusing on narrative meanings, performance style, where part or all of a sentence is imitated or

completed, and item learning, where attributes of the text or pictures unrelated to the meaning are identified. The professional development stressed that a narrative style is more suited to developing comprehension and language use. Goals of engaging in the activity at least three times a week were set.

- Guiding writing. Forms of guidance for writing and ways of conversing with children to elaborate their language were discussed.
- Telling or retelling stories. The aim was to develop children's understanding of and fluency with narrative.

Goals of engaging in the activity at least three times a week were set. Types of guidance, learning outcomes, and observing and recording children's learning were stressed for each activity. Teachers brought activities for discussion.

Two sessions were held in common with primary teachers in schools involved in the professional development at the same time, where strategies for enhancing transition, incorporating literacy practices, and adding to literacy practices were discussed.

The *primary teachers'* professional development aimed to change teachers' beliefs about language, learning, and literacy. Teachers compared their own students' achievement data with known standards, discussed strengths and problem areas, analysed biases, and set expectations. They developed an in-depth understanding of language literacy and learning through theoretical discussion, observation, and analogy. Teachers explored and implemented alternative or refocused practices in the classroom. Over time they developed a shared view of effective practice for new entrants.

> *This involved teachers:*
>
> - *having greater awareness of the behaviours that signal children's understandings of the task, and hence an awareness of the relevance of experience and strengths in language and literacy that children bring to school;*
> - *helping children make connections between school literacy and children's diverse social worlds and understandings especially in writing;*
> - *being able to observe children's behaviour in reading and writing in more specific and focused ways in order to draw children's current strengths into the acquisition process; and*
> - *learning how to monitor their own reading and writing behaviour (D. Phillips, S. McNaughton, & S. MacDonald, 2002, p.8).*

The report, however, did not specify how teachers helped children make connections between school literacy and their social worlds and understandings.

Evidence of impacts

Planned comparisons were made. For the early childhood comparisons:

- Children in the early childhood intervention group were compared at the start of school, with a group of children who had come from an early childhood service to the same school 6 months earlier (the "new entrant group"). In most cases these children attended the same services as those in the early childhood intervention group, but the teachers had not at that time undertaken the professional development.
- Children in the early childhood intervention group were compared with a) children in a new entrant primary school intervention group at age 5.6 years and age 6.0 years, and b) children in the same primary classroom but without the primary intervention at ages 5.6 years and age 6.0 years.

Early childhood intervention

On entry to school, children from centres with the early childhood intervention had significantly higher scores on measures of literacy and language (concepts about print, writing vocabulary, Peabody Picture Vocabulary Test, retelling task), than the new entrant group at 5.0 years that had had some early childhood education, but no intervention. They were close to expected levels for children on entry to school in New Zealand for concepts of print and exceeded expected levels in the retelling task. These were the focus of the professional development. The intervention was effective with Mäori and Pasifika children. The intervention added to teachers' knowledge and practices.

At 5.6 years, children who had been in the early childhood intervention group had somewhat higher scores on the above measures than those who had been in the new entrant intervention group only. At age 6, the significant gains for the early childhood intervention group were seen in the measures for concepts about print only and there were no differences in reading of continuous text and writing measures. The Peabody Picture Vocabulary, writing vocabulary, and retelling language measures, for which there had been marked effects at age 5, were not used at age 6 years.

New entrant intervention

There were significant gains for children in the new entrant intervention group across a broad range of literacy levels (reading and writing, text and item knowledge) over baseline measures and over the non-intervention group at age 5.6 and 6 years.

Early childhood/new entrants intervention combined

There were some additional advantages for children who had the combined intervention at age 5.6, but these were only in areas in which there had been significant differences on school entry. By age 6 there were only advantages for the combined group in the concepts about print measure.

Features contributing to success of the programme

The success of this professional development programme in raising children's literacy achievement on some measures seems able to be attributed to a number of features:

- The theory of education underpinning the approach is an empowering theory. Children from low income and Mäori and Pasifika communities were not regarded as deficit in readiness, understanding, or experience, but as having different literacy and language experiences from those captured in indicators of conventional literacy practices.
- The programme drew on "rich text activities" – "books written to engage children's interest, which draw on their cultural and social identities, are used for a range of purposes, but with meaning as central" and activities for writing texts for a range of purposes (Phillips et al., 2002b, p.16). It would have been helpful if the details of this had been precisely spelled out through specific examples.
- The professional development helped raise teachers' expectations of the children and changed their understanding of literacy development and of their role as teachers.

The professional development programme drew on Bronfenbrenner's (1979) ecological view of human development in its aim to strengthen linkages between school and early childhood centre. Providing a better match between early childhood centre and school practices is one way to offer coherent and familiar literacy activities. These in turn, if they are based on the child's experiences, will better support children from diverse cultural and language backgrounds.

Further professional development and research was recommended

Some early childhood centres, most of which were the 30 Pasifika language groups in the area, did not take part in the intervention. Phillips et al. (2002b) recommended that professional development programmes be extended to all non-participating centres, that there should be further research to understand the development of language and literacy in Pasifika children in language groups and at school, and further development of assessment tools for languages other than English.

Australian findings from "The Pre–School Literacy Project" (Raban et al., 1999; Ure & Raban, 2001)

The Pre-school Literacy Project in 40 pre-schools in Victoria, Melbourne, was planned to run in parallel to the Early Literacy Research Project (ELRP) for schools serving areas of social, economic, and educational disadvantage. The pre-schools contributed to the ELRP schools and in most cases were one teacher units with a teacher aide. Unlike New Zealand, the pre-schools in Victoria are administered by the Department of Health and Community Services, which is more focused on regulations than curriculum.

There were three stages to this project over the years 1996 to 1999. Stage 1 gathered information through a postal survey and interviews about pre-school teachers' understanding of literacy development. Stage 2 involved these teachers in a professional development programme of workshops, goal setting, and evaluation. In stage 3 the teachers were surveyed for their understanding of early literacy development in the light of their professional development experience. The children attending the pre-schools and another cohort whose teachers did not take part in the professional development were assessed at the end of their first year at school.

Information about teachers' attitudes and knowledge

The stage 1 postal survey and interviews asked teachers and teacher aides questions about:

- the development of reading and writing in young children;
- teachers' concerns about the role of literacy in the pre-school programme;
- how these teachers currently included literacy based experiences in their programmes;
- what teachers would like to know about young children and literacy; and
- what teachers believed parents should do to encourage children in literacy development.

Most teachers held an overwhelming uncertainty about the role of literacy in their programmes (Ure & Raban, 2001). Most felt their knowledge about literacy was extremely limited and that their initial training had provided only limited information. They knew that methods of teaching reading and writing in schools had changed but did not know what these changes were. They were uncertain about what to advise parents in relation to early reading and writing development. Many thought that parents' expectations for their children were too high, that parents often pushed children into reading and writing too early, and used inappropriate methods. They identified current practice largely in relation to perceptual skills, which they referred to as pre-reading and pre-writing activities, e.g., eye control, and appropriate pencil grip. Literacy experiences were based on similar expectations for all children. Teachers appeared reluctant to actively develop curriculum goals for children who were interested or able to read and write, or model and promote children's attention to and use of print. None held a view of literacy as knowledge of social practices. Expectations for the development of understandings concerning print literacy were limited. A common belief was that teaching reading and writing occurred through formal processes to be done at school. As a consequence, children in these centres were not being regularly engaged in literacy based experiences.

Systemic issues that influence the programme quality and the experiences provided for literacy were explored in the interview. Teachers raised concerns about the demands placed on them by the large number of children in their programme. A typical kindergarten had one to three groups of up to 30 children a week, each attending ten hours a week. There was minimal administrative support. This arrangement meant that there was limited time for individual interactions and it was hard to develop project work that extended over a number of days. The arrangement is similar to New Zealand kindergartens, which usually operate with two groups of 30–45 children, attending sessions of from 7½ hours to 17 hours per week.

Characteristics of the professional development programme

Raban et al (1999) describe stages 2 and 3 of the Pre–School Literacy Project. In stage 2, teachers and teacher aides met together in clusters in an initial meeting (two hours) and three or four additional meetings over late 1996–1997. This formed the professional development which included:

- a session on current understandings of literacy development and what these might look like in practice. In this session teachers were asked to commit themselves to their own chosen goal for practice. Examples of goals were deciding to bring the print down to the child's eye level, introducing a post box for letter exchange, introducing literacy materials into the "home" corner". They were given a journal for their own use;

- practical networking sessions in clusters where teachers were kept in touch with new ideas and resources and discussed examples of their own practice; and
- a day conference of all teachers and teacher aides to exchange achievements and plan for dissemination.

Impact of professional development programme on Australian children's literacy development

Stage 3 asked the pre-schools teachers similar questions to those asked at stage 1 and accessed results of the ELRP students who had been at school for one year. Six hundred and thirteen of these students had not attended pre-schools in the PLP project and 347 students had attended such pre-schools. Data showed that students who had attended a PLP pre-schools had accelerated progress on a range of measures (oral language, appropriate concepts of print, phonemic awareness, writing their own words, a word test compiled from learning to read texts, the Burt word test, and running records of level texts). Differences between the groups were statistically significant. Letter identification was the only measure on which there was not accelerated progress. The authors conclude that appropriate experience of literacy during pre-school has a significant effect on literacy development during the first year of schooling.

Common elements in Australian and New Zealand literacy studies

The Australian and New Zealand studies had common elements. In both, professional development with early childhood teachers started by unravelling teachers' knowledge and beliefs about literacy development, then building understanding of literacy development and what this would look like in practice. Identifying literacy activities was a useful approach, providing a clear focus from which examples of practice could be gathered. In both studies, teachers were asked to develop their own goals related to literacy. Opportunities were provided for teachers to get together to discuss and critique their own examples of literacy practice, with a professional development adviser. All the staff in participating centres were involved.

In the Australian study, professional development was held concurrently with professional development in the schools to which the pre-school children went, although there were no shared sessions between primary and early childhood teachers. In the New Zealand study there were some joint primary and early childhood teacher professional development sessions for one group.

US book supply and professional development programme

Basing programmes on teachers' beliefs and understanding and providing a print enriched environment was also evident in a US study (Neuman, 1999). An interesting feature of this study was the poor initial implementation of professional development, which prompted trainers to tailor their approaches to the needs of participants and be more sensitive to where the participants were coming from.

Neuman's (1999) evaluation of a professional development and book supply programme in low income communities in metropolitan Pennsylvania showed how professional development focused on enhancing literacy through encouraging meaningful literacy activities and interactions and access to books could benefit 3 and 4 year olds in these communities. The Books Aloud programme described by Neuman (1999) aimed to enrich the literacy and language opportunities

for economically disadvantaged children in 337 not-for-profit childcare centres. The centres served 17,657 children aged infant to 5 years.

Study was made of 400 3 and 4 year olds in 50 centres involved in the project. Sixty-five percent of these children were in families receiving government subsidies. Ethnicity was described as Caucasian (29 percent), African American (65 percent), Hispanic (4 percent), Other (2 percent). A control group of 100 children in centres not in the programme had a similar profile.

Characteristics of the book supply and professional development programme

The programme involved a collaboration among five county library systems and the Free Library of Philadelphia. High quality books (five books per child), were chosen by centres at a preview and book talk in the local library. These were given to the centre, along with a bookcase and display units. Local libraries were given the same titles as the centres, and collaborative activities between libraries and centres were held through the year, e.g., puppet shows, story tellers, and speakers.

The training model that was developed was intended to provide monthly workshops in local libraries by pre-school specialists and some co-ordination between meetings with local centres. The specialists were to be a liaison between the library and the centres. However, the variability in centre quality, the high poverty and high crime communities of some centres, and the low levels of training of staff (few had any qualifications for teaching except high school and previous experience) presented enormous obstacles in scheduling workshops at suitable times and in making literacy a priority when "skills, socialisation, nurturance and safety were seen by the teachers as the primary goal … Although new children's books and furniture were regarded as most welcome additions to the centres, unknown trainers bringing largely imported content were not greeted with open arms" (p.294). Poor implementation led to the trainers rethinking their approaches.

Important lessons were learned:

- Training goals needed to be differentiated.
- Staff development designed to enhance reading aloud and alter heavily skill-based instruction needed to acknowledge and work within teachers' beliefs.
- Some centres would not take advantage of the training unless it was on site.

A more context-specific training and support model of workshops in centres was developed, focusing on developmentally appropriate practice, storybook read aloud techniques, story stretcher (stretching ideas to make greater meaning) techniques, and ways to enhance the physical environment to access books.

Impact of the book supply and professional development programme on children's literacy development and access to books

The impact of the project was examined in the sample of children from centres involved in the project and the control group. Standardised assessments were used before the Books Aloud programme and 8 months later to assess receptive language, concepts of print, environmental print

(the measure asked children to identify 10 signs in the children's environment), letter name knowledge, concepts of writing; and narrative competence. A sample of 35 treatment and 31 control group children were followed through into kindergarten and assessed again after a further 6 months. Other main measures were photographic accounts of areas in each centre where there were books; observations of child-teacher interactions; collection of daily schedules; and a teachers' survey.

Physical access to books was enhanced and the language environment became more supportive of literacy development, with teachers reporting they read aloud more often for longer in more subject areas than teachers in the control group. The Books Aloud teachers also regarded reading as an interactive rather than an isolated activity and children wanted to be read to more frequently.

Children in the programme scored significantly higher than the control group on four of six assessment measures (concepts of print, letter name knowledge, concepts of writing, and concepts of narrative). The most modest difference was in concepts of print, with Books Aloud children gaining about a 12 percent increase and control group children about a 4 percent increase. The most marked difference was in letter name knowledge, with Books Aloud children going from 38 percent to 64 percent, and control group children going from about 20 percent to 38 percent. Gains were still evident 6 months later. The childcare environments for some of these centres (buildings in great disrepair, guards to ensure children's safety) and the low training levels of staff fall well below standards of New Zealand centres. However, a key finding was that physical access to books and engagement of childcare staff in using books frequently, interactively, and developmentally appropriately, motivated young children to use and learn more about books and encouraged literacy development.

Professional development on reading story books with Tongan families

A small study (McNaughton, Wolfgramm, & Afeaki, 1996) showed how six of seven Tongan families in a Tongan early childhood centre added an additional "style" to their practices of reading story books, following a 30 minute educational programme. The group of Tongan families all read to their children at home, often using "Display exchanges" where the child was required to label parts of an illustration, letters or words in a text, or "Performance exchanges", where the adult would read and the child repeat. These exchanges reflected cultural practices and beliefs, and contributed to the children's expertise in family, church and early childhood centre activities. However "schools may not recognise the expertise that children bring with them to school (e.g. in recitation memory)" (McNaughton et al., 1996, p.5).

The researchers noted that parents are very interested in professional beliefs about early childhood literacy practices and that a third "Collaborative" style of reading story books using "Narrative exchanges", helps children enter school with conventional literacy and language skills. This style focuses on story meanings, often beginning with a question or comment and proceeding like a conversation. The researchers believed that parents had the right to access such professional knowledge, and discussed the idea of training parents in the style with local educators, parents and community leaders, who wanted to participate.

Parents were interviewed and provided the researchers with audio-tapes of book reading in their homes over one or two weeks before and after the educational programme. Aspects of emerging

literacy were assessed – Concepts about Print (translated into Tongan) and Letter Identification (modifed for the Tongan alphabet).

The programme shared ideas about types of reading, provided a video-taped demonstration and commentary, discussed and suggested practical ideas and used a group format. The programme focused parents on responding to child initiations by talking about the story, similar events and objects and other books. If the child did not initiate, parents were to initiate conversations.

After training, 6 of the 7 families used a collaborative style in reading story books and performance exchanges decreased. Children increased their active engagement in non-immediate talk. This talk "moves away from what can be seen on the page and include requests for thoughts on, and analyses of, the characters' behaviour and motivation, discussion of vocabulary, or connections between the story and the child's own worlds. The category includes "why" questions and predictions" (Dickinson, De Temple, Hirschler, & Smith, 1992, p.330). McNaughton et al. (1996) cited evidence that talking in this way is related to progress in literacy on entry to school. Mothers said that they used performance styles for church texts.

There were indications that where measures of letter identification and children's comprehension changed, these were towards increased knowledge and more comprehension scores answered correctly.

McNaughton et al. (1996, pp. 4-5) outlined three assumptions underpinning the approach:

- The ideas and beliefs held by participants in educational programmes are important determinants of the activities carried out by participants in relation to children's learning.
- Families have the right to access privileged educational knowledge.
- An educational programme that changed family patterns by introducing new ideas into socialisation practices could be justified if "textual dexterity" in reading texts resulted. Tongan parents were able to add to their styles rather than replace them.

The approach was an empowering co-constructivist approach. McNaughton et al.(1996) addressed some barriers: new story books in Tongan written by Tongan early childhood teachers/educators from Learning Media were supplied and some limited transport and telephone communication for families whose difficulties in transport and telephone communication meant they attended irregularly. They pointed out that educational programmes are dependent on adequate resourcing and the absence of book and telephone communication resources was a limiting factor for these families.

Action research on story telling with Tokelauan families

Sauvao (1995) focused action research with Samoan and Tokelauan parents in a Samoan and Tokelauan early childhood centre respectively on shared reading, story telling, and song teaching. She stated that a traditional belief of Samoan and Tokelauan parents is that only trained teachers should do the teaching, and gave evidence of the low level of involvement of parents in their children's educational activities. The action cycle included lesson demonstrations on shared reading, story telling, and song teaching, followed by parents undertaking the tasks and being observed, with the researcher giving feedback. Written and verbal evaluations indicated that fear

of other parents, of teachers, and of language incompetence hindered participation. Some examples were given of how parents became more confident in story telling and thought about how to interact with the children during the story telling.

Availability of books in Samoan licence-exempt centres

Burgess (1993) studied the number of books available in three Samoan licence exempt language groups and one kindergarten close to the language groups, and the types of literacy experiences provided for children in them. In each language group staff were "qualified", although the qualification was not specified. Burgess found less than one book per child in either English or Samoan in the language groups. There were 600 books in the kindergarten. Burgess did not state how many children were in the kindergarten, but if there were 90 (the largest number of children in any New Zealand kindergarten), the number would be almost 7 books per child. Only one book in the kindergarten was in Samoan.

Burgess (1993) found that only Samoan was used in reading or telling stories in the language groups. Children had access to the books all day. Enlarged books were used in only one language group. There was little interaction with children during story telling and no follow-up activities were observed.

Observations of the time spent on literacy activities in the language group showed the amount of time interacting with books was low for one, and about a quarter to a third of the time in the others.

Burgess noted that all language groups were doing traditional activities of learning the alphabet, numbers, and colours.

> *Although these activities are not recommended by some writers as appropriate practice for years three through to five, they are practices commonly observed at home and at Sunday School. As long as children are spending sufficient time with books, skill-focused activities can form a useful bridge into home literacy activities (Burgess, 1993, p.20).*

Oral literacy activities were a feature. All language groups had experiences of stories told by adults and stories told by children, two also had experiences of listening to tapes and stories told with puppets, and one had experiences of story tellers from the community.

Burgess emphasised the value for children in language groups of making literacy experiences a priority. She suggested two routes to achieve this:

- increasing the number of books and using these to stimulate language and play; and
- increasing the number of play activities that make use of literacy events.

This would require a wide range of books in English and Samoan, "stocking" play areas with literacy materials that children have observed in real life, and purchase or development of educational toys and games that are associated with reading and writing.

Burgess noted that "Language nests show all the signs of wanting to develop literacy in Pacific languages using many of the techniques that junior classes in primary schools would use" (Burgess, 1993, p.20). Given this interest, she also emphasised the need for quality professional development and parent education to support this, and liaison with primary schools. The Phillips, McNaughton, and MacDonald (2002) study reviewed above, may offer a pathway for these suggestions.

Language and social skills activities in a US professional development programme

Esler (2001) developed a programme of effective language and social skill activities and practices from her review of literature on effective childcare practices for building language and social skills in pre-schoolers. Three pre-school classrooms in the Midwest US were randomly assigned to a control group and three were randomly assigned to an intervention group. Children were aged 3, 4 and 5 years. Those in the intervention group were described as 50 percent White American, 31.3 percent African American, 10.4 percent Biracial, and 8.4 percent other. Those in the control group were 47.6 percent White American, 42.9 percent African American, 9.5 percent Biracial, and 0 percent other. The intervention, designed to enhance children's language and social skills, involved an intervention package of written material and three two hour in-service sessions covering language practices, social skills practices, book reading, and behaviour management. Each in-service course followed the same format: a rationale for the practices was given; developmentally appropriate expectations were described, materials in the intervention manual were presented with specific activities and strategies; an interactive component was held with videotaped or live demonstrations; practice or discussions and problem solving; and there was time for questions. There were two "booster" sessions six weeks later and time to talk to the researcher every Friday when she collected activity sheets. In total, the intervention occurred over a 4.5 month period. Comparison sites received the intervention package and one in-service training session to explain the intervention after data collection and analysis was completed.

Intervention language groups scored higher than comparison language groups on the Early Childhood Environmental Rating Scale (ECERS). Children in the intervention centres had higher language scores (using TELD-3, a norm referenced instrument designed to measure the early development of oral language) post-intervention than comparison group scores although there were similar pre-intervention scores. Children in the intervention group had language scores 14 standard score points (standard deviation 10) higher than the control group at the end of the intervention. Teachers' ratings of children's pro-social skills and problem behaviour supported the intervention being associated with development of social skills. However, there was a high rate of attrition (23 out of 46 children for the comparison group and 53 out of 75 for the intervention group dropped out, including one intervention centre which withdrew early in the study).

Unlike Phillips, McNaughton, and MacDonald (2002) and Ure and Raban (2001), there was no evidence of work to influence teachers' beliefs and understanding, and primary schools were not included.

Two New Zealand action-research case studies in playcentres have shown how enriching literacy materials and resources and providing professional development for adults aimed at stimulating literacy development can extend the knowledge and educational practices of adult educator participants.

Action research case studies in New Zealand playcentres

Interactive strategies during story reading

De Vocht (2001) surveyed parents in a rural playcentre to guide the direction of professional development for the two supervisors. All the parent respondents said they wanted to know more about how to extend children in their play and 79 percent thought that working with children other than their own was critical to ensure a quality learning environment. The researcher held two training sessions with the two playcentre supervisors in "adult interactive strategies during story readings":

- managing (introducing the story, providing background information);
- prompting (inviting questions and comment, scaffolding responses, relating child's responses to life experience); and
- supporting and informing (answering questions, reacting to comments, relating responses to real life experiences and providing positive reinforcement for the child's responses).

Children's (n=4) comments were counted during reading sessions with the supervisors before and after the training. There was a rise in mean number of statements made by the children in 1:1 book reading from 6.75 to 27. The supervisors said they had always related book reading to children's life experiences, but the training had helped them to be more aware of asking questions related to the meaning of the book, to leave more pauses, and to discuss the book before and after reading it. They thought children's feedback had increased, and children asked more questions and were more interested in book reading after the training. Examples from the supervisors' book reading with four playcentre children indicated that discussions of real life experiences and making links from the story to real life helped children make meaning. The examples suggested that children need adult support to understand the overall meaning of the books and to narrate the story. No evidence was sought on whether the other playcentre adults were influenced. In a playcentre setting where all adults are regularly involved in the session, it would seem that the next step would be to work with all the playcentre adults.

Writing opportunities for children

Moriarty (2001) used action research to investigate whether writing opportunities for children in a rural playcentre could be enhanced. The researcher was the playcentre supervisor. The 24 parents/caregivers of children enrolled had roles as teachers/educators and management for the playcentre and all participated in the action research. The researcher drew on her own observations of centre practices, her knowledge of writing, and her experience as a primary teacher to identify that more could be done in the playcentre to set up opportunities for writing and to encourage children to explore writing. Her views were presented to playcentre members who agreed to take part in research.

Action research involved:

- surveying parents/caregivers on their knowledge of writing, their views of what the playcentre did to encourage writing, and their interest in finding out more;
- discussion at a playcentre meeting of the survey findings and of suggested means to enhance writing. The meeting reached consensus on actions to be undertaken to provide an

environment conducive to writing, writing opportunities, and encouragement for children's writing activities as well as opportunities for parents to gain more knowledge/awareness of the purpose of writing and children's writing development;

- a writing workshop for adults, and putting into place actions as agreed; and
- an evaluation meeting, a review survey, and observations of emergent writing. These showed that over 3 months opportunities for children to experience emergent writing were improved, adults became better informed about how writing develops and what they could do to enhance writing skills, equipment was accessed and stored appropriately, and adults reported more confidence in providing a stimulating writing environment for children.

Important features were the construction and adoption of the action plan by the whole playcentre community, the focus on a specific aspect of literacy, the action research cycle of plan, act, and observe, reflect, and the knowledge of the researcher and her acceptance within the group. Action research was a good method in supporting change within the co-operative playcentre setting. The research did not directly show outcomes for children.

Professional development and mathematical and scientific learning

Why mathematics matters in early childhood education

The Competent Children study (Wylie et al., 2001) found evidence of different long term patterns of performance in mathematics for children who started school with different levels of skill. They found that children who performed highly for mathematics and early literacy at age five continued to score well at age ten. The authors used this evidence to emphasise the importance of early childhood and primary teachers gauging what knowledge individual children have; and supporting young children's mathematics and literacy development in both early childhood settings and in the first years of school. They suggested provision of literacy and numeracy resources and professional development, as well as work to help parents have confidence, knowledge, and skills to use mathematics in everyday life with their children.

Young-Loveridge (1991) has also shown that numeracy skills and concepts are quite consistent and stable from school entry level to age 9. Strong predictors of later competence in mathematics were a "forming sets" task, numeral recognition, pattern recognition for small numbers, rote counting, sequence forwards, and enumeration.

Young-Loveridge, Carr and Peters (1995) found a high degree of variability in numeracy skills and concepts among children attending four Waikato kindergartens and relatively few mathematics learning opportunities occurring. Very little mathematics was being used in the kindergarten even by children who were identified as being expert mathematicians. They also found evidence that teachers may not be aware of differences in mathematical competence that appear during the early years.

Hawthorne (1998) reviewed international evidence showing that children are inventive mathematical thinkers before they come to school and highlighted the importance of constructing mathematical learning environments which allow children to develop their own mathematical knowledge. She noted evidence supporting a view that the role of the teacher is to "structure

appropriate learning environments, observe critically and intervene in ways which challenge children's thinking" (Hawthorne, 1998, p.44).

An issue identified by Hawthorne's review is that early childhood teachers/educators may not have specific knowledge about how children learn mathematics, and some assume that children will learn simply by concrete activities with materials. She argues that planning and programming and pedagogical understanding to provide integrated relevant learning experiences is needed.

Pedagogical approaches

The Tasmanian Early Childhood Review (MacNaughton, 1999, pp. 7-8) summarised current research and thinking about numeracy and mathematics for young children as follows.

> *There is changing understanding about what skills are foundational to mathematical learning and how these might best be promoted in young children. For instance the generic skill of problem solving is one now seen as a key skill in mathematical learning for young children (Wright, 1994) but what this looks like at different ages needs to be described and tracked.*
>
> *There is a need to think carefully about how to talk about and track mathematical thinking in young children. Cobb cautions that it is "not whether students are constructing, but the nature or the quality of those socially and culturally situated constructions … the learning of mathematics as science must be viewed at least in part as a process of enculturation into the practices of intellectual communities" (Cobb, 1994, p.4).*
>
> *There is strong support for activity-based, problem-solving approaches to mathematical learning with increasing formalisation of methods as children's capabilities grow (Hall, 1996; Young-Loveridge et al., 1995) and for children learning about mathematics through being active researchers of the world with more competent others (Groves & Stacey, 1990; Watson, 1997).*

Whitin (1997) suggested that early childhood teachers/educators should provide opportunities for young children to gather, organise, display, and interpret their own data so that they become critical consumers of numerical data and facts. He gave examples of ways in which young children are capable of refining data, exploring concepts such as scale, representing data, and showing what the data reveals and does not reveal. He suggested strategies on how this might be encouraged, but did not report on any research evidence about those strategies.

Peters (2001) argued for an approach to numeracy that is based on both skills and dispositions as mutually inclusive goals of education. Such an approach would avoid the risk of a narrow teacher centred instructional focus that evidence has shown is counterproductive to enhancing children's thinking, e.g., Smiley and Dweck's (1994) evidence showed that children with "performance goals" curtail their opportunities when they are uncertain of a good outcome and may avoid new learning experiences, while those with "learning goals" may tend to choose challenging learning situations. With this precaution, Peters argues that a "laissez faire" approach to numeracy does not work because teacher planning and involvement is required.

A key question is how children's mathematical competencies can be supported and extended in early childhood education, and the role of professional development in enhancing teachers' understanding and skills. Haynes (1999) believes that infants and toddlers are particularly reliant on adult support for learning, and described mathematical development for them as requiring "informed adults who have the knowledge and confidence to plan for, participate with, the infants and toddlers as they make sense of their mathematical world" (p.142). Such a statement relates to evidence reviewed on p.43 that adults need to have pedagogical content knowledge to enable them to respond and take action.

Carr, Peters, and Young-Loveridge (1994) suggested a framework for looking at how children learn the mathematics of their culture, based on a sequence of levels developed by Herbert Ginsburg. This framework has been described recently in Peters and Jenks (2000) and Peters (2001).

The framework comprises three levels:

- *Informal and natural level of mathematical thinking.* Here mathematics is universal where very young children rely on intuitive concepts and techniques for solving mathematical problems. They are aware of numbers and quantities but do not yet use the number system and other mathematical tools of their culture. Surrounding infants with a rich mathematical environment will facilitate their awareness of the mathematics of their culture.
- *Informal and cultural level of mathematical thinking.* Here children start to use the mathematics of their culture informally and the tools they use will be dependent on the culture and influenced by the attitudes and behaviours of the people the child spends time with. Skills to develop are learning to count and representing number. Peters and Jenks (2000) describe evidence for influential factors. These are children's dispositions to learning and the corresponding behaviours (Carr, 1998b), the child's purpose for using mathematics (Young-Loveridge et al., 1995) and the categories of difficulty that the children may encounter in their mathematical learning (Carr et al., 1994).
- *Formal and cultural level of mathematical thinking*. Children begin the formal study of the mathematics of their culture, usually at school. Peters (2001) cites evidence that formal teaching of number to young children may be counterproductive and highlights the importance of making links between the informal and cultural thinking and the more abstract formal and cultural thinking.

Peters (2001, p.13) described a three dimensional approach within this framework looking at contexts, purpose, and skills, which could be a guide for teachers and caregivers:

> *By actively encouraging and promoting mathematical thinking and problem-solving through interactions with adults and the introduction of relevant materials in different areas of play (family corner, outside, etc), the range of contexts can be extended. The nature of these interactions and materials can be used to extend the purposes for which mathematics is used. As children's skills develop, the level of challenge can be increased to promote more complex mathematical thinking, thus furthering the child's level of skill.*

Science and technology

In relation to current research and thinking on science and technology, MacNaughton (1999) stated:

> *There is a debate in the early childhood literature about how science and technology should be taught to young children. However, there is growing support for constructivist approaches to science which encourage children to investigate the world with competent others and help children learn how to think about their investigations scientifically (e.g. Fleer, 1992).*
>
> *Fleer (1993) and Fleer, Corra and Newman (Fleer, Corra, & Newman, 1996) have developed strong arguments for how technology may be understood and practised in the early childhood curriculum.*
>
> *Marxen offers strong support for an integrated approach to teaching science writing that:*
>
> *"As children investigate and explore a physics activity, they will also be developing skills in language, arts, mathematics, social studies, science and the fine arts" (1995, p.214).*
>
> *Computers should be used in developmentally appropriate ways and in general are not recommended for children under three as they do not match their learning styles (Haugland, 1999).*

Children's scientific, technological, and mathematical understandings are influenced by cultural views. Fleer (1996a) described the need for early childhood teachers to actively seek out the cultural views which influence children's scientific thinking. She noted "a vast body of literature which supports the view that children's scientific understandings will significantly influence how they interpret and act upon science experiences presented to them in centres or classrooms" (Fleer, 1996a, p.12). She argued that teachers need to try to find out what children think of a particular scientific concept before planning their learning. Knowledge is culturally situated, interpreted, and understood, and it is important that teachers do not assume a deficit model of understanding in science or a Western science perspective.

Carr (1994) argued that traditional approaches to incorporating science education in early childhood education had tended to deal with scientific content knowledge and children's understanding of the physical material or natural world. They had not explored the processes of puzzlement. She argued that "children in early childhood are developing scientific thinking processes outside these science domains, and that this should be seen as part of a science program in early childhood education" (Carr, 1994, p.28). She gave evidence that personal and social domains are of great interest to children, and that strategies of scientific thinking (e.g., asking questions, representing, making analogies, thinking about language and learning, imagining, and deductive reasoning) can be encouraged in these domains. Transfer to science domains can be encouraged.

Evidence of impact of professional development on children's mathematical and scientific concepts and problem solving

Professional development and mathematical concepts and problem solving: New Zealand evidence

There is little evidence on the impact of professional development on development of children's mathematical ideas. The only New Zealand study, the EMI-4s (Young-Loveridge et al., 1995), provided evidence of the impact of interventions with kindergarten teachers.

The purpose of the EMI-4s study was to find out how mathematical concepts and skills are enhanced at the four year old level. The researchers began by interviewing 154 four year olds in four Waikato kindergartens, then observing four expert mathematicians and four novice mathematicians in each kindergarten. They found evidence of a high degree of variability in mathematical concepts and skills and a low incidence of mathematics occurring within the kindergarten contexts.

The kindergarten teachers were all enrolled in an Advanced Qualifications course where they extended their knowledge of research on young children's mathematics development. This meant they met weekly and were able to discuss their ideas. The researchers discussed mathematical ideas and provided written resources to teachers in three of the kindergartens. Teachers were responsible for developing activities during the intervention period, constructing resources and working with children to enhance their mathematical thinking. Those in the fourth kindergarten continued with their existing programme. The approach taken in each of the three kindergartens differed, but all included a greater focus on the mathematics involved in everyday routines and activities, exploring the mathematical opportunities in the areas and activities a child was already engaged in, and utilising songs, games, number books etc.

Following observations and parent interviews, children's interests were identified and incorporated into the resources and activities that teachers developed. Analysis of the children's mathematical skills before and after the intervention period showed a significant gain for the children attending two of the participating kindergartens compared with those who attended the contrast kindergarten.

> *The findings provide evidence that through this professional development intervention, teachers were able to enhance the mathematics of children in their kindergartens. What seemed to be important in the present study was the increased awareness that teachers gained which enabled them to pick up on a mathematical idea, building on existing activities and talk, rather than planning a structured mathematics programme. In the [third] kindergarten where the intervention was less effective, teachers thought of mathematics as being a planned activity rather than a way of thinking and talking that could be part of the ongoing programme (Young-Loveridge et al., 1995, p.142).*

In this study, children identified as "expert" mathematicians spent more time with adults than did children identified as "novices". This is further evidence of the role for the adult who is the "expert" in the culture's number system and its uses to actively plan for, pick up on, and extend mathematical ideas. Through engaging in activities and conversations with individual children, the teachers were able to develop an awareness of each child's current level of skill and therefore to offer activities which provided a suitable level of challenge. However, it was difficult for teachers in these kindergartens to spend time in complex or extended interactions with children

because of the poor teacher/child ratio (1:13.3). These compare with ratios of 1:6 in Sweden (OECD, 2001).

Scientific concepts and problem solving: Australian evidence

Pedagogical content knowledge was emphasised in a project in Queensland, Australia, on science education (Watters et al., 2001). Watters et al. noted that issues and concerns about science education have been highlighted in the *Australian Journal of Early Childhood* during the 1990s. They supported Fensham's (1991) view that three concerns need to be addressed: greater recognition of the importance of science education; early childhood teachers need better preparation and background knowledge in science; and early childhood teachers/educators as a whole need to recognise the role of science education in young children's development. Young children have an interest and enthusiasm for science which needs to be capitalised on. Watters et al. cited evidence (Coulson, 1992; Goodrum, Cousins, & Kinnear, 1992; Watters & Ginns, 1995) that many early childhood teachers have limited confidence with science and the ability to teach it.

They described a professional development programme and resource kits offered to 700 early childhood teachers in Queensland from 1994 to 1996. The conceptual frame for the project was that learning science requires children to apply their own ideas and create knowledge, rather than have predetermined information "taught" to them. Social interactions and scaffolding by the teacher play key roles. Given the lack of confidence of teachers towards the subject and their ability to teach it, there needs to be integration of learning of science and of effective pedagogy in the professional development of early childhood teachers.

The professional development programme included an "orientation phase" where the background to the project, curriculum policy, and initiatives related to science were discussed. Ideas underpinning constructivism were discussed so that participants were introduced to contemporary ideas informing science education. A resource kit video providing an example of an early childhood teacher teaching within a constructivist framework was shown and discussed, and the equipment kit and manual were displayed.

In the second "engagement phase", participants explored, discussed, and experienced the suggested strategies in relation to science topics (e.g., electricity, matter, sound). Each group worked on a topic for about 45 minutes. Participants were encouraged to develop explanations and articulate new ideas and revisit their initial concepts. They explored resources related to the topic and suggested ways of using these to extend children's thinking. The final "reflection phase" involved reporting back and debriefing. The process was repeated with another topic so that the process of working scientifically would be reinforced and participants' experience with conceptual areas would be broadened.

In the final "reflection phase" strategies were reviewed in relation to the socio-cultural framework. Participants reflected on their experiences and identified concerns about teaching science.

Feedback from a brief final survey completed by 192 participants indicated:

- Participants adopted a child centred approach in their beliefs about teaching science. This related to teachers' knowledge about pedagogic principles.
- Participants' personal understanding of science was enhanced. This was seen as important because it increased participants' confidence in teaching science. Participants' beliefs about the value of science education were aligned with pedagogic understanding, e.g., as a way of encouraging open-ended questioning and investigation.
- Participants developed their understanding of learning in science and how to draw on children's prior knowledge.
- Participants acquired knowledge of classroom strategies to teach science (e.g., how to encourage children to identify problems and raise questions, recognition of importance of strategies such as collaborative learning and active engagement, recognition of a different approach to teaching science).
- Participants valued investigative activities as the basis for inquiry for themselves. The direct experience gave participants knowledge and confidence to provide similar opportunities for children.
- Participants overcame the limitations of resourcing, by developing strategies for organising and managing these materials.

Feedback during the professional development cycle, when concerns associated with science teaching were elicited, showed four themes about teaching science.

There was a need for information, in particular background information on topics, on the recently introduced Queensland science curriculum, and on the relationship between the science syllabus and the resource kit. Secondly, information on planning, implementing and assessing lessons was sought. Thirdly, contextual information was sought, e.g., how to teach science in multi-age settings. Fourthly, teachers reported a need for activities and investigations that integrate science with other curriculum areas and are appropriate for the early childhood age groups.

The need for resources and professional development support, through workshops, networks to share ideas, and specialist assistance were two other themes.

Fleer (1996b) described a study investigating the impact of a science teaching and learning programme undertaken by teachers on ten families of children attending an Australian childcare centre. Children were aged 2 years 8 months to 4 years 10 months. Ethnicity of the children was not described. The teaching and learning programme featured five units with a scientific focus on: solids, liquids, and gases; materials and their properties; evaporation and condensation; dissolving; and decay, rusting and burning. The programme was based on constructivist principles, using an interactive approach (finding out children's understandings, children asking questions and investigating their questions). Teachers encouraged shared understanding with parents through a newsletter to parents, activity booklet with home based follow up activities, and direct sharing by teachers with parents.

Parents were interviewed before and after the programme about:

- parent perceptions of science and scientific learning;
- family experiences – stories told by the parents that related to the teaching programme; and

- parental perception of the teaching programme and the effect on the child.

The implementation of the teaching and learning programme was videotaped to record children's and teachers' comments. Comparisons between initial and follow-up parent interviews showed that children asked more scientific questions at home than prior to the study, although they did not ask scientific questions at the centre. Examples were given of one parent reporting a greater depth of questioning, and another that their child wanted to do some investigating. All parents commented on the predominance of scientific based discussions that were occurring in the home. In addition, "Parents reported that all forms of communication were useful for knowing not just what was occurring in the teaching and learning programme, but how they could extend or reinforce learning for their child" (p.149). There was a change in parent perceptions of science from an "elitist" view (a laboratory context with elaborate equipment) to an everyday perspective. This change in perspective also helped parents change their view of their own role, and to see they could play an active role in the development of children's scientific thinking. In most of the post-interviews, parents were more specific about what their child understood, what terms the child used, and whether or not the child understood the concept.

Fleer (1996b) suggested the need for a close examination of teaching context, since children did not ask scientific questions in the childcare centre, but did ask scientific questions in the home.

Summary

There is very strong evidence of ways in which professional development can enable teachers/educators to enhance children's early literacy, and, to a lesser degree because fewer studies have been done, mathematical and scientific learning. Although the content of the professional development programmes associated with enhancement was different, there were common features in approaches. In all professional development programmes, adults' own knowledge and thinking was explored and extended. Professional development encouraged an approach that was in keeping with knowledge of effective pedagogy, both generic and for the particular area, with teachers engaging children in meaningful activities and encouraging them to be involved and investigative.

Teachers/educators who resisted deficit models of children's experiences and skills and who worked towards establishing greater congruence between home and early childhood centre, and home and school were better able to provide environments that supported and promoted early literacy, and mathematical and scientific thinking. These findings support Bronfenbrenner's (1979) ecological model of human development and the importance of strengthening linkages between settings. This was particularly crucial in the education of children from low socio-economic groups, and cultures that were different from the teacher's own culture. Professional development could assist teachers to work from an empowering model by helping change teachers' beliefs and expectations about what children can achieve, and enhancing teachers' skills and understanding.

Assumptions were challenged when teachers had opportunity and external support to gather data from within their own setting. Programme development supported this process by offering tools for data collation and analysis, and another perspective on the data. Teachers became aware of assumptions, when the data offered new insights.

There was evidence that a universal approach – encouraging all children, rather than focusing on children perceived to have "problems", seemed to work best in providing environments that supported literacy and mathematical thinking.

Burgess (1999) contended that traditional "performance" activities by Pasifika teachers/educators of learning the alphabet, numbers, and colours, could form a link with home and church based activities. McNaughton, Wolfgramm, and Afeaki (1996) argued that the expertise children learn in "performance" activities may not be recognised in school settings and that parents are entitled to know about styles of reading associated with school-related forms of literacy. They demonstrated how an educational programme with Tongan parents could add to their "performance style" by offering them a new style, based on constructions of narrative meaning. This new style was used in addition to the "performance style". Its use was associated with reductions in the "performance style" in reading story books and increases by children in non-immediate talk.

There was evidence that many New Zealand early childhood centres could do more to promote literacy, mathematics, and science activities and interactions for all children who attend them. There was evidence that Pasifika playgroups and licensed early childhood centres may have few literacy resources, partly because of the paucity, for example, of written resources in the language of the centre.

The philosophy of Pasifika early childhood education centres is for learning to be embedded within the Pasifika Nation's language and culture, while operating within a New Zealand context. Pasifika centres therefore have particular challenges to work in two worlds: their own cultural world and the non-Pasifika world of New Zealand's early childhood regulations and requirements. Mitchell and Mara's (2001) evaluation of Early Childhood Development's licensing and chartering advice and support, and advice and support to licence exempt playgroups, found management committees of Pasifika centres may find it hard to understand and comply with licensing and chartering responsibilities and requirements. Advice and support of ECD co-ordinators was found to be variable. Where licensing and chartering responsibilities were not fully understood, centres were sometimes not viable. There were also a high number of non-compliances following ERO reviews.

Another issue for Pasifika centres is that there is only a small pool of qualified Pasifika teachers in New Zealand, making it hard for them to recruit qualified teachers who are also fluent in their Pasifika language.

For licence exempt centres the evaluation showed a strong desire by parents to be supported in maintaining Pasifika languages and cultural values, and a need expressed by a Pukapukan group for a co-ordinator who spoke their language.

This indicates the importance of management support, as well as access to appropriate professional development that supports Pasifika centres to provide effective pedagogy within their own language and culture.

BUILDING LINKAGES BETWEEN CONTEXTS

In this section, we review evidence on professional development and working with diverse children, families, and communities, and ways in which professional development enables teachers/educators to draw on individual and cultural perspectives so that linkages are strengthened between settings. Bronfenbrenner's (1979) ecological model of human development described on page 7 provides a theoretical rationale in support of co-ordinated systems and closely matching settings. Co-ordination and matching can be harder for early childhood teachers/educators to achieve when the children and families in their early childhood services are from different cultures from the teachers/educators or have different experiences from their own. The model developed by Royal Tangaere 1997) showed the complexity for Mäori children who need to operate within the Mäori world and the non-Mäori world.

In this section we provide:

- evidence about social and cultural contexts and effective professional development approaches in settings for Mäori children and Pasifika children;
- evidence about professional development and building linkages between home and early childhood setting, and between home and school; and
- a summary to draw together evidence reviewed elsewhere in this report to show common threads in professional development approaches which led teachers/educators to challenge inequities and/or their own deficit assumptions.

Social and cultural contexts for Mäori children

Mason Durie (2001) described three pathways for Mäori education – Mäori centred pathways largely under Mäori direction, Mäori added pathways, where a Mäori dimension is added to an existing framework, and collaborative pathways. While different pathways will give greater emphasis to particular goals, he stated that all pathways should work towards similar broad goals. These are enabling Mäori:

- To live as Mäori – to have access to te ao Mäori.
- To actively participate as citizens of the world. "There is a wide Mäori understanding that education should open doors to technology, to the economy, to the arts and sciences, to understanding others, and to making a contribution to the greater good" (Durie, 2001, p.4).
- To enjoy good health and a high standard of living.

He contended that sound principles must guide education. The principle of "best outcomes" and zero tolerance of failure should guide action in the next 25 years.

> *Achieving best outcomes means focussing more on the product and perhaps less on the packaging; it also means making sure that the measures of progress actually quantify an outcome and not simply compliance with a programme, or a demonstration of rote learning (Durie, 2001, p.6).*

The principle of integrated action is a second key principle for education. This recognises that there are multiple players in education, and calls for integrated action between educational institution and community, teachers and parents, students and their peers, and Mäori and the State. It recognises the power of acting together in these spheres to encourage comprehensive development and steady progress.

The third key principle for education is the principle of indigeneity – "a set of rights that indigenous people might reasonably expect to exercise in modern times" (Durie, 2001, p.8).

While education is not expected to be solely responsible for achieving these goals, he argued there is a big responsibility for education to make a major contribution to them.

A Mäori centred pathway

Te köhanga reo is a Mäori centred pathway which focuses on access to te ao Mäori, the Mäori world, and is aligned with the goals of Mäori language revitalisation and Mäori development. Hohepa, Smith, Smith, and McNaughton (1992) argued that understanding the effectiveness of te köhanga reo for language development and classroom discourse requires a theoretical framework which enables language acquisition to be culturally contextualised. They provided data on Mäori language competencies of children aged 5 to 7 years in a kura kaupapa Mäori who were graduates of a köhanga reo to show their expertise in Mäori language in comparison with a group studied by Clay in 1968, who did not have the benefit of köhanga reo.

> *The argument is that acquiring linguistic knowledge and acquiring socio-cultural knowledge are interdependent. Language development is partly organised by social and cultural processes. Embedded in such an approach is the notion of language socialisation processes, by which young children are socialised to use language and socialised through the use of language. Nevertheless, language users are seen as active rather than passive participants in this process (Hohepa et al., 1992, p.334).*

Therefore a sense of the social and cultural context is needed to understand the effectiveness of te köhanga reo. Hohepa et al. (1992) collected observational data on three children in a köhanga reo over five weeks, including oral and written recordings of each child's expressive language experiences and non-verbal behaviour. They found that cultural contexts, beliefs, and activities provided settings for language mechanisms. In turn, the language mechanisms passed on culturally valued ways of thinking and acting, for example, the concept of Whanaungatanga[2] provided the context for "Ko wai au" (Who am I?) routine used to help children become aware of their whänau, hapu, and iwi links. Hohepa et al. argue that judgment or comment about the effectiveness of language socialisation practices needs to be localised.

[2] Whanaungatanga draws on the importance of whakapapa or genealogical ties and the in-built collective responsibility that this cultural pedagogy expects. Within the concept of whanaungatanga is an expectation that whänau will support, guide and care for the mokopuna as well as the parents.

We had no access to evidence about the impact of professional development for kaiako, whänau and mokopuna in köhanga reo, although the Te Köhanga Reo National Trust advised us that it has gathered data which is to be analysed when the Trust has resources to do this.

The collaborative work being done currently by NZCER and Te Köhanga Reo National Trust to evaluate Early Childhood Education Equity Funding is using measures of quality that are appropriate and specific to Mäori, including some relating to the concept of whänaungatanga, and cultural interaction. Measures of participation include customary quantitative measures and measures relating to early childhood education services' staff and parents' experiences of parental engagement, co-ordination, and cohesion between early childhood service and home, and early childhood service and school. These could form useful measures for any future study of professional development in relation to children's learning to participate in te ao Mäori in köhanga reo, Mäori immersion services, and general services.

Equitable treatment of Mäori children within early childhood services

Many Mäori children participate in general early childhood education services and these may have a Mäori dimension. Within general services, depending on the staffing composition, perspectives, and awareness, inequalities for Mäori students may be reinforced.

Cazden (1990) used the term "differential treatment" to describe the fact that opportunities for participation and responses to that participation are not distributed equally or randomly. The quantity and quality of participation is linked to gender, ethnicity, and/or social class. Differential treatment in teacher-child interactions is one site of inequalities that may reinforce inequalities of knowledge and skill. Although Cazden's study was in a school setting, her findings are discussed here because of their importance and their applicability to any education setting, including early childhood settings.

Cazden described Clay's (1985) and Kerin's (1987) research in new entrant classes showing patterns in invitations to students to "talk more" (provide verbal elaboration). There was an overall decrease in "talk more" requests over the year and there were differences in interactional styles. There were differences in classrooms with some students receiving more invitations to "talk more" than others. The largest ethnic differences were in Päkehä teachers being more apt to ask Päkehä and recent immigrant students to "talk more" than their Mäori students. These differences were regarded as a concern because of evidence of the importance of teacher-child conversation for children's language development, and of children's talk about events and ideas for their understanding of the world, for teachers' understanding of children's ideas, and for an accurate assessment of the child's knowledge.

In 1987 Cazden and Selkirk (Cazden, 1990) undertook an in-service intervention that focused on classroom situations to see if teachers' attention could be shifted to characteristics of the settings for interaction, rather than the students. They presented teachers with the Clay (1985) and Kerin (1987) research, providing positive and negative examples of "talk more", exploring reasons for the patterns and encouraging teachers to tape and analyse their own interactions for ways in which they did or did not encourage children to express ideas about a topic. They also suggested that aspects of the classroom and school environment might be important influences:

- Small group work could lend itself more to teachers asking metacognitive questions than does individual work.
- Small group work may take account of "interactional preferences" of Mäori. This view that there are different "interactional preferences", however, is situated within a deficit model of what works for whole groups, which has now been substantively challenged. Hohepa, McNaughton and Jenkins (Hohepa, McNaughton, & Jenkins, 1996) analysed participation structures and language socialisation in a köhanga reo, showing that while group settings were favoured in the activities observed, they "provided a context in which dyadic interactions and personalised conversations occurred" (Hohepa et al., 1996, p.38). There were many opportunities for children for rich dyadic interactions. They went beyond exchanging information, questioning and answering, directing and informing, and included in many cases, time spent in negotiating meaning. The researchers concluded that homogeneous descriptions of culture and pedagogical preferences are inadequate and that both individual and group learning needs within cultural frameworks are significant. Further evidence has been reviewed by Alton-Lee (2003);
- a longer wait time might make it more likely for Mäori children (and other children) to say more;
- some curriculum topics posed problems for Päkehä teachers; and
- the composition of staff could create inequality. An ethnically diverse staff could model equal status relationships.

> *By the end of this in-service work, there was no evidence whether these suggestions made any difference. We could only hope that the suggestions might be picked up, developed, and tested by other New Zealand teachers and researchers (Cazden, 1990, p.299).*

Cazden's argument is for more work developing approaches to professional development that will change a long-standing pattern of differential treatment of Mäori students in New Zealand.

Evidence about collaborative international work with indigenous people

A relevant strand of evidence is about work with indigenous people in other countries. Ball and Pence (School of Child and Youth Care, University of Victoria) (2001) provided us with a kit describing the First Nations Partnership Programme in Victoria, Canada. Seven First Nations community groups worked in partnership with the University of Victoria to strengthen capacity and achieve developmental goals for children. This was initial training rather than a professional development programme, but the approach could fit a professional development model.

In all courses, locally recruited instructors, elders, and other community resource people met weekly with students to discuss and model traditional customs, language, and values related to children's stages of development. Theoretical and curriculum approaches in mainstream early childhood settings were examined at the same time. All seven partnerships consciously focused on strengths rather than deficits.

A two year evaluation programme involved:

- questions from the partner communities that would yield feedback of interest to their agenda;
- data collected by "collaborators" from the communities;
- commentary from community members who had been involved or affected by the programme; and
- examination of the impacts of the training programme across groups of programme participants (through interviews, questionnaires, focus groups, observations, community forums, review of records).

> *The evaluation showed that the 'Generative Curriculum Model' successfully responded to the First Nations partners' search for a culturally specific alternative to prevailing 'pan indigenous' training programs and cultural 'add-ons' to mainstream curricula. Elders' involvement in co-constructing the training curriculum resulted in a good 'fit' between the attitudes and skills reinforced through the training program and the specific goals, needs, and circumstances of the children and families in their particular community (Ball, Undated, p.1).*

This approach was reported to strengthen the wellbeing of families through quality childcare, and to bring new jobs into the community, offer an education career ladder and forge new intergenerational partnerships (Ball, Leo, & Pierre, 2001) .

Three formative evaluations have been carried out, showing a higher rate of post-secondary qualifications and career development among the teaching trainees than have been reported for most post-secondary initiatives. "More importantly there is accumulating evidence of many kinds of personal, interpersonal and community transformation" (Ball & Pence, 2001, p.31).

Ball & Pence (2001) attribute five elements to the success of the community based training:

- the whole community participates;
- programme participants rediscover their cultural heritage;
- students live and study in the community and familiar surroundings;
- students become role models in the community; and
- the programme benefits the wider community.

The approach fits with the argument that the definition of "quality" must be arrived at through an inclusionary process (Dahlberg et al., 1999; Pence & Moss, 1994).

> *Being responsive to communities and being sensitive to culture means more than letting community members voice their concerns or preferences; more than acknowledging diversity. It means opening up the very foundations of how training programmes are conceived, and how optimal development outcomes are defined, to let communities co-construct programmes of training and*

services that will further their own internally identified goals (Pence & Ball, 1999, p.45).

Collaborative work with New Zealand families with non English speaking backgrounds

We found one example of an action research approach assisting teachers to work more closely with Non English Speaking Backgrounds (NESB) children and their families.

This case study in Berhampore Kindergarten (Early Childhood Development, 2001) described an approach to professional development involving:

- Data collection and fact finding.
- A needs analysis undertaken jointly by the professional development co-ordinator and kindergarten staff in relation to developing the kindergarten programme to meet the needs of their culturally diverse group of children.
- Development of an action plan.
- Reflective evaluation of the action plan and discussion of readings.
- Development of a new action plan 2.
- Reflective evaluation 2.
- Development of a new action plan 3.

While this case study did not gather evidence of the impact for children's outcomes, it noted staff evaluations of changed practice for children's learning opportunities. For example, staff developed vocabulary lists of Somali, Assyrian, and other languages and there was more use by staff of these. The professional development co-ordinator observed that at big group times, NESB children were less able to participate, and the size of the group was overwhelming to some. Staff divided the big group into three groups and this enabled them to work with more NESB children on e.g., scaffolding language acquisition. Documentation from the kindergarten showed a Samoan mother teaching songs and reading to a small group in Samoan. In another small group a child was translating for a new non-English speaking Somali girl who was observed to be relaxed and engaged. The co-ordinator also observed parents participating and contributing to the small group sessions. Children who were grouped ethnically could provide peer language support.

Collaborative work with families

Professional development that aims to open teachers/educators' minds to the perspectives of families, children, and communities may enable teachers to develop community and culturally appropriate practice. Margy Whalley and the Pen Green team (Walker & Ritchie, 1995; Whalley, 1997b; Whalley & the Pen Green Centre Team, 2001) described an approach to involving parents in children's learning which also demonstrates the effectiveness of working in partnership, in this instance with parents. The way of working was intended to bridge the "conceptual gulf" that exists between people who lack shared experience.

This centre is a UK "centre of excellence". It works from a value base of power sharing with parents and from a belief in parents' commitment to their own children. The Pen Green approach

requires teachers to challenge their own practice so that the service is accessible to all parents. A research and development process and training for both parents and staff is an ongoing feature of Pen Green work. The "Pen Green Loop" (Whalley & the Pen Green Centre Team, 2001, pp.139-148.) is a process of participation by parents and teachers/educators aimed at giving and evaluating feedback about children's learning and things that are important to the child at home and in the early childhood setting. The loop follows an identifiable sequence of parent led observations and feedback to staff and staff led observations and feedback to parents.

Parent-led observations and feedback to staff

- Most parents attend at least two training sessions on child development concepts that inform Pen Green practice. They are offered an opportunity to learn how to use a camcorder and take videos of their child playing and learning "at a deep level". Parents make observations of their child at home.
- Parents share observations with their nursery worker, or in study groups.
- Observations are fed to other family workers at a weekly curriculum planning meeting.
- Individual planning occurs to meet the needs of the child in a "cognitively challenging and emotionally supportive environment".

Staff-led observations and feedback to parents

- Nursery workers observe "target children" in the nursery and share observations in curriculum planning sessions. All children are targeted over a four to six week period.
- Information is fed to parents at weekly research meetings or at beginning and end of sessions or through exchange of books and video.
- Parents make informed decisions about provision and experiences at home.

Aims for staff were that they become "educator researchers" able to debate issues among themselves and with parents. Initial training for staff included video techniques, staff issues around being video recorded, ethical frameworks for interviewing, interview techniques, style of engaging parents, and producing portfolios of children's learning. Over the five years of the project, training has adapted to identified needs, e.g., in 1998, in-service training focused on science and mathematics in the nursery, and baby and toddler study groups were held.

All staff have responsibility for reading and reviewing parents' diary entries and video recordings, and matching these against staff observations. A forum for discussion is provided by the weekly meetings. All staff have release time for extended home visiting, to interview parents, and to develop portfolios of children's learning.

> *With both sets of information, curriculum planning in the nursery became much more focused and we were able to respond quickly to individual children (Whalley & the Pen Green Centre Team, 2001, p.21).*

This example illustrates the role of a system of ongoing professional support for staff including tools and time to document and think about learning, a collective forum for discussion, and

workshops on relevant areas. It showed how an action research spiral can be used effectively with parents to further goals for children as an ongoing way of working.

Another Pen Green project done in collaboration with another early childhood education beacon of effective practice, Reggio-Emilia, Italy, was described by the European Commission Network on Childcare (1995). Both Pen Green and Reggio Emilia early childhood education services had an interest in trying to involve fathers more in the upbringing of their children, and in the early childhood service.

In 1990, the Reggio-Emilia regional government made it a political objective to support increased participation by fathers in the care of their children and in services for young children. Early childhood services were seen as potential centres for promoting cultural change. Research was undertaken by the two local universities to study fatherhood and motherhood in the region, and to consider the possibility of working with Pen Green. The Pen Green interest had arisen from Pen Green's commitment to empowering parents and children. Pen Green had been successful in involving mothers, but with a few exceptions, not fathers.

The project reported here was an early childhood education project between early childhood education centres in Reggio-Emilia and Pen Green aiming to support increased participation by fathers in early childhood centres and to contribute to discussion of the broader role that early childhood education services might play in enabling greater gender equity in sharing family responsibilities.

In Emilia-Romagna, the project began with the development of a training scheme to explore social and family changes, fatherhood and motherhood, legislation, and appropriate group work techniques. In the first pilot scheme involving groups of mothers and fathers from six towns, 100 parents were involved. The fathers reported appreciating a special forum to discuss and share views with other men.

The parallel Pen Green work arose from an analysis of reasons for the low level of involvement by fathers: that the centre was seen as a service for women and children; and attitudes that women are the primary caregiver of children. The first part of the Pen Green action worked on attitudes: raising awareness on how women "keep men out" and "why women may want a place of their own"; developing staff training on gender issues; and action research to work with men. Action included making the centre more "men friendly" by, for example, displaying photographs of men with their children, preparing a video to be used to examine how staff greet mothers and fathers when they bring their children to the centre, visiting fathers in their own homes to talk about their involvement in the home, writing to fathers and inviting them to meetings, and advertising specifically for male workers. The strategy involved an ongoing cycle of analysis, development, implementation, review, development, etc.

Information exchanges between Emilia-Romagna and Pen Green and preliminary meetings between the two groups began in 1990 and this led to the collaborative research project in Emilia-Romagna and Pen Green during the next few years.

One indicator of the impact of the work was that by 1994, two thirds of fathers whose children attended Pen Green either took their children to the centre or collected them, and a third

participated in a one week required "settling in" period when their children started. This represented a substantial change over 10 years. Although there was high male unemployment in 1983 when Pen Green opened, very few fathers took their children to the centre (Whalley, 1994). In both Reggio-Emilia and Pen Green, an increase in fathers' involvement in group work with parents was reported. The visibility of men has increased, e.g., in pictures displayed in the services where previously pictures of women and children had been shown. Issues of gender were discussed. There was broader debate about men as carers for children, e.g., Pen Green Centre held a national conference on the subject of men as carers, attended by 40 men and in Italy, educational work with children was developed to challenge gender issues. (The report did not specify how this was done.) The report concluded that early childhood centres can be strategic centres for promoting a culture of sharing responsibility for the care and upbringing of children.

Elements of the Pen Green work that were attributed to its success were:

- An analytic approach was taken by staff, who in turn reported being more aware of sex stereotypes, gender issues, and equal employment opportunities issues.
- Fathers' involvement was considered within the broad context of family responsibilities.
- Video footage of the child at home and in the centre was used. "When parents know that we are viewing and discussing video clips of their children they almost always show up" (Whalley, 1994, p.28).

The "professional development" described in this study came from the reflective and analytic approach taken within the services, as well as stimulation from contact between each other, access to research and a centre management that valued and supported ongoing professional development.

Some New Zealand and international evidence on professional development that assisted teachers/educators to work with families has been described in previous sections (de Vocht, 2001; Early Childhood Development, 2001; Jordan, 1999; McNaughton et al., 1996; Moriarty, 2001; Sauvao, 1995; Young-Loveridge, 1993; Young-Loveridge et al., 1995) and this will be summarised at the end of this section. In addition, the current NZCER research study, *Parent and whänau involvement in children's learning* will provide useful evidence on professional development aimed at extending parent involvement in early childhood education. The study is being done in collaboration with professional development advisers at Wellington College of Education and ECD, and researchers from Melbourne University's Centre for Equity and Innovation in Early Childhood Education.

Strengthening linkages between settings

There is powerful evidence of professional development associated with strengthened linkages between settings, changes in understanding about inequities associated with ethnicity, gender, child's age or socio-economic status, and challenging teachers/educators' deficit assumptions about children's abilities and knowledge. This evidence has been reviewed in different sections within this report but is brought together here to demonstrate common threads. There were significant benefits from such approaches.

Challenging deficit assumptions

- There were positive improvements in school achievement when deficit assumptions around ethnicity and income were challenged, and primary and early childhood teachers undertook professional development together in the Picking up the Pace study (Phillips, McNaughton, and MacDonald, 2002).
- There were changes to Swedish teachers/educators' views of the education of toddlers (teachers/educators recognised their role as educators, and provided greater stimulation and a broader programme) when teachers/educators were introduced to theoretical ideas and opportunity to collaboratively critically reflect on and analyse video recordings of their practice.
- Preconceptions about lack of richness in the lives of children from low income and ethnically diverse families were challenged when teachers used a simple questionnaire to find out about families and hobbies, expectations of the kindergarten, and ways families might contribute to the centre (Carr, 2000).

Challenging inequities

- There was greater discussion of gender issues, broader debate about men as carers, increased involvement of UK fathers in a centre's group work following analysis and work on attitudes and training in relation to gender issues and action research to work with men (European Commission Network on Childcare, 1995).

Strengthening linkages between settings

- There was greater involvement of parents in the programme and in children's learning at home when teachers were introduced to ideas about scaffolding and co-construction of learning, asked to think critically about their own beliefs, and collaboratively analysed video and audio transcripts of their interactions with children (Jordan, 1999).
- There were increased learning opportunities for children from non-English speaking backgrounds and involvement of parents in the programme when kindergarten teachers followed an action research spiral of collecting data, undertaking a needs analysis to develop their programme to meet the needs of their culturally diverse group, developing an action plan, evaluating and reading, developing a new plan etc (Early Childhood Development, 2001).
- Tongan families added to their styles of reading story books to their pre-schoolers when new educational ideas were introduced. Children's "non-immediate talk" increased – this is associated with literacy on entry to school (McNaughton, Wolfgramm & Afeaki, 1996).
- Samoan and Tokelauan parents in a Tokelauan early childhood centre became more confident in story telling and thought more about how to interact with the children when they took part in focused action research on shared reading, story telling, and song teaching (Sauvao, 1995).
- Action research supported parents in literacy practice and resulted in more literacy opportunities for children in two separate playcentre studies (Moriarty, 2001; De Vocht, 2001).

- Parents changed their perceptions of science and scientific learning (from an elitist view to an everyday perspective), became aware that they could play an active role in their child's scientific learning, and became more specific about their child's understanding of scientific thinking when teachers took part in a science teaching and learning programme and encouraged shared understanding with parents (through newsletters, activity booklets and direct sharing). Children asked more scientific questions at home after the intervention (Fleer, 1996).
- When teachers discussed mathematical ideas, used observations and parent interviews to identify children's interests, and incorporated resources and activities into the programme, there were significant gains in children's mathematics (Young-Loveridge et al., 1995).
- Pen Green used parent training sessions on child development and an ongoing cycle of parent led observations and feedback to staff, and staff led observations and feedback to parents, to bridge the "conceptual gulf" between teachers and parents. This enabled adults to be more responsive to the children and better informed in planning and evaluation (Whalley, 1997; Whalley & the Pen Green Team, 2001).
- The *Primary Early Childhood Link Project* held some joint professional development programmes on language and literacy with primary and early childhood teachers (G. Phillips et al., 2002). The shift in focus engendered by these programmes from pedagogy to do with performance to pedagogy to do with understanding of meaning in the narrative, contributed to the success of the programme in raising children's literacy levels in their first year at school. The strengthening of linkages between school and early childhood teachers may also have contributed to some additional advantages for children whose school and early childhood teachers both took part in the professional development.

Summary

Theoretical and research evidence emphasises that linkages between settings of home and early childhood service, school and early childhood service, and drawing on family and cultural perspectives help create coherence and continuity in children's lives. Strengthening these linkages can contribute to teachers/educators having much deeper insight into children's experiences, knowledge, and skills, so that they are able to draw on this knowledge in interacting with children and planning for their learning. There can be considerable positive impacts from creating partnerships, including enabling teachers/educators to move from assumptions about "deficits" for children who are different in culture or experience from themselves.

There are further benefits for children in developing strong relationships between home and early childhood service so that home and early childhood service practices reinforce each other. To draw intelligently from Bronfenbrenner's model is to come to an understanding of all the settings for children's lives. For many Pasifika children, the church and its pedagogy, as well as the family, are a feature. Mara (personal communication) argued that where parallel pedagogues exist, teachers/educators need to value both, as occurred in the McNaughton, Wolfgramme, & Afeaki (1996) study of reading strategies for Tongan pre-schoolers.

Involvement of families and community in the design, and implementation of professional development programmes offers an inclusionary process that may encourage teachers/educators to take on board and learn from others' perspectives, and vice versa. There have been shown to be benefits in such an approach to working with indigenous communities, and with families.

The practice of combining professional development across settings may lead to a greater understanding of each setting, enable new perspectives to be considered, and generate linkages between settings. There are risks too that need to be managed if the focus is on school content areas. Such a focus should not jeopardise the strength of outcomes from the strands and goals of Te Whäriki, since these promise the development of a broad range of skills, intentions, and inclinations. Combined professional development needs to show the benefits of Te Whäriki for school, not simply a push down of the school curriculum.

CHARACTERISTICS OF EFFECTIVE PROFESSIONAL DEVELOPMENT

This final section draws together evidence from studies described in previous sections focusing on **characteristics** of professional development that link to effective pedagogy and children's learning in early childhood settings. The section concludes by outlining gaps in evidence where further research is needed.

The characteristics of effective professional development are presented in eight major categories. These are:

- The professional development incorporates participants' own aspirations, skills, knowledge and understanding into the learning context.
- The professional development provides theoretical knowledge, content knowledge and knowledge and information about alternative practices.
- Participants are involved in investigating pedagogy within their own early childhood settings. Professional development advisers engage in these investigations.
- Participants collect and analyse data from their own settings. Revelation of discrepant data is a mechanism to invoke revised understanding.
- Critical reflection enabling participants to investigate and challenge assumptions and extend their thinking is a core aspect.
- Professional development supports educational practice that is inclusive of diverse children, families and whānau.
- The professional development helps teachers/educators change practice, beliefs, understanding, and/or attitudes. The professional development is emancipatory.
- The professional development helps teachers/educators to gain awareness of their own thinking, actions, and influence.

In addition, duration and intensity of professional development, characteristics of professional development participants, the professional development adviser, and organisation of the service were influential in supporting or hindering the ability of participants to learn from professional development and change their pedagogical practice.

Table 1

Characteristics of effective professional development linked to enhanced pedagogy and children's learning in early childhood education settings

The professional development incorporates participants' own aspirations, skills, knowledge and understanding into the learning context	**The professional development provides theoretical and content knowledge and information about alternative practices**	**Participants are involved in investigating pedagogy within their own early childhood settings**	**Participants analyse data from their own settings. Revelation of discrepant data is a mechanism to invoke revised understanding**	**Critical reflection enabling participants to investigate and challenge assumptions and extend their thinking is a core aspect**	**Professional development supports educational practice that is inclusive of all children, families and whānau**	**The professional development helps participants to change educational practice, beliefs, understanding, and/or attitudes**	**The professional development helps participants to gain awareness of their own thinking, actions, and influence**
The professional development takes on board participants' own aspirations, skills, knowledge, and understanding, and recognises the context for learning. This is a starting point: the programmes introduce new ideas and provide opportunity for participants to question their experiences and views, and not simply validate them.	Theoretical and content knowledge related to effective pedagogy is provided. This may be generic or content specific, such as generic areas of co-constructing learning, scaffolding, learning dispositions as outcomes of Te Whäriki, and specific areas such as early literacy, mathematical and scientific understanding, creativity. Content knowledge is integrated with pedagogical knowledge. The theoretical and content knowledge expands participants' knowledge base. Information and knowledge about alternative practices are provided.	The programme involves participants investigating real life examples of pedagogy within their own settings. Investigative methods, such as action research, are useful. Investigation by participants in issues within their own setting (e.g. interactions and behaviour) encourages work on issues that are important to participants and that make a difference to their own pedagogical practice. An external professional development adviser or researcher engages in the investigation.	A key process in contributing to revision of assumptions and understanding is "creating surprise through exposure to discrepant data" from the participant's own early childhood service. Understandable data that reveals "pedagogy in action" and others' views is helpful in these investigations. Useful approaches to data collection include collection and analysis of video and audio-tape recordings, observations, surveys of others' views, and assessments of learning. The professional development programme supports data collection and analysis.	Critical reflection involves teachers/educators in investigating and challenging their assumptions. This in turn encourages insights and shifts in thinking. This is particularly valuable in challenging deficit views associated with ethnicity, socio-economic status, child's age, parental knowledge, and gender. Some conditions that encourage critical reflection: 1) collaboration with others and being exposed to their views. These views include views of colleagues, professional development advisers, parents, and children; 2) using deeper or different theoretical understanding; 3) teachers/educators thinking about their own thinking, e.g. through use of journals and diaries.	Professional development supports practice that is inclusive of all children, families and whänau. Its focus is on pedagogy that understands, values, builds on and extends the competencies and skills that every child brings to an early childhood setting. It supports participants to work closely with families so that both are better informed about and able to extend the child's experiences and learning. Professional development in support of inclusive practice helps participants analyse data obtained through close observation of relationships between children and people, use formative assessment, and offer curriculum differentiation.	Professional development is linked to tangible changes in pedagogical interactions and this in turn is associated with children's learning in early childhood settings. The professional development helps participants to change educational practice, beliefs, understanding, and/or attitudes. Participants are encouraged to investigate ideas and practices that stand in the way of an equitable society. Participants may become aware of ways in which they disempower or limit groups or individuals.	The professional development assists participants to gain greater awareness and insight into themselves, and a stronger appreciation of the power of their role as educators.

Mitchell, L. and Cubey, P. (2003) *Characteristics of effective professional development linked to enhanced pedagogy and children's learning in early childhood settings: Best evidence synthesis.* Wellington: Ministry of Education.

The professional development incorporates participants' own aspirations, skills, knowledge, and understanding into the learning context

The professional development programmes incorporated the participants' own aspirations, skills, knowledge, and understanding, and recognised the context for learning. However, this was a starting point only: the programmes introduced new ideas and provided opportunity for teachers/educators to question their experiences and not simply validate them.

This occurred in a number of ways:

- Through participants volunteering to take part, or stating that they wanted to be involved. This occurred in the professional development programmes reported by Carr et al. (2000), Jordan (1999), Phillips, McNaughton, and MacDonald (2002). Blenkin and Hutchin (1998) found in their action research case studies in a variety of settings in the UK that motivation and confidence of practitioners had an effect on whether they changed their practice, with unmotivated participants not making developments, and some who were less confident seeming to be inhibited by the research staff.
- Through participants having choice about the focus of their topic. For example, participants in Carr et al.'s (2000) research study using action research in relation to evaluation in early childhood settings chose the "child's question" that they wanted to evaluate. Jordan (1999), in her professional development programme on planning processes to extend children's thinking, used the children who were the current focus of the centre's specific planning, to become the focus children for the project. Participants in the Australian Pre-School Literacy Project (Raban et al., 1999; Ure & Raban, 2001) and New Zealand's "Picking up the Pace" study (Phillips, McNaughton, & MacDonald) chose their own literacy goals. Moriarty (2001) surveyed parents about their knowledge and views of writing, and constructed an action plan with the whole centre.
- Through the professional development programme acknowledging and extending participants' knowledge and understanding. For example, in McNaughton, Wolfgramm, and Afeaki's (1996) professional development with Tongan families on styles of reading story books to their children, the role of "performance styles" within the families' own views of learning and within church pedagogy was acknowledged. The researchers did not discount or try to replace these styles, but rather added to them with the introduction of "another way". Langley's (1997) study of professional development to help kindergarten teachers manage children with severe behaviour disorders did not effect teacher change when the researcher was not explicit enough about establishing acceptable criterion for individual children. Langley acknowledged that the kindergarten teachers' ability to do this themselves may have been overestimated. In the Australian Pre-School Literacy Project the researchers found out about pre-school teachers' understanding of literacy development and used this as a basis for the programme design.
- Through the professional development starting from where the participants are and what they hope to learn about, develop, and achieve. Teachers in Young-Loveridge et al's (1995) study were involved in an Advanced Qualifications paper throughout the study where they extended their knowledge of children's mathematics.

The role of the professional development adviser changed over the course of the professional development programme in most studies, from a directive role at the start to minimal support or monitoring. Jordan (1999) noted that this shift in roles is consistent with principles of action research and with scaffolded learning. For participants who were less knowledgeable about theoretical and content issues, more time needed to be spent at the start on these issues. Merriam (1993, p.9) noted that "adults who know little or nothing about a topic benefit from teacher directed instruction until they have enough knowledge to begin directing their own learning". Carr et al. (2000) highlighted the diversity of knowledge and confidence in assessment practices and working with Te Whäriki of the practitioners in their study. This resulted in very different emphases within the course of the action research cycle. The importance of starting with participants' own knowledge base helps explain why professional development with a diversity of participants, especially when they have different qualifications, may be particularly difficult.

The professional development provides theoretical knowledge, content knowledge and knowledge and information about alternative practices

Theoretical and content knowledge related to effective pedagogy was offered. This was both generic and content specific, such as generic areas of co-constructing learning, scaffolding, learning dispositions as an outcome of Te Whäriki, and specific areas of early literacy, mathematical, and scientific understanding. The theoretical and content knowledge expanded the educator's knowledge base. In most programmes, knowledge and information about alternative practices was provided.

Many of the concepts being introduced were theoretically complex. For example, Carr et al.'s (2000) learning stories approach requires an understanding of the purposes of assessment and of how children learn. Jordan (1999) based her programme on scaffolding of children's ideas, co-construction of learning, and the role of documentation of dialogue through video and audio tape recordings in developing projects. Pramling's (1996) and Palmerus and Pramling's (1991) mediation categories required adults to appreciate and practice how adults could mediate between the child's experience and the environment in ways that influence the child's communication, understanding of meaning, metacognitive awareness, and feelings of competence. Theoretical understanding offered a basis for building understanding of children's feelings, intentions, and experiences and of the role that can be played by the educator.

There was evidence that those participants who were less well educated had more difficulty in using these complex pedagogical strategies. Carr et al. (1998) found that less confident teachers/educators and less well educated participants required more time, and more support from the action researcher, than those that were better educated. They stated that they would have liked to spend more time with them on theoretical issues. Likewise, Pramling's (1996) study showed links between qualifications of staff, and the ability to find out the child's thinking and to use the complex mediational strategies. Blenkin and Hutchin's (1998) successful case studies involved mostly trained staff.

Specific curriculum content areas were goals of some professional development programmes. These were in areas of mathematical and scientific thinking, and early literacy. There were two features of these programmes: provision of content knowledge about specific areas; and

integration of content knowledge with pedagogical knowledge. For example, Fleer (1996b) integrated her programme of units with a scientific focus with a pedagogical approach based on finding out children's understandings, children asking questions and investigating their answers. Young Loveridge et al's (1995) programme provided knowledge about mathematical concepts and provided resources. Where the professional development programme was more effective, teachers learned to pick up on mathematical ideas and build on existing activities and talk, rather than plan a structured programme. "Teaching" specific content knowledge was not an end. Rather content knowledge was a base from which to extend children's understanding, by giving teachers/educators more resources to draw from. Farquhar (2003) has summarised evidence about the place of content knowledge in early childhood programmes.

According to Timperley and Robinson (2001), one of the three critical conditions for schema revision is knowledge about alternative practices. Information about alternative practices was provided in many of the professional development programmes. Carr et al. (2000) provided information about alternative assessment practices. The professional development programmes on literacy (Phillips, MacNaughton & McDonald; Raban et al., 1999; McNaughton, Wolfgramm, & Afeaki, 1996; Sauvao, 1995; de Vocht, 2001) all gave information or demonstrated alternative practices, for example for adult interactive strategies during story reading, bringing the print down to child's level, shared reading and setting up opportunities for writing. Demonstration of alternative practice was provided through a resource kit video of a teacher teaching within a constructivist framework in Watters et al. (2001) professional development programme on science.

Participants are involved in investigating pedagogy within their own early childhood settings. Professional development advisers assist in data collection and ongoing critique

Involvement in investigation within the participants' own setting encouraged work on issues (e.g., interactions and behaviour and the resourcing of their setting) that would make a difference to participants' own practice. It enabled the learning to be meaningful to participants, an element that Merriam and Caffarella (1999) distinguish as important in adult learning.

There is evidence that active methods of professional development are more likely to result in change to practice than passive methods. Sexton, Snyder, Wolfe, Lobman, Stricklin, and Akers (1996) surveyed 242 people working in early intervention services in early childhood education about their perceptions of the relationships of different in-service training methods and changes in practices. Generally, passive techniques were rated as less likely to bring change than dynamic strategies including teacher modelling, small group discussions, and opportunities to practice targeted skills.

Most of the programmes involved teachers/educators investigating real life examples of pedagogy within their own settings. For example, teachers in Jordan's (1999) study investigated and analysed verbal interactions with a focus on critical questions about how staff are scaffolding children's learning. Swedish teachers investigated and analysed teacher centred and child centred aspects of learning where an adult mediates between the child's experiences and the surrounding environment within their centres (Pramling, 1996 and Palmerus and Pramling, 1991). The Effective Early Learning Project (Mould, 1998; Ramsden, 1997; Pascal, 1999) involved

investigation and analysis of adult engagement and child involvement within the services. The self-review programmes (Blenkin & Hutchin, 1998; Blenkin & Kelly, 1997; McLachlan Smith, Grey & Haynes, 2001; Depree & Hayward, 2001) used action research methods within participants' settings. Langley's (1999) study of behaviour management involved systematic investigation and analysis of teachers' own responses to children with severe behaviour disorders. In literacy programmes (e.g., Phillips et al., 2002b; Ure and Raban, 2001), teachers analysed examples of their own practice.

A characteristic of the professional development programmes that seemed to make a difference in helping participants change was the depth of the investigation and the extent to which participants thought about, discussed, and questioned the data and information. Action research and professional development adviser or researcher/practitioner partnerships involving the outside adviser/researcher in actual work within the centre provided useful approaches for this work.

Carr and Kemmis (1986, p.162) defined action research as:

> *a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out.*

They argued that three conditions are necessary for action research:

- the subject is a form of social practice which is seen as open to action and capable of improvement;
- the method of action research is a self reflective cycle of spirals of planning, acting, observing and reflecting; and
- the project includes those responsible for the practice and is based on collaboration.

Critical reflection and investigation of data leading to changed practice is part of action research. Action research is research for education, not research about education and contributes to educational practice.

In the studies examined in this synthesis, there were different levels of engagement by the professional development adviser in the investigations within the setting and subsequent analyses. Approaches included:

- The practitioners collecting their own data with assistance by the professional development adviser, and analysing this data in collaboration with the researcher/professional development adviser (Carr et al., 2000; Depree & Hayward, 2001; Phillips, McNaughton & MacDonald, 2002b, Fleer, 1996b).
- The researcher/professional development adviser observing, giving feedback, and collecting data within the participants' setting and analysing it in collaboration with the participants. (Effective Early Learning Project; Langley, 1999; Jordan, 1999; Pramling, 1996 and Palmerus & Pramling, 1999; Mould, 1998). In this approach the professional development

adviser was not "hands on" in data collection in later stages of the programme, but retained a critical analysis role.

- Support for self-review. McLachlan-Smith, Grey and Haynes (2001) reported on a programme offering 4 workshops over a range of topics and 2 visits from project support persons, but this is not similar to the intensive work described in the above two approaches. Their evaluation did not examine impact on pedagogy.

Carr and Kemmis (1986, p. 202) made distinctions between "top down" models and "practical and emancipatory" models. They warned that "technical action research" can occur when an outside facilitator or researcher co-opts teachers/educators to work on the researcher's issues rather than develop their own focus. While the focus needs to be "owned" by practitioners, intensive input by professional development advisers in providing assistance to practitioners in investigating their own setting and collecting data, and a continuing role of critiquing work was evident in effective professional development programmes.

Participants analyse data from their own settings. Revelation of discrepant data is a mechanism to invoke revised understanding

Timperley and Robinson (2001, p.283) cited evidence that a key process in contributing to schema revision is "creating surprise through exposure to discrepant data".

Carr et al.'s (2000) evaluation of the trialling of Action Research Tools is useful because of its focus on different types of data collection tools. The most valuable tools were those that:

- generated the most reflective discussion by challenging assumptions and providing data that made sense;
- included early discussions about criteria;
- did not put staff down;
- included peer observations of each other in an atmosphere of trust;
- could be translated into a chart that offered an accessible and easily read evaluation; and
- reflected the interests of staff and/or parents in a setting.

Their most highly rated action research tools had benefit in helping practitioners to respond to diversity, because they could be used to evaluate teaching practice in respect to all children across particular strands of Te Whäriki.

All the professional development programmes collected data. Tools included:

- collection of video and/or audio-tapes of interactions for later analysis, by teachers/educators, parents, and/or children. Video was powerful because of the opportunity it gave to "revisit educational experiences";
- observation and recording of child's and educator's interactions. Close observation could be a powerful diagnostic tool as Blenkin and Kelly (1997) noted;
- photographs of children and teachers/educators at work;
- questionnaires to parents to find out their views, about their lives, and experiences at home;

- parent interviews; and
- assessments of children's learning.

Critical reflection enabling participants to investigate and challenge assumptions and extend their thinking is a core aspect

Critical reflection involved participants in investigating and challenging their own assumptions, and this in turn encouraged insights and shifts in thinking.

Some conditions encouraged critical reflection:

- Collaboration with others and being exposed to their views. These views include views of colleagues, professional development advisers, parents, and children.
- Using deeper or different theoretical understanding.
- Teachers/educators thinking about their own thinking, e.g., through use of journals and diaries.

Collaboration with others and being exposed to their views

Providing professional development to all the players in an early childhood service seemed to be more effective in bringing about change than working with individuals. This was the approach taken by most of the professional development programmes. In one of the programmes offering guidance on self-review (McLachlan-Smith, Grey, & Haynes, 2001), one of the reported barriers to implementing self-review was the difficulty of bringing on board others who did not attend workshops. If professional development works on "real life" meaningful issues, those who do not participate will not have the opportunity for new learning.

A main reason why interaction with others brings change is the exposure to different views brought by such an approach. Professional development involving interaction with others, and requiring a degree of questioning, enables a different picture of views, attitudes, and pedagogy to be highlighted. As Brookfield (1998, p.1907) stated, "Viewing what we do through these different lenses alerts us to distorted or incomplete aspects of our assumptions that need further investigation." Some of the professional development programmes gave examples of the kind of "reflective questions" that could prompt reflective thinking:

- Carr et al's (2000) children's questions. (Do you let me fly? Do you know me? Can I trust you? Do you hear me? Is this place fair?)
- Jordan's (1999) critical questions about scaffolding children's learning, about teachers/educators' own beliefs and practices, about how teachers/educators could find out about children's thinking and extend their learning.
- The Quality Journey resource kit's (Ministry of Education, 1999) reflective questions for use in early childhood settings.

The professional development facilitator or researcher played a key role in giving their own views, offering feedback, sometimes modelling strategies, and mentoring. Brookfield (1997) stated:

> *One of my strongest convictions about critical thinking is that students learn to think, write, and speak in critical and democratic ways by watching respected leaders in positions of power and authority model these processes in their own lives. So, one of the first things that teachers of critical thinking need to do is make sure that they model a public commitment to and engagement in critical thinking before they ask their own students to engage in critical thinking (Brookfield, 1997).*

Professional development can also help teachers/educators think about tools for finding out about others' views and encourage their use, as occurred for participants in Carr et al.'s (2000) research study – where simply asking parents about their interests, expectations of kindergarten, and what they would like to contribute, challenged teachers' preconceptions about lack of richness in children's lives. There is now a growing body of ideas on responding to "the voice of the child" and ways to bring their experiences and viewpoints into the equation are being explored. Clark and Moss (2001) describe participatory methods for listening to young children that could be used in a variety of early childhood settings.

Theoretical understanding

Theoretical ideas offer another view that can assist teachers/educators to see their own educational practice and pedagogy in different ways. In many of the professional development programmes new theoretical understanding assisted teachers/educators to develop a finer appreciation of the active role they can play in children's lives.

Theoretical understanding in relation to Mäori children needs to include understanding of cultural values, beliefs and practices and their place within the context for learning.

Theoretical understanding in relation to Pasifika children needs to include an appreciation of the range of metaphors and models that have been expressed in relation to Pasifika learning and teaching including the fale, the coconut tree, and the Tivaevae.

Teachers/educators thinking about their thinking

Pramling Samuelsson et al. (2000) encouraged teachers/educators to become consciously aware of their own thinking and to reflect on this through asking them to keep a diary, and through discussion of ethical dilemmas.

Effective professional development supports educational practice that is inclusive of all children, families and whänau

An empowering model of education provides a framework for examining characteristics of professional development that support educational practice that is inclusive of all children, families and whänau. An empowering model takes a credit based approach to children's achievements and recognises children and their families as active in co-constructing learning. Early childhood teachers/educators can exclude some experiences, knowledge and practices, particularly when these are different from their own, while counting others as "capital".

Tizard's (1985) study of four year old working class girls is a graphic example of teachers discounting experiences, knowledges and practices operating in the home and the impact of this discounting on teachers' interactions. She showed the girls' parents provided a "powerful learning environment that was language rich". However, at nursery school, teachers used a less mature speech style when talking to working class girls than talking to middle class girls. They made less frequent use of language for complex purposes, were less likely to initiate conversations by questioning, their questions were pitched at a lower level and they gave a more restricted range of information. They were more likely to ask intellectually easy questions.

> *On the very threshold of the children's school careers, teachers were responding to the apparent, rather than the real, abilities of working class children, tending to underestimate what they could achieve, and presenting them with inappropriately low level tasks (Tizard, 1985, p.2).*

Teachers/educators who understand, value, build on and extend competencies and knowledge that every child brings to the early childhood service will support inclusive educational practice for all children, families and whānau. Siraj-Blatchford et al.'s (2002) analysis of effective pre-school settings (described on page 15) highlighted the importance of curriculum differentiation in identifying the needs of individuals and small groups of children, and the role played by formative assessment in provision of experiences that are cognitively challenging. A critical question is how to find out about children's experiences and previous learning.

These findings are pertinent to the question of what characteristics of effective professional development support inclusive practice, suggesting that the following approaches are important: professional development that incorporates analysis of data obtained through close observation of relationships between children and people; formative assessment; professional development that supports pedagogy that builds on children's knowledge and experiences; and professional development that supports teachers/educators to build linkages between home and early childhood service.

Some of the professional development approaches in this synthesis showed these features. These included professional development on the trialling of the Action Research Tools that concentrated on "the child's questions" (Carr et al. 2000), professional development on scaffolding (Jordan et al., 2000), mediating learning experiences (Pramling 1996; Palmerus & Pramling, 1991) and adult engagement and child involvement (Mould, 1998; Ramsden, 1997) where close observation and analysis was made of recorded interactions. Common to these approaches was their examination of the experiences of the child. To ensure adults are catering for all children, however, analysis of interactions with individual children and small groups of children needs to be made, as occurred in the Swedish mediating learning experiences approach. This study was also outstanding in showing how teachers can work to understand and mediate learning experiences for toddlers, at an age when the toddlers are not able to communicate verbally. By contrast, Jordan's (1999) study chose 2 or 3 children in each setting for observation.

An ability to examine the experiences of individual children may be particularly difficult in those New Zealand services that have large groups with high teacher:student ratios.

Hill and Hill, Comber, Louden and Reid (2002) generated a number of conclusions from their study of the early literacy development of 100 children in Australia. Those related to teachers' interactions were:

- teaching which makes a difference is based on a careful analysis of what children can do already and what they can learn; and
- literacy lessons which engage children make use of familiar language, processes, genres, concepts, information and media whilst introducing new practices.

Close linking between home and early childhood setting enables parents and teachers/educators to become better informed about children's concerns and previous learning, and better able to plan effectively and offer a curriculum that recognises and builds on these. Respectful relationships between teachers/educators and parents enhances children's sense of wellbeing (Whalley, 1997a). The literacy studies in this synthesis did not emphasise strong connections between children's home and early childhood service experiences in terms of language and literacy practices, or careful investigation of what children could already do, although they challenged teachers/educators to increase their understanding of early literacy development and their repertoire of pedagogical strategies. Phillips, McNaughton & MacDonald (2002b) stated that they drew on "rich text activities" using books that drew on children's social and cultural identities, and they worked from aims to strengthen linkages between home and school/early childhood centre, but the extent to which connections were made was not evident in their report. De Vocht (2001) emphasised "relating the child's responses to life experiences" and within a playcentre setting would have had available a huge source of parental knowledge.

Some professional development helped teachers/educators find out about children's interests and experiences by surveying parents or engaging with them in planning and assessment. Pen Green (Whalley et al., 2001) had the most complex and thorough systems for developing a working partnership between parents and staff, and the First Nations Programme (Ball & Pence, 2001) for working with indigenous communities.

The professional development helps teachers/educators to change pedagogical practice, knowledge, and beliefs

The studies described in this synthesis provided evidence of professional development linked to tangible changes in pedagogical interactions and this in turn was associated with children's learning in early childhood settings. Gould (1997) describes "successful" professional development as professional development that helps teachers change. Change may occur in pedagogical practice, teachers' beliefs, conceptual understanding, and attitudes. Wood and Bennett (2000, p.636) gave references for the now "extensive stock of empirical data which attests to the effectiveness of achieving meaningful change by addressing teachers' existing knowledge, beliefs and practices". This suggests that uncritical implementation of procedures is not likely to be productive. Rather, what is needed is an active generative process that entails teachers making change at various levels.

The evidence on the impact of professional development on effective pedagogy and children's learning supports a view that change at these levels may be interrelated. Professional development programmes that were associated with effective pedagogy (Pramling, 1996; Pramling & Palmerus,

1991; Pramling Samuelsson et al., 2000), and with enhancing children's literacy competencies (Neuman, 1999; G. Phillips et al., 2002; Raban et al., 1999; Ure & Raban, 2001) and mathematical competencies (Young-Loveridge, 1993; Young-Loveridge et al., 1995) addressed all these areas in the design of the professional development programme. The importance of addressing teachers' beliefs was brought home strongly in the examination (p.55) of Neuman's (1999) professional development and book supply programme, where initial professional development was unsuccessful because it did not take teachers' beliefs on board.

Gould (1997) reviewed evidence showing that teachers' own experiences of education exert powerful influences, and changing beliefs is hard. As well, teachers/educators may not be aware of their beliefs. She discussed evidence that changing beliefs in itself does not lead to changed practice, and that commitment to change is also important.

In one study, teachers believed that their practice had changed, but evidence indicated that it had not. Langley's (1997) pilot professional development programme to train teachers in a Christchurch kindergarten in skills to better manage children with severe behaviour problems did not change the management behaviour of teachers, although teachers thought this had changed. Two teachers thought the training had helped them refocus on positive behaviour. The teachers thought children's behaviour had improved, but observational evidence showed inconsistent changes in children's behaviour. One implication is the importance of assessing actual changes in pedagogical practice when evaluating professional development programmes. In the Langley study, the findings from the pilot study led to more active involvement from the researcher in problem analysis, goal setting, and treatment design.

The professional development helps teachers/educators to gain awareness of their own thinking, actions, and influence

Several of the professional development approaches provided evidence of teachers/educators having greater awareness and insight into their thinking and actions, and a stronger appreciation of the power of their role as teachers/educators. Blenkin and Kelly (1997) found some teachers/educators becoming conscious of advances in their own thinking, after close observation and analysis of their practice. Pramling and Palmerus (1991) found a greater awareness by teachers/educators of the need for education of toddlers following participation in an intensive professional development programme involving theory, data collection, and group analysis of interactions within their early childhood setting.

Cannella (1997, p.169) argued for early childhood education to be reconceptualised "as the pursuit for social justice for younger human beings", with new frameworks for action, such as how to respect each other, recognition of multiple realities, the belief in the inhumanity of creating others as objects, the practice of democracy, and how to take radical action.

Critical reflection is particularly valuable in challenging deficit views associated with ethnicity, socio-economic status, child's age, parental knowledge, and gender. As such, critical reflection is likely to be a key component of professional development approaches that aim to foster equitable pedagogical practices. In most of the professional development approaches using critical reflection, teachers/educators became aware of ways in which they disempowered or limited groups or individuals. These have been reviewed in the previous section on pages 77–79.

Critically reflective thinking has centrality in adult learning theory as a condition for learning to recognise and challenge ideology in everyday thoughts and actions, and in the institutions of civil society (Brookfield, 2001).

Structural features of effective professional development

There is some evidence that the duration and intensity of the professional development programme, depth of involvement of the professional development adviser, and whole service participation in professional development programmes may influence the power of professional development programmes to contribute to enhanced pedagogy and outcomes for children. Characteristics of professional development participants, characteristics of the professional development adviser, and organisation of the service are also important variables in influencing effectiveness.

Features of professional development programmes

Duration and intensity of professional development

Many of the effective professional development programmes reviewed in this synthesis took place over an extended time period. Professional development programmes took place over 12 months on children's learning dispositions (Carr et al., 2000), 19 months on mediating learning experiences (Palmerus & Pramling, 1991; Pramling, 1996), 18 months on scaffolding children's cognitive learning (Jordan, 1999), 12 months and 8 months on adult engagement and child involvement (Mould, 1998) and (Ramsden, 1997) respectively, and 18 months and 30 months on self review where the focus was chosen by participants (Blenkin & Hutchin, 1998; Blenkin & Kelly, 1997). Two researchers (Carr et al., 2000; Pascal, 1999) stated that longer timeframes could be needed for teachers/educators who started with little theoretical understanding, practical experience, or low levels of confidence. Pascal (1999) also stated that those educators who need to make fundamental improvements could need a longer timeframe.

However, other effective professional development programmes were much shorter. Professional development took place over 4.5 weeks on behaviour management for kindergarten children with a severe behaviour disorder (Langley, 1997), 20 weeks on reading to children, guided reading and telling or retelling stories (Phillips, McNaughton & MacDonald, 2002), a 2 hour session and 3 or 4 meetings on a literacy goal chosen by the teachers (Raban et al., 1999, Ure & Raban, 2001), 1 session focused on responding to the child's initiations by talking about the story, similar events and objects, and other books (McNaughton, Wolfgramm & Afeaki, 1996), 2 professional development sessions on interactive strategies during story reading (de Vocht, 2001), 3 months on writing opportunities for children (Moriarty, 2001), and 5 units with a scientific teaching and learning focus (Fleer, 1996b).

In the programmes where a generative curriculum model was followed and input from community members (parents in Pen Green Centre for Under 5s and their Families, First Nations elders, instructors and community resource people in the First Nations Partnership Programme) was a necessary part of the model (Whalley et al. 2001; Ball & Pence, 2001), ongoing opportunities for engagement of community and teachers were necessary. These processes of engagement enabled co-construction of goals, programme development and assessment. Rather than being "professional development" in the sense of a professional development adviser working with early childhood teachers/educators, they exemplified a process of ongoing data collection, critical

discussion and reflection, planning and action amongst teachers/educators and the wider community.

Examination of these findings about duration and professional development programme focus leads to some tentative generalisations. We cannot say that longer programmes are more beneficial: the desirable length of programmes depends on their focus. Programmes that concentrate on discrete goals such as behaviour management of behaviour disordered children, precise aspects of telling stories or a specific goal chosen by teachers, could be effective within a short timeframe. Those that work on abstract concepts, complex theoretical understanding and interactions across many contexts, such as scaffolding and co-constructing cognitive learning, mediating learning experiences and integrating observation, planning and assessment, will probably need longer.

An identified characteristic of effective professional development programmes is involvement of participants in investigating and acting within their own settings, collecting data and getting feedback. Focus may be achieved through intensive opportunities to practice. Time within professional development may be taken up with "finding a focus". This task spreads out time needed for professional development, although it may be a useful way to ensure the programme addresses the goals and needs of participants. There is evidence from one of Carr et al.'s (2000, p.28) case studies that length of time between professional development meetings is a factor in achieving goals within a desired timeframe. Spreading the time periods may slow change.

While investigation and practice within a setting are features of professional development leading to improved pedagogy and outcomes for children, this does not imply a lack of value in one off seminars and conferences, which may play a role in "awakening interest" or ongoing reflection being challenged through exposure to new theoretical ideas and views. It is unlikely however, that such opportunities on their own would directly change practice.

Intensity of involvement of professional development adviser

Focus may also be achieved through intensive input and critical feedback from the professional development adviser/ researcher. In many studies the value of having an external professional development adviser or researcher to mediate development was evident, and in some there was a view that change would not have occurred without that person's intervention (e.g., case studies in the Carr et al. 2000 work).

In most studies, the professional development adviser/researcher took a hands on role within the setting in establishing goals, observing teachers/educators, giving feedback and planning. Timperley and Robinson (2001) gave evidence that the presence of an external agent to assist with data collection and analysis is a critical condition for schema revision. Likewise, Carr et al. (2000, p.34) found that some staff recognised the usefulness of an external facilitator "in helping to challenge the tendency of staff to want to justify findings that were unfavourable".

Researchers in the learning and teaching stories evaluation (Carr et al. 2000) played a strong role at the beginning of the project in trialling tools, reviewing data and planning. Jordan (1999) videotaped selected children before, during and after a planning focus on the children, asked participants critical questions in relation to these, and jointly analysed earlier and later transcripts with participants. Researchers in the Swedish project on mediating learning experiences

(Palmerus and Pramling, 1991; Pramling, 1996) video-recorded the interactions between children and staff every month and took part in a group session with staff to analyse these. Researchers in the Effective Early Learning Project (Mould, 1998; Ramsden, 1997) collected data and observations throughout the programme and discussed and evaluated the data with teachers. The Principles into Practice in Early Childhood Education Project involved the researcher and educator both contributing to data collection and analysis. Researchers set goals for teachers to engage in specific reading, guiding writing and telling stories activities at least three times a week in the Phillips, McNaughton and MacDonald (2002) project on literacy, language and teaching. Sauvao (1995) modelled teaching, observed teachers and gave feedback in her programme on shared reading, story telling and song teaching. Moriarty (2001) was directly involved in all phases of the action research project on enhancing writing opportunities. There is ongoing data collection, input and analysis by parents and researchers in Pen Green's work with parents (Whalley et al. 2001) and by researchers and First Nations community members in the First Nations Partnership Programme (Ball and Pence, 2001).

Insight on the importance of intensive input comes from examination of programmes where this was not sufficient. Carr et al. (2000, p.24), reporting on one of the centres used to assess their action research tools, noted that a more effective use of time for this centre would have been provision of more intensive professional development at the start of the project, and more time to explore needs, issues and concerns and introduce the learning stories framework. They thought a more conscious focus on the action research process would have followed the needs of the centre more closely and addressed them effectively. Langley's (1997) behaviour management programme indicated that target children's behaviour improved only when there was intensive involvement of the researcher in problem analysis, goal setting and establishing a Criterion of Acceptable Performance for the teacher's positive responses.

The intensity of the professional development adviser's input and feedback varies at different stages in the programme, and for different types of service. Jordan (1999) noted changes in the role of the professional development adviser over time from direction to minimal support, and parallel changes in the role of the teachers from responding to independence. Carr et al. (2000) noted that increasingly staff or parents took over in all centres, and the researcher's role moved from direction and reassurance about action research to "devil's advocate."

An issue for services that experience changes of teachers/educators, such as playcentres where parents leave and new parents join, or centres with major staff changes, professional development programmes is how to bring new teachers/educators on board. This is one of the challenges to be examined by Wilton Playcentre which was designated as a Centre of Innovation in April 2003.

Whether all teachers/educators from the service are participants

One study highlighted the benefit of whole service approaches to professional development and barriers in motivating or bringing on board staff who were not part of the professional development. This was evident in McLachlan-Smith, Grey and Haynes' (2001) account of the professional development programme using *The Quality Journey*. Other studies all used whole centre approaches to professional development.

In Royal Tangaere's (1997a) model of Mäori pedagogy, and Bronfenbrenner's (1979) ecological model of human development, the interrelationships between people within the settings

experienced by the child and with broader systems influence the child's capacity to learn and wellbeing. Poor or weak relationships work against the interests of the child. Working with whole centres is productive because it enables all teachers/educators to build common understandings and reinforce each others' practice. In addition, involvement of all participants from a service provides views from the range of perspectives and is useful in programme evaluation. Based on this framework, professional development involving all the staff in an early childhood setting is likely to make it easier for them to work together from a common understanding and appreciation.

Participants

Training and qualifications

Several of the studies found that training, qualifications, and the level of education of participants made a difference to the time required and ability to learn from the professional development programme and make changes to pedagogical practice, beliefs, understanding, and/or attitudes.

- The Effective Pedagogy in the Early Years study found distinctions in what staff did according to their levels of early childhood training.

> *We found in both interviews and observations that trained teachers used the most sophisticated pedagogy, including sustained shared thinking. When less qualified staff were working with qualified teachers we found significantly more sustained shared thinking interactions than when they worked alone or with other less qualified staff (Siraj-Blatchford et al., 2002, p.14).*

- In addition, qualified teachers and staff with "educare" training spent the greatest proportion of time working with children on literacy activities. Qualified teachers also spent more time than other staff on mathematics activities, while untrained staff spent more time on creative activities.
- Most of the participants in the "successful" case studies in Blenkin and Kelly's (1997) Principles into Practice in Early Childhood Education project where teachers/educators recognised what was happening in practice, re-evaluated practice, and looked at alternatives, were trained teachers, rather than untrained staff.
- Pramling (1996) found that less well educated nursery staff tended to use more mechanical aspects of mediating between the child's experiences and the surrounding environment, than those who were better educated and had greater interest in educational methods.
- Carr et al. (2000, p.48) found that differences in centre practitioners' prior knowledge about and confidence with Te Whäriki made a difference to the time and processes required for the action research. Those who were highly trained, confident, and knowledgeable were able to implement the Learning Stories Framework with understanding and insight. "Less confident staff required more guidance from the action research facilitators and covered less ground."

These findings highlight issues for New Zealand settings, where qualifications and training of teachers/educators vary between services and within services. The pace and focus of the professional development programme needs to be geared to the characteristics of participants. This holds particular challenges in services where there is a mix of qualified and unqualified

teachers/educators, as there are in many of New Zealand's education and care centres, köhanga reo and Pasifika centres, and in some playcentres. The Blenkin and Kelly (1997) study found that working with individuals with different needs and goals seemed to inhibit progress. However, the finding reported by Siraj-Blatchford above, suggests that better qualified staff may help scaffold the learning of those who are less well educated, and Carr et al. (2000, p.36) found a factor in the success of one of their childcare centre case studies to be a "professional partnership . . . with the two senior staff, both of whom modelled the ability to reflect and critique centre practice".

An issue in undertaking whole centre professional development with mixes of qualified and unqualified educators is for the professional development adviser to provide challenge and stimulation to all participants, rather than work from the basis of the lowest level of understanding and skills. This may require differentiation within the professional development programme and active support for qualified teachers to become mentors.

Diversity of backgrounds

Participants may come from a diversity of backgrounds. The characteristics of effective professional development outlined above, indicate that the starting point for professional development needs to be participants' own aspirations, skills, knowledge, and understanding. It may be more difficult to start here when the professional development advisers have different backgrounds from the professional development participants.

The professional development advisers' own beliefs and knowledge may prevent them from recognising and valuing participants' beliefs and knowledge when these are different from their own, especially when they contradict "professional knowledge". Professional development advisers themselves need to ensure their approach to professional development is not a deficit approach.

Professional development with parents illustrates this issue. McNaughton, Wolfgramm, and Afeaki's (1996) approach to professional development with Tongan families did not discount the families' valued ways of story telling and church pedagogy, but built on and extended this. A process of power sharing with parents was evident in the Pen Green model of professional development with parents.

Motivation

Resistance to professional development constitutes a barrier to change. For example, McLachlan-Smith, Grey and Haynes (2001) reported that resistance to self-review was a barrier for some parents in playcentres. This suggests that a philosophical commitment to the focus of the professional development is helpful, but this cannot occur through prescription. One way to motivate teachers/educators is to provide a professional development programme that is of high quality and has meaning and value for participants. This process of finding meaning was evident in one of the Carr et al. (2000) case studies in a playcentre where introduction of learning stories and dispositions and use of video recordings for analysis gave playcentre parents "a new impetus" that helped overcome initial uncertainty and apprehension. Another kindergarten case study found that self-evaluation action research tools that "connect with what is valued by staff within a particular service . . . will have the greater chance of success" (Carr et al., 2000). One reason why

an action research approach is effective is because it helps participants investigate their own issues within their own early childhood setting.

Professional development adviser

The processes and experiences that make for effective professional development require highly skilled, knowledgeable, and critically aware professional development advisers. The professional development adviser needs to be able to work with practitioners through processes described in our framework: *Characteristics of effective professional development*. On this basis, professional development advisers would need:

- strong theoretical, content, and pedagogical knowledge;
- ability to collect and analyse data;
- excellent communication and relationship skills;
- to be reflective thinkers and practitioners themselves;
- to be able to mentor, model, provide feedback, challenge, and model reflective thinking;
- to understand and be able to challenge ways in which practices and ideology may disempower the interests of children and families; and
- to practise effective pedagogy themselves.

Organisation of the service

Features within the service may act as constraints or support participants in implementing pedagogic change and processes of data collection, analysis, and collaborative discussion.

Staffing levels and group size

Staffing and group size were presented as major issues in a number of the studies, impacting on the ability of teachers/educators to provide a differentiated curriculum. Staffing levels and group size are critical organisational features that may support or hinder the ability of teachers/educators to respond to diversity. Teachers in one of Carr et al.'s (2000) kindergarten case studies found it impossible to follow and document dispositions and interests as they developed for each individual child because of the large group sizes (44 children in each session) and staffing levels (3 teachers). Young-Loveridge et al. (1995) found that the poor teacher: child ratios in the 4 Waikato kindergartens in their study made it difficult for the teachers to spend time in complex or extended interactions. Poor staffing levels were highlighted as barriers to self-review in McLachlan Smith's evaluation of a professional development programme using *The Quality Journey*. The professional development adviser in the Early Childhood Development (2001) professional development programme for Berhampore Kindergarten teachers on work with children from Non English Speaking Backgrounds observed that these children were less able to participate at big group times. The group was divided into three. In addition to providing conditions to enable teachers to work with more NESB children, these conditions seemed to make it easier for people other than the teachers to contribute, with parents contributing to teaching and learning and a child translating for another child.

Swedish staff taking part in the professional development aimed at improving the mediation of learning experiences (Pramling, 1996; Pramling and Palmerus, 1991) worked in centres of much

smaller sizes (14 in two centres, and 16 in the third) and substantially better staffing (4 teachers/educators in the smaller centres and 5 in the larger). In addition, the Swedish staff re-organised the programme so that staff could interact continuously with individual children. Good ratios and small group sizes provide conditions for staff to interact closely and responsively with all children, to provide a differentiated curriculum and to work collaboratively with families and others. While re-organisation of large group sessions can help, the low level staffing standards set in New Zealand's early childhood regulations means that services that do not go beyond these minimum standards do not have optimal conditions to support their delivery of a differentiated curriculum.

Tools and support to assist with data collection, analysis, evaluation and planning

A central feature of effective professional development is the collection, analysis and use of data from within the practitioner's own setting. A range of data collection tools were described in the professional development programmes, many of which were developed by participants. Carr et al.'s (2000, pp. 55–56) summary of the characteristics of the most valuable tools for self-evaluation in her case studies is helpful, i.e. that tools generated reflective discussion and challenged assumptions, included early discussion of criteria, did not put staff down, included peer observations in an atmosphere of trust, could be translated into a chart that offered an accessible and easily read evaluation, and reflected the interests of staff and/or parents.

Many of the effective tools throughout the programmes used observations linked to criteria, simple parental surveys, and staff discussion linked to criteria (e.g., Carr et al., 2000; Mould, 1998; Blenkin & Kelly, 1997). While access to technological tools is not necessary for data collection, use of video and audio-recordings for example revealed powerful insights in some professional development programmes (e.g., Jordan, 1999; Pramling, 1996; Palmerus and Pramling, 1991; Blenkin and Kelly, 1997).

At a practical level, access to tools and support to assist with analysis, planning and documentation means:

- Physical conditions and materials to enable documentation and discussion of the nature and purpose of teaching and learning. These could include materials for making and keeping observations and records, tools such as cameras, audio-tape recorders, video-tape recorders, scanners, photocopiers, computers and an adult work environment that provides space and tables of adequate size and height to lay out documentation.
- Access to professional advisers who are knowledgeable and able to support data collection, analysis, evaluation and planning.
- A research community that engages with teachers in useful discussion of research and thinking.

Conditions within the early childhood centre to support effective pedagogy

If early childhood education centres are to be learning communities for teachers as well as children, parents, and others, there need to be opportunities within the work environment for reflection, experimentation, documentation, and planning. This means:

- centre management who value and support ongoing professional development;
- teachers/educators who place a high priority on their professional growth;
- teachers/educators having time and effective opportunities during the working week for reflection and discussion;
- meaningful professional development provided by professional development advisers and researchers.

Further Investigation

This synthesis has shown a number of areas where evidence is lacking or meagre, and which warrant further investigation. Research that generates more evidence about professional development linked to outcomes for children and to stronger relationships between settings would be valuable. There is little evidence about professional development in some services in New Zealand, and professional development and work with some age groups. Staffing features impact on professional development and there are areas that warrant further investigation.

Linkages to outcomes for children

- There is very little evidence on professional development linked to outcomes for children within the strands and goals of Te Whäriki. Only three studies of two programmes provided such evidence. One of these, a Swedish study, (Pramling, 1996) demonstrated change in child initiated communication, and transcendence by the child (expanding or going beyond the here and now). The other, the UK Effective Early Learning project (Mould, 1998, Ramsden, 1997) demonstrated change in child involvement. Other studies examined professional development linked to specific learning areas, but literacy, mathematical understanding and scientific understanding were the only learning areas in which evidence of the impact of professional development was found. Evidence on professional development linked to Te Whäriki outcomes is a key area in which research would be valuable.
- Only one study (Phillips, McNaughton, & MacDonald, 2002b) followed teachers and children beyond the timeframe of the professional development programme. That one study showed that some changes in outcomes for children were still evident one year later. There is generally no clear evidence on the extent to which changes associated with professional development are enduring, or the features that support sustained change. Longitudinal research of teachers and children to provide evidence of the conditions under which effective pedagogy and outcomes for children are sustained, following professional development is recommended.
- There is limited evidence about Pasifika pedagogy and content knowledge – this knowledge base could be expanded and used to inform professional development approaches in the Pasifika sector. Mara (personal communication) has suggested that the Ministry of Education provide resources for Pasifika early childhood organisations which provide early childhood education to meet and document their pedagogies. This would assist in the establishment of professional development priorities.

Linkages between settings

- While some evidence is available about professional development approaches to strengthening partnerships between home and early childhood setting, further investigation of such approaches, including partnerships with extended family members, where they play a key role in children's lives, would be useful.
- Professional development aimed at strengthening partnerships between primary and early childhood teachers, including ways to build primary teachers' understanding of Te Whäriki is an unexplored area of research, which warrants investigation.
- Professional development aimed at strengthening linkages with community organisations, including health and welfare organisations is another unexplored area where research evidence would be valuable.

Structural features

- Further investigation of processes that work well for participants in professional development programmes from services where there are a mix of qualified and unqualified staff would be useful. Such investigation could examine how to provide a differentiated programme to challenge and engage all participants and enable better qualified, skilled or knowledgeable teachers/educators to mentor others.

Service features

- There are gaps in evidence for specific services and teachers/educators working with specific age groups.

  One gap in evidence is about effective professional development for educators in home-based care settings. Kontos (1992) found only 20 family day care programmes published in accessible data bases, monographs or journals, although another two unpublished programmes had an evaluation component. Most professional development programmes were group sessions combined with home visiting, with training for a year or less usually once or twice a month. Topics were health/safety/nutrition/, child development, guidance or behaviour management, working with parents and business practices. The most consistent result of training was caregiver satisfaction with the training, with slight evidence of changes in knowledge/attitudes regarding children or childcare and in overall quality. Kontos noted:

  > *The typical methodology of these studies makes it nearly impossible to attribute change to training, or to determine relative effectiveness of training. There is an overwhelming need for well-designed studies of the effects of training on family day care providers – studies that consider a variety of outcomes (Kontos, 1992, p.145).*

  Other areas requiring further investigation are professional development programmes for teachers/educators in köhanga reo, Pasifika services and for teachers/educators working with toddlers and babies, and with children with special needs.

Research accessibility

A final recommendation is for measures to make useful research evidence more accessible to practitioners. Access to research evidence and information on workable approaches to building investigation and analysis into pedagogical practice, and working in partnership with researchers and professional development advisers would provide teachers/educators with a valuable resource. Establishment of a central clearing house for people engaged in action research in early childhood settings could help disseminate ideas and approaches.

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APPENDIX I

Letter to professional development providers and researchers

31 May 2002

«First» «Last»
«Title»
«Add1»
«Add2»
«City»

Dear «First»

Research evidence about professional development for early childhood educators

The New Zealand Council for Educational Research is currently working on a project to bring together and analyse research evidence about professional development for teachers/educators in the early childhood sector. We are doing this work (termed a "best evidence synthesis") under contract to the Ministry of Education, who want to base their thinking about policy questions on the synthesis. It is therefore a good and important opportunity for us to help shape policy on the future of New Zealand's professional development.

You are a person who has expertise and knowledge of this area and we are asking for your help in locating research evidence for the synthesis.

Our focus will be on robust evidence which gives material about the quality of professional development in relation to children's learning, experiences, and outcomes (social and dispositional/attitudinal as well as cognitive), and outcomes for families, with a particular emphasis on children from Mäori, Pasifika, and low socio-economic homes. Outside of New Zealand, we are particularly interested in evidence related to professional development that has an impact on indigenous ethnic groups and minority ethnic groups and children from low socio-economic homes. The evidence could relate to different features of professional development, such as:

- Pedagogues and approaches (e.g., whole centre, individual), methods (e.g., use of video, action research methods, modelling, observation and feedback) and conditions (e.g., working with an external professional development facilitator or critical friend, time to spend as whole staff team or parent group in analysing and evaluating work) that assist educators to extend children's learning and development. In New Zealand settings we are particularly but not exclusively interested in evidence that would fit within the context of Te Whäriki;

- Service features, especially the characteristics of staffing (e.g., qualifications and previous training, mix of staffing) or the parent group (for parent-led services), that relate to the provision, take-up, and use of quality professional development to improve children's learning;
- Policy and work environment features that support professional renewal in relation to the improvement of children's learning;
- Implications for professional development of differences in children's learning styles or needs, particularly arising from their cultural and social contexts.

The research evidence we are seeking could be in a variety of forms, e.g., a single case study, a survey, or an evaluation study. We know there is likely to be some evidence that may not have been formally published but nevertheless provides important material for our consideration, such as theses, internal reports, or publications.

We would be very appreciative if you would send us any evidence that you have or refer us to material that you think would be helpful. We are working under tight timeframes and would like to have the evidence or know it is on the way by 26 June. Please ring me on 0044 4 802 1443 or Pam Cubey on 0044 4 476 9252, or email linda.mitchell@nzcer.org.nz or pam.cubey@paradise.net.nz if you would like to discuss our request or have more information.

We know we are asking you to return information to us very quickly, but think you will appreciate that this work will be an important project for early childhood education policy development within New Zealand.

Kind regards

Linda Mitchell
Senior researcher

Pam Cubey
Researcher

APPENDIX II

Summary table of studies of professional development (following order of appearance in the text)

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
Carr, M, May, H., Podmore, V., Cubey, P., Hatherly, A. and Macartney, B. (2000). *Learning and teaching stories: action research on evaluation in early childhood.* Wellington: New Zealand Council for Educational Research.	Participants not under stress, motivated, had little experience implementing Te Whäriki. Parents, qualified teachers, domestic workers included. 1 playcentre – mainly Päkehä, middle income, under 3. 1 playcentre – mixed age, mainly Päkehä, middle income. 1 kindergarten – over 3, mainly Päkehä, middle/upper income 1 kindergarten – over 3, mainly low income, diverse ethnicity (Samoan, Tongan, Mäori, Indian, Cook Island Mäori, Niuean). 1 childcare centre – mixed age, mainly middle income, Päkehä. 1 childcare centre – mixed age, mainly middle income, Päkehä.	One year. Action research following spiral of observing, reflecting, planning and acting, and using a "child's question". All educators from centre involved. Participatory, collaborative, generated discussion and debate, assisted staff to investigate and change reality. In ethnically diverse kindergarten challenged teachers' preconceptions about lack of richness in children's lives.	Interviews with teachers/educators	Shift in interest from activities to children's questions, from concern for external accountability to pedagogy. Interest in criteria for responsive, reciprocal relationships between learners and people, places and things by investigating and evaluating own conversational styles and interactions, and episodes of peer inclusion and exclusion. Greater reflection, willingness to investigate own pedagogy and practices.	Prior knowledge and confidence influential – highly trained staff better able to implement framework with understanding. Less confident needed more time. Parents needed more time. Outside facilitator especially important for these groups. Staff turnover and sickness slowed process. Involving all participants administratively complex. Notion of doing research a barrier for some at the beginning.
Jordan, B. (1999). Technological tools	Staff in 1 childcare centre and 1 kindergarten.	18 months. Four phases: 1)	Questionnaires in phase three, examples given of	Phase Three: Improvement planning, projects based on	Role of facilitator changed over time – direction to

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
supporting the scaffolding of learning. *New Zealand Research in Early Childhood Education*, (2), pp. 53-56.	3-5 year old children. Ethnicity and income not specified.	familiarisation with microphone and video camera, videotaping of 2 or 3 children in each setting, staff analysis and planning from transcripts. Critical questions asked about scaffolding and beliefs. 2) learning about scaffolding of ideas, co-construction of learning, role of documentation of dialogue. Further analysis and discussion. 3)analysis of parent questionnaires and questions asked about what has changed for parents, staff and children and where to next. 4) (12 months later) monitoring of sustainability.	change in phase four – methods not specified.	analysis of child's dialogues, greater involvement of parents in the programme and children's learning at home, staff researching topics of children's interest to extend knowledge base, use of photos to initiate dialogue, consulting children about plans for extension activities. Phase Four: examples of teachers describing own learning and awareness of need for further information about topics children interested in.	minimal support. Radio microphone, video, computer effective tools in supporting scaffolding (for recording and analysis, for children's use, and to search for information).
Pramling, I. (1996). Upgrading the quality of early childhood education: Sweden. In Klein, P. S. (ed), Early intervention. Cross cultural experiences with a mediational approach. New York: Garland Publishing. Palmerus, K. & Pramling, I. (1991) *Increasing the competence of staff dealing*	Staff in 3 Swedish childcare centres. Children aged 1-4 years. High number of social welfare benefit recipients. Ethnicity not specified.	19 months. One week course covering theories and empirical findings about children's development and information about Swedish pre-school programme. Intervention programme held monthly – video recording of children and staff and analysis in group	Interviews of staff Independent coding of video recordings	Interviews: More consistency staff views about programme for younger children and broader scope for looking at infants' and toddlers' needs. Easier for staff to co-operate. Routine activities used in more stimulating way, education and care better integrated. Staff role more	Criteria used express cultural values (e.g. transcendence valued). Less educated nursery assistants tended to use more mechanical aspects of categories, less able to find our what occupying child's mind. Staff who made most progress had greatest

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
with young children. Fifth Early Childhood Convention, 8-13 September: Dunedin		meetings of all educational staff in relation to mediation categories (teacher-centred and child-centred interventions where an adult mediates between a child's experiences and the surrounding environment).		differentiated from role of parents, able to follow more specific objectives of interaction. More aware of reasons for own behaviour, recognised role as teachers/educators. Changed opinions about needs for education of toddlers. Video beneficial – wider view. Independent coding: Greater involvement of children in interaction with staff at end of project. Increase for all groups in transcendence (expanding or going beyond the here and now).	interest in educational methods. Work with toddlers requires staff to understand children who are not able to communicate verbally – requires knowledge and ability. Some structural re-organisation (smaller groups of children).
Pramling Samuelsson, I., Johansson, E., Davidsson, B. & Fors, B. (2000) Student teachers' pre-school children's questions about life – a phenomenographic approach to learning. *European Early Childhood Education Research*, 8(2), pp. 7-32.	46 pre-service students. Comparison group of 19 students.	Focus on child's life questions. Opportunities for reflection and metacognitive aspects emphasised. Interviews, keeping a diary, working with ethical dilemmas, researchers asking provocative questions were methods used to encourage reflection. Comparison group had traditional university course.		Students in intervention group emphasised importance of finding out child's view and tackling child's questions together. Students in this group aware their roles and questions are a tool to help children develop thinking and understand the world around them.	
Timperley, & Robinson, V. (2001). Achieving school	Primary school teachers in 4 primary schools in	Analysis of data to test assumptions – School 1)		Shifts in deficit assumptions for schools 1,	Required discrepant data, presence of external agent

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
improvement through challenging and changing teachers' schema. *Journal of Educational Change*, 22, pp. 281-300.	Mangere and Otara. New entrants followed over 1st year of school.	skill level assessment, School 2) parent education meetings, School 3) data on letter identification, School 4) none. Group reflection, including professional development adviser. Alternative teaching practice modelled.		2, and 3. School 4 failed to test alternative pedagogy – did not fit with teachers' current schemas.	to assist with data collection and interpretation, availability of information on alternative practices.
Mould, C. (1998). The influence of researcher - teacher collaboration on the effectiveness of the early learning of four year olds in schools in England. *European Early Childhood Research*, 6(1), pp. 19-35.	Reception class teachers in UK 4 year olds in the reception classes.	11 months. Discussion and analysis of data from observations of children and teacher. Research articles and literature supplied.	Observations of adult engagement and child involvement. Interviews with teachers and parents.	Rises in child involvement and adult engagement. Link between teachers' levels of engagement and child involvement, and parents taking active role and child involvement.	11 month time frame
Ramsden, F. (1997). The impact of the Effective Early Learning "Quality Evaluation and Development Process upon a voluntary sector playgroup. *European Early Childhood Education Research*, 5 (2), pp. 7-32	Supervisor, assistant and 3 paid helpers in UK rural playgroup. 12 three and four year olds in playgroup.	8 months. Similar methods to Mould (1998) above.	As above.	Rises in engagement and child involvement.	
McLachlan-Smith,C., Grey, A. & Haynes, D. (2001). *The quality journey: preliminary results from 72 early childhood centres*. New Zealand Association for Research in Education Conference, 6-9 December, Christchurch.	Staff and teachers/educators in 28 childcare centres, 23 kindergartens, 13 playcentres, 5 Montessori pre-schools, 4 crèches, 1 Samoan centre in 5 areas of NZ.	4 full day workshops on design of self-review projects. Project support person visited each centre twice in a year to assist with design and implementation of self-review.	Focus group interviews and questionnaires with participants at start, mid-point and end of project.	Participants felt better prepared to implement self-review, knowledge of topics enhanced, thought interactions with children improved, better skills communicating with staff and parents. Practical tools useful.	Barriers were inadequate staffing levels, bringing staff on board who did not attend, resistance to self-review from some playcentre parents, motivating untrained staff, cultural issues.

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
Depree, L. and Hayward, K. (2001). *Creating changes to culture. Using the Quality Journey resource as a reflective tool*. New Zealand Association for Research in Education Annual Conference, December, Dunedin.	Staff in 3 Christchurch childcare centres. Children in the 3 centres.	Whole team professional development over 15 hours per centre, 2 cluster meetings.	Evaluations by participants.	Positive changes to awareness of teaching practices, challenges to lift standards, teams working together, enhanced problem-solving. Some changes to structures identified through data gathering.	
Blenkin, G. and Hutchin, V. (1998). Action research, child observations and professional development: some evidence from a research project. *Early years*, 19 (1), pp. 62–75. Blenkin, G. M. and Kelly, A. V. (1997). *Principles into practice in early childhood education*. London: Paul Chapman Publishing Ltd.	Teachers/educators in 67 UK early childhood settings.	18 months and 30 months. Action research involving practitioner and researcher partnership. Focus found, evidence collected, reflection and evaluation, more evidence etc. Practitioners making observations and journals of thought processes for analysis.	Case studies.	Need to use observation as a diagnostic tool and to be analytic in assessing quality of what children do. Observations used to develop thinking and practice.	Motivation necessary. Trained staff in most successful settings. Teachers/educators in control. Hard to work with groups of practitioners with different needs.
Langley, J. (1997). *The development of an in-service training programme to enable kindergarten teachers to better manage the behaviour of young children with behaviour disorders.* Thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy. University of	Teachers in 4 Christchurch kindergartens. 2 children with severe behaviour problems from each kindergarten.	4 ½ weeks. Screening of children, training to record positive responses to appropriate child behaviour and negative responses to inappropriate child behaviour in workshops in which theoretical and practical activities undertaken. Practice and support package – teachers	Interviews with teachers, observation of target children's behaviour.	In kindergartens where a criterion of acceptable behaviour was set, and teachers were given feedback, higher positive teacher responses to appropriate behaviour was found. 5 out of 8 children's behaviour moved from disruptive to within the normal range for children of that age.	

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
Canterbury. Christchurch.		required to set goals, monitor and respond to target children's behaviour. Feedback given.			
Phillips, G., McNaughton, S., & MacDonald, S. (2002). *Picking up the pace. Effective literacy interventions for accelerated progress over the transition into decile 1 schools*. Wellington: Ministry of Education.	37 teachers from 8 kindergartens, 5 Pasifika early childhood centres, 1 school-based centre, 1 church-based centre and 73 primary teachers from 12 decile 1 primary schools in Otara and Mangere. Children in these primary schools.	20 weeks. Professional development sessions of 2 hours every 2 weeks over 2 terms. Some joint early childhood and primary teacher sessions held. Early childhood professional development covered ideas about literacy, ideas about teaching, learning and development, goals for children's development. Then specific activities: reading to children, guiding reading, telling and retelling stories. Examination of teachers' own activities.	Assessment on measures of literacy and language of children on entry to school, at 5.6 years and at age 6.0 years. Teacher interviews.	Children with early childhood intervention had significantly higher scores on measures at age 5.0 than new entrants that attended an early childhood service, but had no intervention. At 5.6 only somewhat higher scores, and at age 6.0 higher scores only on concepts about print. Some advantages for children whose early childhood and primary teachers both undertook the professional development. Teachers' expectations raised. Better understanding of literacy development and role of teacher.	Used empowering approach. Drew on rich text activities.
Raban, B., Ure, C., & Smith, G. (1999). *Accelerating literacy progress for new school entrants: the pre-school literacy project (Stage 3) in Victoria.* Paper presented at the Australia/New Zealand AARE Conference, Melbourne.	Teachers in 40 pre-schools (PLP centres) in New South Wales 347 children after one year at school whose teachers had taken part in the programme. 613 students whose teachers had not taken part.	One 2-hour cluster meeting and 3-4 additional meetings over 1 year. Initial meeting examined current understandings of literacy development. Teachers chose a goal. Journal provided for teachers' use. Networking where teachers	Postal survey and interviews of teachers' understanding of literacy development. Survey after professional development of understanding. Assessment of students on range of literacy measures.	Children who attended a PLP centre had significantly higher scores on oral language, concepts of print, phonemic awareness, writing own words, word tests, and running records of level texts. Not different on letter identification.	All teachers involved. Teachers complained about large groups and ratios (3: 30 children) and minimal administrative support.

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
Ure, C., & Raban, B. (2001). Teachers' beliefs and understandings of literacy in the pre-school: Pre-school Literacy Project Stage 1. *Contemporary Issues in Early Childhood, 2*(2), 157-168.		discussed examples of own practice and new ideas on resources. Day conference for all teachers.			
Neuman, S. B. (1999). Books make a difference: A study of access to literacy. *Reading Research Quarterly, 34*(3), 286-311.	Staff in 50 childcare centres in Pennsylvania. 35 treatment and 31 control group 3 and 4 year olds in 50 centres in economically disadvantaged communities, who were followed into school after 6 months.	1st programme - 5 books per child given to centres. Monthly workshops in local libraries by pre-school specialists and some co-ordination with the centre. 2nd programme - More context-specific training and support model of workshops in centres, on developmentally appropriate practice, read aloud techniques, stretching ideas to make meaning, ways to enhance access to books.	Standardised assessments before programme and after programme in language and literacy measures. Photographic accounts of areas in each centre where there were books, observations of child: teacher interactions, collection schedules, teacher survey.	Children in programme scored higher on 4 of 6 assessment measures.	Environments and low training levels fall below NZ standards.
McNaughton, S., Wolfgramm, E., & Afeaki, V. (1996). *Reading strategies for Tongan pre-schoolers.* Auckland: Auckland Uniservices Ltd.	7 Tongan families and children from Tongan early childhood centre.	Shared ideas about types of reading, showed video-taped demonstration and commentary, discussed practical ideas. Parents to respond to children's initiations.	Child observation.	Children's engagement in non-immediate talk. Parents added to their styles.	Some new story books in Tongan supplied and limited help given for transport and telephone communication. Programmes need adequate resourcing.
Sauvao, L. (1995). *Parents' involvement in A'oga Amata: actions speak louder than words.* Paper	Samoan and Tokelauan parents in playgroup.	Action cycle of lesson demonstrations on shared reading, story telling and song teaching, parents	Written and verbal evaluations.		Fear of parents and teachers hindered participation.

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
presented at the New Zealand Association for Research in Education Conference, 7-10 December, Palmerston North.		undertaking tasks and being observed, researcher feedback.			
Esler, A. N. (2001). *Children at the centre: child development through evidence based practice.* Unpublished Doctor of Philosophy, University of Minnesota.	Teachers in 3 pre-school classrooms in Mid West US (control group) and 3 in intervention group. 3, 4, and 5-year-olds.	Written material and 3 2-hour sessions covering language practices, social skills practices, book reading and behaviour management. 2 booster sessions 6 weeks later.	Assessment of children on measures of language pro-social behaviour and problem behaviour, and assessment of centre environment.	Many dropped out of the study, but language scores higher and teachers' behaviour ratings better in intervention group.	High attrition rate,
de Vocht, L. (2001). *Effect of adult engagement on the involvement of young children in book reading activities at an urban playcentre*. Unpublished MEd study, Canterbury University, Christchurch.	Supervisors in rural playcentre. 4 children studied.	2 training sessions with playcentre supervisors on adult interactive strategies during story reading.	Counting of children's comments.	Rise in mean number of statements made by children in book reading. Supervisors more aware of relating book reading to life experiences, leaving more pauses and discussing book with child.	Need to work with all parents in a playcentre setting.
Moriarty, K. (2001). Enhancing emergent writing in playcentre sessions: an action research report. Unpublished BEd study, Massey University.	24 playcentre parents.	Surveyed parents on knowledge of writing, views of what playcentre did to encourage writing, interest in finding out more. Discussed survey findings and agreed on actions to enhance writing opportunities. Writing workshop and	Evaluation meeting, review survey, observations of emergent writing.	Opportunities for children to experience emergent writing improved, adults better informed about how writing develops and what they could do to enhance writing, equipment accessed and stored appropriately, adults more confident in providing	Action research worked well in playcentre setting

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
		actions followed up.		stimulating writing environment.	
Young-Loveridge, J., Carr, M., & Peters, S. (1995). *Enhancing the mathematics of four-year-olds. The EMI-4s study*. Hamilton: University of Waikato.	Teachers in 4 Waikato kindergartens. 154 4-year olds.	Teachers in 3 kindergartens met weekly to discuss mathematical ideas and obtain resources. Teachers developed activities to give greater focus to mathematics in everyday routines and activities and explore mathematical opportunities, constructed resources and worked with children. Teachers in fourth kindergarten continued the usual programme.	Interviewed children. Observed 4 expert and 4 novice children in each kindergarten. Interviewed parents.	In 2 kindergartens where teachers took part in professional development teachers enhanced mathematics of children. In 3rd kindergarten teachers regarded mathematics as planned activity rather than ongoing.	High teacher child ratio made it hard for teachers to spend time in complex interactions with children.
Watters, J. J., Diezmann, C. M., Grieshaber, S. J., & Davis, J. M. (2001). Enhancing science education for young children: a contemporary initiative. *Australian Journal of Early Childhood*, *26*(2), 1-7.	700 early childhood teachers in Queensland.	Orientation phase – background , curriculum policy and science initiatives discussed. Resource kit video and manual displayed. Engagement phase – Group exploration and discussion on science topics (45 minutes on each topic). Explored resources related to topic and suggested ways to extend children's thinking. Reflection phase – strategies reviewed and concerns discussed.	Survey completed by 192 participants.	Teachers adopted child-centred approach in beliefs about teaching science, personal understanding enhanced and aligned with pedagogic understanding, understanding of learning in science developed, gained knowledge of classroom strategies to teach science, valued investigative methods, developed strategies to organise and manage resources.	Need for background information on topics, information on implementing, planning and assessing lessons sought, information on how to teach science in multi-ages sought, need to integrate science with other areas.

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
Fleer, M. (1996b). Fusing the boundaries between home and child care to support children's scientific learning. *Research in Science Education, 26*(2), 143-154.	Teachers in an Australian childcare centre 10 children and families. Children aged 2.8 years – 4.10 years.	5 units with scientific focus on solids, liquids and gases; materials and their properties; evaporation and condensation; dissolving; and decay, rusting and burning. Constructivist approach – find out understandings, children asking questions and investigating answers. Teachers encouraged shared understanding through newsletter to parents, activity book with home-based activities, direct sharing.	Implementation of programme videotaped. Parents interviewed before and after programme.	Children ask more scientific questions at home than prior to study, but not at centre. Parents appreciated communication with teachers. Parents' view of science changed from elitist view to everyday perspective. View of own role also changed – parents could be active in development of scientific thinking.	Need to examine teaching context since children did not ask scientific questions at home.
Ball, J. (Undated). *First Nations Partnership Programs Generative Curriculum Model*. Victoria, British Columbia: University of Victoria. Ball, J., Leo, C., & Pierre, M. (2001). From the inside out. A profile of Mount Currie First Nation Aboriginal Child and Youth Care Programh. *CCCF, Spring*, 25-27. Ball, J., & Pence, A. (2001). Training in First Nations communities: Five "secrets" of success. *CCCF, Spring*, 19-23.	Seven First Nations community groups, including instructors, elders, resource people working with teacher trainees in collaboration with University of Victoria.	Ongoing. Locally recruited instructors, elders, resource people met weekly with trainees to discuss and model traditional customs, language and values related to children's stages of development. Theoretical and curriculum approaches examined. Focus on strengths not deficits.	2 year evaluation – Questions from partner communities, data from collaborators, examination of impact of programme	Good fit between attitudes and skills of trainees and goals needs and circumstances of children. Wellbeing of families strengthened. Higher rate of post-secondary qualifications and career development among teacher trainees.	

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
Early Childhood Development. (2001). Berhampore Kindergarten. Developing appropriate teaching practices to meet the needs of diverse ethnic communities attending early childhood services. Lower Hutt: Early Childhood Development.	Teachers at Berhampore Kindergarten. Many children from NESB homes.	Action research – data collection, needs analysis in relation to meeting needs of culturally diverse group of children, development of action plan, reflective evaluation and discussion, development of new plan etc.	Staff evaluations.	Changed opportunities for children's learning: Staff developed vocabulary lists in Somali, Syrrian and other languages, more use was made of lists, staff divided groups to make smaller more intensive work on scaffolding language acquisition possible, children translating for other children, parents teaching songs and language.	Groups restructured to enable more intensive work.
Whalley, M. (1997). *Working with parents*. London: Hodder and Stoughton. Whalley, M., & the Pen Green Centre Team. (2001). *Involving parents in their children's learning*. London: Paul Chapman.	Parents and staff at Pen Green Centre for Under 5s and their families Children at Pen Green Centre	Pen Green loop of parent-led observations and feedback to staff and staff-led observations and feedback to parents. Use made of observations and video, diary entries. Weekly curriculum and individual planning uses information.		Illustrates action research spiral being used in ongoing way with parents and staff.	
European Commission Network on Childcare and other Measures to reconcile Employment and Family Responsibilities. (1995). *Fathers, nurseries and childcare*. Brussels: European Commission.	Mothers and fathers from 6 towns in Emilia Romagna, Italy. Staff and parents at Pen Green Centre for Under 5s and their families.	Emilia Romagna – training to explore social and family changes, fatherhood and motherhood, legislation, appropriate group work techniques. Pen Green – analysis of reasons for low involvement of fathers, staff training on gender		Emilia Romagna - Educational work with children to challenge gender issues. Pen Green - 2/3rds of fathers at Pen Green took their children to the centre or collected them, 1/3rd took part in settling child when child started. Change	

Study	Participants	Characteristics of Professional Development	Research Methods	Linkages	Issues
		issues and action research to work with men.		from 10 years previously where very few fathers involved. Visibility of men heightened. Issues of gender discussed. National conference on men as carers held - 40 men attended.	