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28/6/2016_#2

Fostering Effective Early Learning (FEEL) Study

Early Start Research Institute, University of Wollongong

A review of the current international evidence considering quality in early childhood education and care programmes – in delivery, pedagogy and child outcomes

A study funded by the NSW Department of Education

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2017

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Glossary

CALD	Culturally and Linguistically Diverse
CIS	Caregiver Interaction Scale
CLASS	Classroom Assessment Scoring System (scale)
COAG	Coalition of Australian Governments
DEEWR	Department of Education, Employment and Workplace Relations (former Australian Government Department)
E4Kids	Effective Early Educational Experiences study (Australia)
ECEC	Early Childhood Education and Care
ECERS	Early Childhood Environmental Rating Scale
EPPE	The Effective Provision of Preschool Education study (England)
EPPSE	The Effective Pre-School, Primary and Secondary Education study
ERS	Environmental Rating Scales
EYFS	Early Years Foundation Stage (England)
EYLF	Early Years Learning Framework
FCCERS	Family Child Care Environment Rating Scale
FEEL	Fostering Effective Early Learning
HLE	Home Learning Environment (early)
ITERS	Infant/Toddler Environmental Rating Scale
NICHD	National Institute of Child Health and Development (United States)
NQF	National Quality Framework (Australia)
NQS	National Quality Standard (Australia)
OECD	Organisation of Economic Cooperation and Development
PD	Professional Development
SACERS	School-age Care Environment Rating Scale
SEIFA	Socio-Economic Indexes for Area (Australia)
SST	Sustained Shared Thinking
SSTEW	Sustained Shared Thinking and Emotional Wellbeing (scale)
WWH	Who, What, How

Executive Summary

There is a large body of international academic research literature which examines the relationship between (i) early childhood education and care (ECEC) and (ii) children's developmental and learning outcomes.

Decades of sustained international research by many different research groups demonstrate that children who attend ECEC are likely to experience better behavioural and learning outcomes than those who do not attend. The research findings are, of course, not always consistent, and are more robust over shorter measurement periods. Nevertheless, major national surveys (e.g. OECD, 2011) and ambitious longitudinal research projects (e.g. the EPPSE study, Sylva et al., 2014) document that the benefits of ECEC attendance last into adolescence. There is now a consensus that, relative to no ECEC, attendance at ECEC is likely to confer a benefit on children (Melhuish et al., 2015).

While the documented benefits of ECEC are wide-ranging and (within a typical cross-section of children) of small or modest magnitude, a number of important findings have emerged recently which modify the potential significance of ECEC as a vehicle for fostering children's development and learning.

First, the potential benefits of ECEC are clearer and greater for children from disadvantaged backgrounds. Indeed, the potentially positive impact of ECEC appears to increase with the gradient of social disadvantage (Melhuish et al., 2015).

Second, the potential benefits of ECEC depend on the quality of the service provision and, to a lesser extent, on the amount of time spent by the child in such a service. Although the importance of high quality ECEC for fostering children's development and learning extends across the gradient of social disadvantage, it is particularly significant for children from highly disadvantaged backgrounds (Siraj-Blatchford, 2004; Tayler and Siraj, 2014).

> "The positive impact of childcare quality on various aspects of children's development is one of the most consistent findings in developmental science."

Following the research literature, there is now general recognition in major research surveys, international guidelines (e.g. OECD, 2012; Zaslow et al., 2010) and national policy frameworks (COAG, 2009) that the developmental, learning and social benefits associated with ECEC cannot be assumed to follow unless the service provision is of sufficient quality. Melhuish et al (2015; p50) explain that 'the positive impact of childcare quality on various aspects of children's development is one of the most consistent findings in developmental science'.

ECEC provides a universal, cost-effective platform through which governments can introduce changes designed to support children's educational attainment and their long-term social participation and health - but only if the ECEC provision is of good to excellent quality.

On current evidence, policy changes seeking to increase parental workforce participation by improving access to ECEC or by providing more flexible attendance hours (i.e. changing the intensity of the provision) will not necessarily result in improved child outcomes - unless they are accompanied by a commitment to improving and maintaining service quality.

Currently, there is a good consensus in the ECEC research literature on a number of important issues. For example, it is widely accepted that (i) high quality ECEC yields multiple developmental and learning benefits for all children, with particular benefits for disadvantaged children; and (ii) the elements of quality ECEC, in terms of both structure and process, can be measured using reliable, valid, and internationally recognised environmental rating scales (see Siraj and Kingston, 2015).

There is, however, relatively impoverished evidence of adequate experimental rigour showing how ECEC educator practices can be modified through professional development (PD) to bring about sufficient quality improvement so that positive changes in child outcomes can be observed (Zaslow el al., 2010). The Fostering Effective Early Learning (FEEL) study is a response to this.

This review of the research literature draws on current evidence to identify the key elements of educator practice and PD needed for sustained, transformational changes in ECEC quality. Through the research that does focus on the effectiveness of PD, this review concludes that:

i. While the structural quality elements of ECEC (e.g. staff qualifications and child-teacher ratios) do contribute to educator practice, there needs to be a sustained focus on process quality for PD to bring about changes in the quality of child/teacher interactions (and in the development and implementation of high quality

curricula) by encouraging educator behaviour that provides supportive, thoughtful and gently challenging interactions with and between children across a variety of instructional domains.

ii. Current and future PD effectiveness research should employ standardised, widely recognised tools (environmental rating scales) to assess process quality across a range of instructional and content areas. These tools are also important for informing PD, for reflecting on practice, and for ensuring that core, evidence-based, instructional domains are addressed in practice.

iii. To demonstrate that PD interventions lead to effective practice, it is important to show that positive changes in process quality can be linked to improvements in child behaviour, development and learning outcomes as well as staff development.

iv. There is emerging consensus that educators need to have a strong grounding in child development research and theory to respond appropriately to children's learning and individual, cultural and developmental needs. Formal qualifications, such as degrees in ECEC offered by universities, should provide a firmer knowledge of child development than shorter or vocationally focused qualifications. PD on high quality curriculum can, to some extent, mediate the link between qualifications and quality practice, and knowledge of culturally sensitive child development should be incorporated in PD designed to improve process quality.

v. Existing evidence indicates that formal qualifications play a strong role in preparing the workforce to deliver high quality ECEC, while also exerting important influences on educational leadership. Qualifications, however, should be complemented by PD that has clear structure, enhances specific teaching and learning strategies, and fills gaps in educator practice and learning. More research is needed to examine how qualifications and PD can best complement one another.

vi. A skilled workforce is needed to deliver a high quality curriculum in a way that involves pedagogical approaches which are sensitive, engaging and include challenging interactions with children (i.e. process quality). To bring about these transformational changes, educators should have a strong knowledge base and sense of purpose - which implies giving value to their work, continued learning and professionalism.

vii. Many current early years educators may not be familiar with key content knowledge, child development theory or the kind of high quality interactions that children require for their learning. It is, therefore, essential to model these high quality interactions for them, to provide them with rich examples and illustrations for learning and reflection, and to work face-to-face in the delivery of PD to establish their trust and rapport. All early years educators need to become familiar with high quality practice to be enabled to establish it in their own planning and individual and collaborative practice. Further, relationship building through PD should also extend educators' skill sets to work more effectively in partnership with other staff and families - an essential feature of high quality ECEC.

viii. Changing practice requires on-going support, as well as opportunities to try and refine new skills - ideally in a conceptually aligned community of ECEC educators with strong leadership for learning.

ix. High quality ECEC requires sensitivity to, and understanding of, the different needs experienced by individual children, families and communities. It is necessary to be aware of specific issues that arise in relation to culturally and linguistically diverse (CALD) communities, and also to understand how to recognise and meet the needs of vulnerable children and children with specific needs or disabilities.

These conclusions represent a set of empirically grounded findings, principles and understandings that have informed the development of the FEEL PD intervention programme commissioned by the NSW Department of Education, and delivered by researchers at the Early Start Research Institute, University of Wollongong.

The findings of the FEEL study should make a further valuable contribution to the empirical foundation informing best practice to ensure that all children can flourish and achieve their full potential in ECEC.

Introduction

In 2015, after competitive tender, the New South Wales Department of Education awarded the Early Start Research Institute at the University of Wollongong a grant to study the impact of an evidence based professional development (PD) programme called 'Leadership for Learning'. This innovative study is currently working with 90 early childhood settings across NSW in the year before school entry (with an Early Childhood Teacher (ECT) in both preschool and long day care). Half the centres - the 'intervention group' - are participating in the PD programme, and all 90 have agreed to pre and post ratings of environmental quality and child assessments to study the PD's impact. The 45 centres not participating in the PD - the 'control group' - will receive the PD after the study has finished.

The Fostering Effective Early Learning (FEEL) study was designed: (i) to improve knowledge, skills and attitudes in 'early childhood education and care' (ECEC) of those educators who take part in the intervention element of the study project (with the ultimate aim of impacting positively on children's outcomes); and (ii) to add to the knowledge base informing and establishing which elements of PD make most difference.

To outline the evidence underpinning the FEEL study, this document reviews (i) the international research that identifies those aspects of pedagogy and practice which enhance children's outcomes most efficiently; and (ii) the research which establishes the most effective methods of ensuring improvement in centre-based ECEC provision. Improving the quality of ECEC is an essential element in reaching the goal of achieving more equitable child outcomes.

This review contains three sections. The first two sections focus on two of the main questions that relate to the early childhood sector (e.g. Rebello Britto et al., 2013). These are: (i) 'relative to no ECEC, what impact does ECEC have on children's outcomes?' - this is often called the 'first generation' question; and, (ii) 'how can ECEC be improved to support children's outcomes?' - this is usually identified as the 'second generation' question.

This review's third section is aligned to the 'second generation' question, and looks specifically at the key elements of PD which have been found to be effective in changing practitioner practice and supporting children's developmental outcomes.

Improving the quality of ECEC is an essential element in reaching the goal of achieving more equitable child outcomes. The NSW Government, like many policy makers in developed countries, has considered the growing body of evidence which highlights the vital role ECEC plays in both (i) promoting the cognitive and socio-emotional development of young children, and (ii) mitigating social inequalities through reducing poverty, increasing intergenerational social mobility, and improving social and economic development for society as a whole (OECD, 2012; 2015; Melhuish et al., 2015).

> "Improving the quality of ECEC is an essential element in reaching the goal of achieving more equitable child outcomes."

The fundamental importance of increased access to high quality ECEC was a significant driver in the introduction of the National Quality Framework (NQF) in 2012 which saw greater unification across state and territory-based educational systems and the implementation of a national learning framework, the Early Years Learning Framework (EYLF, DEEWR, 2009), and a new assessment and rating system, the National Quality Standards (NQS) (COAG, 2009) (see ACECQA, 2016).

'The Australian Government's agenda for early childhood education and care (ECEC) focuses on providing Australian families with high-quality, accessible and affordable integrated ECEC. The agenda has a strong emphasis on connecting with schools to ensure all Australian children are fully prepared for learning and life.' (Department of Employment Education and Workplace Relations – DEEWR, 2011, p.1).

While these initiatives recognise the significant role of early childhood professionals in enhancing child outcomes, success depends largely on the capacity of educators to engage with new approaches to pedagogy and practice and apply this effectively within their service (Irvine and Price, 2014).

Part One

Relative to no ECEC, what impact does ECEC have on children's outcomes?

1.1 Quality and ECEC

The national and international evidence for the impact of high quality ECEC is robust and compelling. Both the Organisation for Economic Co-operation and Development's (OECD) education survey and the Programme for International Student Assessment (PISA), show consistently the value of investment in ECEC. In nearly all OECD countries, those 15 year olds who had attended pre-school provision for one year out-performed those who had not. Even after controlling for socio-economic status, one year's attendance at pre-school was associated with an improved test score of 33 points (OECD, 2011).

'PISA research also shows that the relationship between pre-primary attendance and performance tends to be stronger in school systems with longer duration pre-primary education, smaller child-to-teacher ratios in pre-primary education, and higher public expenditure per child at the pre-primary level' (OECD, 2015, p. 328)

There are several key international large-scale longitudinal studies, for example, (i) the Effective Pre-school, Primary and Secondary Education (EPPSE) project (Sylva et al., 2014) which followed >3,000 children in England, (ii) the English-based Families, Children and Child Care (FCCC) study (Sylva et al., 2007) of >1,200 children, and (iii) the United States NICHD Study of Early Child Care (NICHD 1999), which included observations of >600 ECEC settings. These major longitudinal studies all show that both attendance at, and the quality of, ECEC matter.

These studies found that children who had attended pre-schools had higher cognitive and socio-behavioural outcomes at primary school entry than those who had not (Sylva et al., 2004). Follow-up studies found that positive pre-school effects were still apparent at the end of primary school (Sylva et al., 2008; Melhuish et al., 2008a). Further, attendance at higher quality pre-schools continued to predict higher achievements in mathematics, science and socio-behavioural outcomes at 14 years of age (Sylva et al., 2012) and at age 16 in their GCSE results (Sylva et al., 2014).

These international studies show that aspects of children's childcare history, including the quality of care they received, in combination with family factors, predict children's achievement and adjustment in the year before school, in Kindergarten (first year at school), and beyond. Furthermore, the quality of children's relationships with carers and teachers in their early 'school' experiences predict positive teacher-child relationships and more pro-social behaviour in kindergarten. These children are also more likely to say that they enjoy attending school.

> "Furthermore, the quality of children's relationships with carers and teachers in their early 'school' experiences predict positive teacher-child relationships and more pro- social behaviour in kindergarten. These children are also more likely to say that they enjoy attending school."

Recent findings emerging from the Longitudinal Study of Australian Children (LSAC, 2013) mirror patterns reported within EPPSE (Sylva et al., 2011) and CCC (Bowes et al., 2009), with higher quality relationships at age 2-3 years predicting greater task attentiveness and emotional regulation in the first few years of formal schooling (Gialamas et al., 2014). However, with the exception of the LSAC (Australian Government Department of Family and Community Services, 2004) and the Child Care Choices (CCC) Extension Study (Bowes et al., 2009), most studies conducted within Australia have been relatively short-term. Therefore, longer-term effects relevant to the Australian context need to be extrapolated from international studies, in particular those conducted in countries with similar demographics, cultures and ECEC practices as Australia.

Broadly speaking, international insights are receiving preliminary support from the Australian E4Kids study, which does take a longitudinal approach and is early in the data-reporting phase. This suggests that such interpretation of international studies is likely to predict similar trends in Australia. It is also noteworthy that the Child Care Choices Longitudinal Extension study (Bowes et al., 2009), which examined non-parental and familial care, and early school experiences of children in urban and rural New South Wales over a seven year period, has further emphasised the immediate and the long-term influence of ECEC on children's adjustment and school engagement.

Importantly, the benefits of ECEC are most marked for children from poorer and disadvantaged backgrounds (Siraj-Blatchford, 2004; Ruhm and Waldfogel, 2012). Typically, such children enter ECEC with lower scores on measures of socio-emotional and cognitive development than their more advantaged peers. There are a number of possible reasons for this, including the differences in learning opportunities and cultural capital available. For example, children from more affluent homes may have a greater variety and frequency of quality educational experiences (trips to parks, libraries, museums and places of interest, etc.), and also may have greater access to books, educational toys and more exposure to language with a richer and larger vocabulary.

For example, Fernald et al's.,(2013) research found:

'significant disparities in vocabulary and language processing efficiency…already evident at 18 months between infants from higher and lower socio-economic (SES) families, and by 24 months there was a 6-month gap between SES groups in processing skills critical to language development.' (p.234)

Finally, children from more advantaged home backgrounds may also experience more consistent parenting and less exposure to the effects of stressful life events, such as those due to financial pressures and/or cramped and unhealthy living conditions.

As a result of these early disparities, children from disadvantaged home backgrounds often experience on-going difficulties in their education, resulting in an increasing 'achievement gap' compared to their more advantaged peers. They enter school with fewer academic skills and often show increasing cognitive delay in later school years (Stipek and Ryan, 1997).

Fifty years of research have convinced academics and policy makers that high quality ECEC provision benefits 'at risk' children from impoverished environments and helps prepare them for school entry. A number of high profile USA studies, including the Abecedarian project (Campbell et al., 2002; Karoly et al., 2005), the Perry Pre-school Project (Barnett, 2008; Pianta et al., 2009), the Early Training Project (Anderson, 2008 Karoly et al., 2005) and the numerous Head Start projects (Barnett, 2008; Bloom and Weiland, 2015), confirm the advantages of attendance at high quality ECEC provision. They show that the gains include: higher cognitive functioning, academic skills and educational attainment, and better social adjustment; and, as the children grow older and into adulthood, the gains extend to greater likelihood of employment, social integration and reduced criminality.

Many studies have also demonstrated that the early 'home learning environment' (HLE) is a powerful predictor of future educational and career success (Melhuish et al., 2008b). Effective ECEC settings have been found to offer children from disadvantaged backgrounds added advantages both while they were in the setting and also through partnership work with parents to enhance the early and later HLE (Sylva et al., 2004; Siraj and Mayo, 2014). That is, although family characteristics such as mother's education have been shown to have a greater impact on children's outcomes than ECEC factors, the effect of attending ECEC on developmental progress can be greater than the effect of social disadvantage (Geddes et al., 2010).

"Effective ECEC settings have been found to offer children from disadvantaged backgrounds added advantages both while they were in the setting and also through partnership work with parents to enhance the early and later home learning environment."

Unfortunately, the disparity in quality of ECEC provision is a major concern across many countries in the developed world. In the US, for example, much of the government funded, centre-based ECEC provision is described as 'mediocre or worse' (see Haskins and Barnett, 2010). Further, the benefits to children attending such settings are limited. There is even evidence that some low quality ECEC settings may damage children's outcomes and their subsequent prospects (Melhuish, 2004; Melhuish et al., 2015; Gambaro et al., 2014).

Concerns about the quality of ECEC provision, and the potential to narrow the 'achievement gap' between children from advantaged and disadvantaged backgrounds has been a major focus of many national and international studies. Where quality of ECEC is low, findings are disappointing. Pianta et al. (2009) estimated that the 'gap' was currently narrowed only by 5% in US. Interestingly, Pianta and colleagues suggested that this can be increased towards 50% if the centres are supported to provide high quality programme delivery, pedagogy and practice.

Although it is clear that ECEC provision for children at risk can contribute to combating educational disadvantage, the accumulated message of the international studies is that the quality of the ECEC provision is fundamental (Leseman, 2009).

1.2 Policy directions

From a government perspective, investing in ECEC can offer solutions to a number of socio-economic issues, especially for disadvantaged families. Policy changes and research have shown that ECEC has the potential to ameliorate the effects of poverty, and possibly gender inequality, in the short term, and to improve children's future prospects in the long term (Sylva et al., 2004; Siraj and Kingston, 2015). The focus on shorter and longer term aims and their associated costs can, however, be complex - and, on occasion, can even be oppositional.

Nevertheless, Lynch and Vaghul (2015) calculate that the universal pre-kindergarten programme could, by 2050, yield $8.90 in benefits for every one dollar invested - with $304.7 billion total benefits.

One common governmental focus is the offer of ECEC provision which is accessible, flexible and accommodates the working day. This focus is designed to encourage parents, especially mothers, back into the workforce. While it cannot be denied that these are laudable aims, they often come, unfortunately, at the expense of quality (West, 2006).

The publication of the National Quality Standards for early childhood education and care and school age care (COAG, 2009b) is a direct response to the growing evidence of the role quality ECEC plays in shaping child outcomes. It also reflects a shift in focus away from ECEC as enabling parental workforce participation to one which reflects the vision of the Starting Strong II report (OECD, 2006), where early education was seen as a significant investment in the future.

If the ultimate aim of public policy is to promote the well-being of individuals, families, communities, and nations, investment in early childhood education is clearly a highly cost-effective strategy.

'Many studies show that providing better access to, and lowering the cost of high-quality child care, can significantly increase mothers' employment rates and incomes, and this increase in family income can improve children's outcomes.' (Executive Office of the President of the USA, 2014, p. 9)

> "If the ultimate aim of public policy is to promote the well-being of individuals, families, communities, and nations, investment in early childhood education is clearly a highly cost-effective strategy."

Policy designed to enhance the quality of ECEC to improve the life chances of children by preparing them for their future lives (OECD, 2012) is increasingly being recognised as an important focus. More than mere association between ECEC quality and children's outcomes, investing in high quality ECEC supports increased educational attainment, better employment prospects, and improves heath and general well-being - especially for children from disadvantaged backgrounds (Siraj-Blatchford, 2004; UNICEF, 2008; Melhuish et al., 2015). These benefits can also reduce the need for special educational placements and remedial education as children move through school, therefore reducing financial pressures on primary and high schools.

High quality ECEC is also more cost-effective and yields better results than investing in compensatory programmes in later life - such as job training programmes for the unemployed (Heckman, 2006). Further, as greater social equality becomes apparent, it produces multiple positive effects (what economists call 'positive externalities') including better health outcomes for the population, greater social cohesion, lower crime rates and greater levels of productivity and economic competitiveness (Wilkinson and Pickett, 2009 in Cohen and Naumann, 2014).

In the long-term, government investment in high quality ECEC is the most cost-effective direction for generating population-level change in education, health, wealth and anti-social outcomes. Investing in more flexible and longer opening times provision, although cheaper in the short-term, is ineffective and a false economy (Siraj and Kingston, 2015).

Indeed, the OECD 2012 report concludes that:

- Investing in high-quality universal pre-school can generate population-level change on a range of economic and societal issues.
- Investment in high-quality universal pre-school can pay for itself. After only 8 years the benefits exceed the costs.
- By 2050, high-quality universal pre-school has been calculated to yield $8.90 in benefits for every dollar invested, providing $304.7 billion in total benefit.
- High quality universal pre-school can help combat educational disadvantage, but also benefits children from all socio-economic backgrounds.
- Investing in high quality universal pre-school is both an efficacious and cost-effective public policy strategy to accelerate equitable growth.

Part Two

How can ECEC be improved to support children's outcomes?

Increasingly, international evidence suggests that the benefits of ECEC depend on the quality of the experiences and opportunities they offer to young children (Sylva et al, 2004; OECD, 2012, Melhuish et al. 2015). While many similar experiences and opportunities are provided by parents or carers, the growing international trend in using professional education and care, such as that provided by ECEC centres and early admittance to school, has resulted in the ECEC workforce becoming a focus for change and improvement.

This means that the quality of many young children's experiences and opportunities depends on the skills, dispositions and understandings of the adult ECEC workforce (Geddes et al., 2010; Pianta, 2012; OECD, 2012; DfE, 2014). If, therefore, the public policy goal is to support and enhance children's learning and development, supporting the adult's role (especially in relation to how they provide supportive, thoughtful and gently challenging interactions with and between the children) is imperative (Siraj and Kingston, 2015).

One review of effective PD for early years educators concludes:

'There is an increasing recognition that the relationship a child has with a teacher or caregiver that is both sensitive and stimulating is the central and most critical component of quality in early care and education' (Zaslow et al., 2010 p. ix).

> "There is an increasing recognition that the relationship a child has with a teacher or caregiver that is both sensitive and stimulating is the central and most critical component of quality in early care and education."

In light of this, the current section considers how ECEC can be improved to support children's developmental outcomes. It first describes the dimensions and measurement of quality, and then examines what is currently known about the relations between quality, practice and child outcomes. It also considers some of the more robust research studies, and highlights some of the issues that are particularly pertinent to this review - namely, what is known about the relationship between children's outcomes and early childhood education and care.

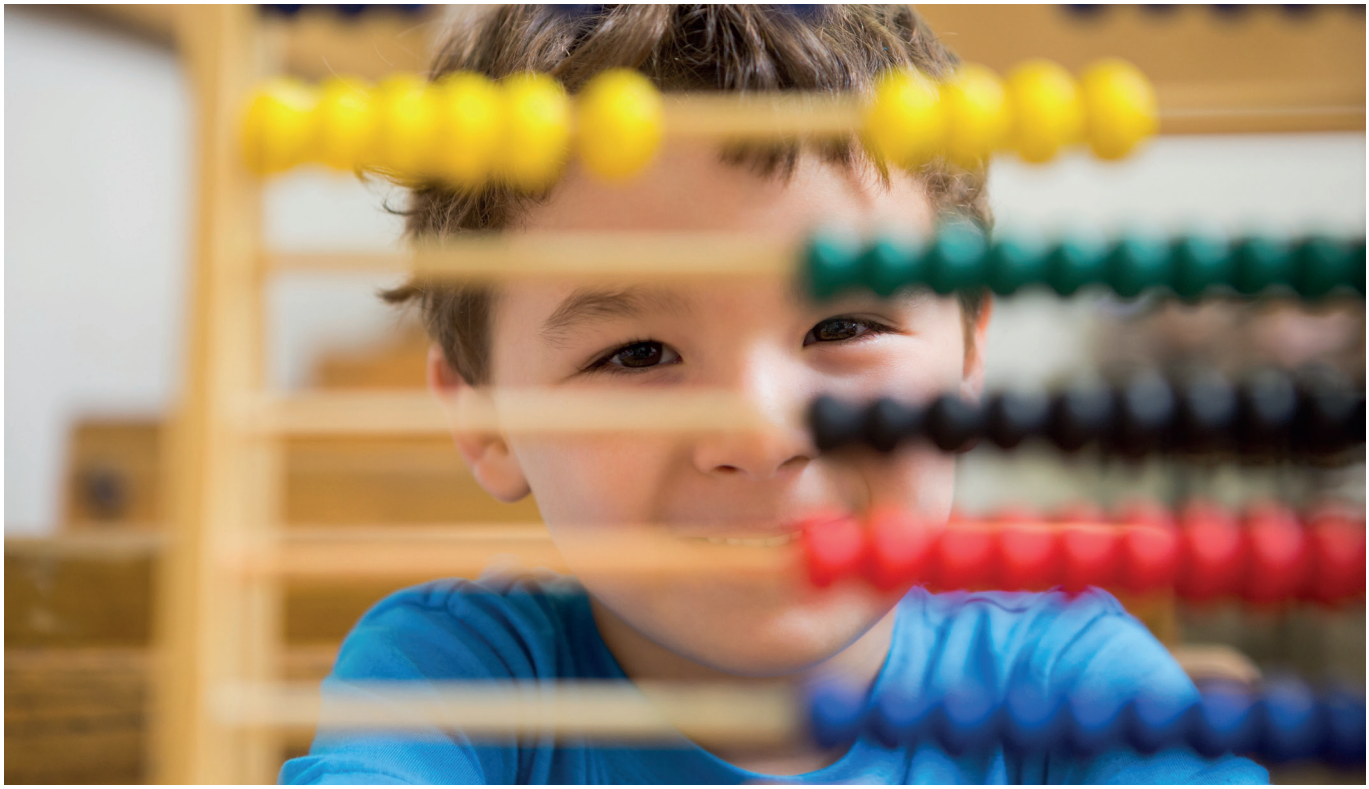
Several earlier reviews deal with these issues in slightly different ways. For example, (i) Zaslow et al. (2010) review the research literature that supports effective PD interventions or approaches for early childhood educators (also see Fukkink and Lont, 2007; National Research Council, 2001); (ii) Siraj and Kingston (2015) survey the evidence and theory on how the skills, qualifications and training of ECEC and out-of-school staff can best improve child learning and development outcomes, while at the same time reducing social inequality; and (iii) Melhuish et al., (2015) review the evidence that justifies the current focus on quality ECEC service provision and the associations, both short- and long-term, between quality and child outcomes in a range of behavioural, developmental and learning domains.

This review does not simply reiterate and update these earlier reviews, although recent developments are highlighted where necessary. Rather, in keeping with the terms of reference (NSW Department of Education Request for Tender DECERA 15-35; in particular, sections 3.3 and 3.5.a) the remaining sections of this review focus on considering how PD should be designed and implemented to best influence practice in a way that sustainably improves both educator practices and child outcomes. Part 3 of this review presents the FEEL study as a response to this current state of affairs in the empirical and professional practice research literature.

2.1 Quality in ECEC

The quality of ECEC is a multidimensional construct, and Siraj and Kingston (2015) describe it encompassing the physical environment, the educational curriculum, staff training and qualifications, child-staff ratios, group sizes, staff turnover and interpersonal relationships. Donabedian (1980) suggests that 'quality' has three key dimensions: 'structure', 'process' and 'outcome'. These key dimensions have been used repeatedly and universally in the field of ECEC to assess the quality of provision (e.g. Phillipsen et al 1997; Dunn, 1994; Holloway and Reichhart-Erickson, 1988; Siraj-Blatchford et al., 2008).

'Structure' refers to 'the resources used in the provision of care, to the more stable aspects of the environment in which the care is produced' (Munton et al., 1995, p14). These include, for example, group size, the adult/child ratio, staff education and training, space and materials. 'Process' refers to 'the activities which constitute provision' (Munton et al., 1995, p14). These include the less stable elements of provision such as staff/child interactions, and are captured by Katz's (2008) question: 'What does it feel like to be a child in this environment?'



This fundamental question can be expressed from the perspective of a child, as follows:

- Do I usually feel welcome rather than captured?
- Do I usually feel that I am someone who belongs rather than someone who is just part of the crowd?
- Do I usually feel accepted, understood and protected by the adults, rather than scolded or neglected by them?
- Am I usually accepted by some of my peers rather than isolated or rejected by them?
- Am I usually addressed seriously and respectfully, rather than as someone who is "precious" or "cute"?
- Do I find most of the activities engaging, absorbing and challenging, rather than just amusing, fun, entertaining or exciting?
- Do I find most of the experiences interesting, rather than frivolous or boring?
- Do I find most of the activities meaningful, rather than mindless or trivial?
- Do I find most of my experiences satisfying, rather than frustrating or confusing?
- Am I usually glad to be here, rather than reluctant to come and eager to leave?

'Outcomes' refer to 'the consequences to health of care provision' (Munton et al.,1995, p4). In the context of ECEC, children's outcomes relate to the cognitive, social and emotional and physical development of the children in the centre. These include aspects of intellectual development such as oral and emergent reading skills, problem solving, the ability to pay attention and concentrate. It also includes socio-emotional development - children's relationships and their ability to share, make friendships and self-regulate their emotions.

Research into ECEC quality examines the relationship between these three key dimensions. Structural variables are easy to identify in a setting as they are tangible and countable. Process variables are more variable across the day, and measurement may include an element of subjectivity - such as making judgments around adult/child interactions. Children's outcomes are normally measured using well-recognised, standardised measurement tools such as the Differential Ability Scales (DAS III) (Elliott, 2007), Peabody Picture Vocabulary Test (PPVT) (Dunn and Dunn, 2007) and the Strengths and Difficulties Questionnaire (SDQ) (Goodman,1997; Melhuish et al., 2008; NESS, 2009) .

> "When measuring structural and process variables, researchers normally use observational rating scales. These allow comparisons to be made across studies and promote greater objectivity of observations."

When measuring structural and process variables, researchers normally use observational rating scales. These allow comparisons to be made across studies and promote greater objectivity of observations. The most widely used scales are linked to the family of early childhood Environment Rating Scales (ERS), some of which are highlighted in Table 1.

Many studies choose ERS as measures because of their international reputation for (i) measuring important aspects of ECEC quality which relate to children's outcomes, (ii) the standardisation processes they have undergone, and (iii) their well established psychometric properties (e.g. reliability and validity).

Table 1: Commonly used Environment Rating Scales when assessing the quality of the provision (Siraj and Kingston, 2015. p30)		
Quality Measurement Tool	**Brief description of quality aspects**	**Provision for which it is designed**
Early Childhood Environment Rating Scale-Revised (ECERS-R) (Harms, Clifford and Cryer, 2004)	Considers structural and some process quality with an emphasis on global aspects of quality. Includes: space and furnishings; personal care routines; language-reasoning; activities; interaction; programme structure; parents and staff.	ECEC for children aged 2½ to 5
Early Childhood Environment Rating Scale-Extended (ECERS-E) (Sylva, Siraj-Blatchford and Taggart, 2010)	Considers the curriculum and educational pedagogy. In the following areas: language and literacy; maths and number; science and the environment; diversity (meeting and planning for the needs of individuals and groups).	ECEC for children aged 3 to 5
Infant/Toddler Environment Rating Scale–Revised (ITERS-R) (Harms, Clifford and Cryer, 1990)	Considers structural and some process quality with an emphasis on global aspects of quality. It covers the same aspects as ECERS-R, but with items relevant to a younger age group.	ECEC for children from birth to 2½.
Family Child Care Environment Rating Scale-Revised (FCCERS-R) (Harms and Clifford, 1996)	Considers structural and some process quality with an emphasis on global aspects of quality. Includes: space and furnishings; basic care; language-reasoning; learning activities; social development; adult needs; supplementary items: provision for exceptional children.	Childminders with children from birth up to and including school age. (Note: items are delineated by age.)
School-age Care Environment Rating Scale (SACERS) (Harms, Vineberg Jacobs and Romano White,1996)	Considers structural and some process quality with an emphasis on global aspects of quality. Includes: space and furnishings; health and safety; activities; interactions; programme structure; staff development; special needs supplementary items.	OSC settings with children aged 5 to 12.
Caregiver Interaction Scale (CIS) (Arnett, 1989)	Considers process quality looking at the interactions between adult and child.Adult interactions are rated typically on dimensions such as: positive interaction, punitiveness, detachment, permissiveness.	ECEC for children from birth to school age.
Classroom Assessment Scoring System (CLASS) (Hamre, Goffin and Kraft-Sayer, 2009)	Considers process quality including: positive climate; negative climate; teacher sensitivity; regard for child perspective; behaviour guidance; facilitation of learning and development; quality of feedback; language modelling.	ECEC and schools with different versions for different age ranges.
Sustained Shared Thinking and Emotional Wellbeing (SSTEW) Scale (Siraj, Kingston and Melhuish, 2015)	Considers aspects of process quality including: building trust, confidence and independence, social and emotional well-being, supporting and extending language and communication, supporting learning and critical thinking, assessing learning and language	ECEC for children aged 2 to 5.

In recent reviews, (Siraj and Kingston, 2015; Melhuish et al., 2015) summarising evidence from numerous international studies conclude that the following characteristics are important for enhancing children's development:

- adult-child interaction which is responsive, affectionate and readily available
- well-trained staff, including teachers who are committed to their work with children
- a developmentally appropriate curriculum with educational content
- ratios and group sizes that allow staff to interact appropriately with children
- supervision that maintains consistency in the quality of care
- staff development that ensures continuity, stability and improving quality
- facilities which are safe, sanitary and accessible to parents
- working with families by sharing educational goals and supporting the HLE

Promoting stronger outcomes for children is complex and requires attention to both process and structural quality. While both process and structural aspects of ECEC quality are important predictors of child outcomes, most scholarly discussion has focused on the relative importance of these dimensions and how they impact upon one another.

Because these aspects are often found to be linked, careful policy development and enactment is needed to ensure that quality moves in the intended direction. In Wales, for example, during the pilot of the Foundation Phase (ages 3-7), adult-child ratios were lowered across all provision for the 3-5 year olds to 1:8 (from 1:8-30 depending on the nature of the provision) yet the quality of interactions and the levels of early literacy both fell (Siraj-Blatchford et al., 2006). This fall in quality was mainly due to the increase in staff levels, where trained graduate teachers, who command a higher salary, were replaced with lower paid, less qualified or unqualified staff. As a result, although the ratio of children to teachers was reduced, so too was the quality of the adult/child interactions.

While adjusting adult-child ratios (a structural variable) can lead to quality improvements, it will not achieve quality enhancement if other structural variables (e.g. staff qualifications and training) suffer which result in less skilful adult-child interactions (process quality).

Of course, no single indicator is likely to be solely predictive of setting quality, though some indicators are more important than others. Research has found that structural variables, such as group size and adult/child ratio, have significant associations with quality (Howes and Smith, 1995).

> "Increasingly, international research shows that the process aspects of adult-child and child-child interactions are the most powerful predictors of impact on child outcomes."

Increasingly, international research shows that the process aspects of adult-child and child-child interactions are the most powerful predictors of impact on child outcomes. Structural quality is now seen as important because the ECEC characteristics it identifies (e.g. adult-child ratios, training and qualifications) can have an impact on process quality. These characteristics together with some of the links between them are explored later.

2.2 Qualifications, PD and other indicators associated with quality

In this section, research examining ECEC staff qualifications and PD are considered in relation to quality. The next section provides further analysis and clarification around relevant aspects of PD with links to the PD 'Leadership for Learning' intervention, used in the FEEL study.

'Qualification' usually refers to the type of formal education delivered by specialist educational institutions. If successful in their studies, learners gain a nationally recognised and standardised award: for example, initial teacher training, such as a four-year Bachelor of Education or a two-year Masters of Teaching; or specific early childhood qualifications offered by Vocational Education and Training, including the Diploma of Early Childhood Education and Care and Certificate III, the recognised entry-level qualification for working in ECEC. The qualifications reflect the role of the educator across a range of ECEC settings and the requirements of the Education and Care Services National Regulations and the NQS (COAG, 2009).

In contrast, staff usually undertake 'PD' after 'qualification/s'. PD normally involves training that exposes staff to new or adapted knowledge, and to strategies they can use to improve their current practice. On occasion, PD may also include some certification; but this may not be recognised nationally or internationally.

When determining quality in ECEC, one of the most important structural measures relates to the educators' educational achievements and qualifications. Clear links have been shown between the level and type of qualifications they possess, the PD they have attended and its quality (Siraj and Kingston, 2015).

'There is a general consensus, supported by research, that well-educated, well-trained professionals are the key factor in providing high-quality ECEC with the most favourable cognitive and social outcomes for children. Research shows that the behaviour of those who work in ECEC matters, and that this is related to their education and training.' (OECD, 2012b, p1)

There is growing evidence about formally recognised qualifications which demonstrates that both the level of the qualifications gained, and the specific nature of the qualification, are important (National Research Council, 2001; Zaslow et al 2010; Rhodes and Huston 2012; OECD, 2012). Studies report that both the levels of qualification which staff have achieved generally, and the relevance (content) of those qualifications to the sector, are associated closely with quality (Blau, 2000; de Kruif et al., 2000; Honig and Hirallal, 1998 cited in Tout et al., 2005; Howes et al., 1992; Phillipsen et al., 1997; Sylva et al., 2004).

While the level of qualification is important, few studies have considered whether a minimum level of qualification is required for effective practice. Nevertheless, the general consensus is that the higher the level of education, the higher the pedagogical quality. This quality is, in turn, associated with better child outcomes (OECD, 2012).

Studies considering staff members who hold degree level qualifications (and many countries now recognise the importance of this level of education) have found graduates to be less authoritarian, less detached and more engaged in positive interaction with the children (Arnett, 1989; Siraj-Blatchford, 2010), and that staff with lower qualifications are associated with less favourable child outcomes (Melhuish, 2004; Siraj-Blatchford, et al 2006; 2010).

The Effective Provision of Pre-school Education (EPPE) project (Sylva et al., 2004) found higher quality provision in those pre-school settings with a qualified graduate teacher on staff. The quality of the learning environment was seen to increase in centres where early years leaders had higher qualifications. Additionally, improved educational outcomes were observed at Key Stage 1 (children 6-7 years of age) when children's pre-school experiences were a combination of care and learning experiences (Sylva et al., 2010). Further, in ECEC centres and schools with a culture of integrated working, a strong, qualified teacher presence provided a pedagogical lead and support for other staff which improved quality (Whalley, 2009, House of Commons, England 130-11:11).

"Qualifications and PD need to have an impact directly on the pedagogy and practice within the setting/classroom, and specifically on the learning opportunities and experiences offered to the children. In particular, early years practitioners need support to develop their competence in communicating and interacting with children in a shared, meaningful and sustainable manner."

Qualifications and PD need to have an impact directly on the pedagogy and practice within the setting/classroom, and specifically on the learning opportunities and experiences offered to the children. In particular, early years practitioners need support to develop their competence in communicating and interacting with children in a shared, meaningful and sustainable manner (Sheridan et al., 2009; Siraj-Blatchford et al., 2003). Siraj-Blatchford et al. (2002), refer to this as sustained, shared thinking (SST) and Katz (2008), refers to this as 'continuous, contingent interactions' with young children. Katz relates this to recent brain research that has shown how neurological connections are made when children engage in extended, meaningful conversations (back and forth exchanges where one person's response is contingent on what the other person says).

Both the content and structure of qualifications and PD appear to make a practical difference in the centre/setting/classroom. With regards to PD, this is explored in more detail later. This debate is informed by some recognised common characteristics of effective educators, for example, a good working knowledge of child development and early childhood pedagogy (Siraj-Blatchford et al., 2006), and by the finding that educators with specific training and qualifications in the field hold less authoritarian beliefs about child-rearing and provide higher quality provision rated as safe and stimulating (Blau, 2000; Philips et al. (2000) cited in Tout et al. (2005); Howes et al., 1992).

With respect to the characteristics of PD that can affect these sorts of changes, Burchinal et al. (2002) looked at three types of PD: in-service workshops, workshops in the community and workshops at professional meetings. They found that PD usually focussed on practice, and supported educators in the implementation of policy within their settings/schools. They also made distinctions between training and formal education, and suggest that a graduate degree with a childcare-related focus is the best predictor of quality.

greatest impact on pedagogy and practice in the setting/ classroom - with PD's focus on classroom practice complementing the theoretical learning gained from an academic qualification. With this in mind, the FEEL study is targeted with studying the year before school in classes with a graduate teacher present.

High staff turnover has long been recognised as a strong indicator of reduced quality in ECEC. Low wages and the low status of early childhood practitioners are major reasons for this high turnover, which in turn has a significant impact on process quality. Research shows that frequent turnover of staff in ECEC settings mitigates against the development of stable, secure attachments with teachers and caregivers. This lack of consistency impacts negatively on children's social, emotional and language development. In addition, high turnover also causes disconnect between home and school – an important relationship that is associated with children's language, self-help and social, motor, adaptive and basic school skills (Marcon, 1999). High staff turnover is also associated with lower quality ECEC services (Whitebrook et al., 2014)

Working conditions also appear to be an important structural indicator. Members of staff who describe their working conditions as 'pleasant' are more likely to engage in caring and stimulating interactions with the children in their care (Huntsman, 2008; Burchinal et al., 2002). Other studies have also highlighted the importance of wages. For example, Whitebrook, Phillips and Howes (2014) and Goelman et al. (2006) show that wages are fundamental to all aspects of quality, including retention, the value placed on the educator's role, commitment to increasing qualifications, access to PD, and so on. The OECD (2012) reinforces this and suggests that the context and conditions in which staff work are strongly related to stable, sensitive and stimulating interactions with children.

The relationships between quality, a well-trained and qualified workforce, structural variables and process quality are not straightforward; and there is the possibility that other variables are contributing to these effects (Siraj and Kingston, 2015). For example, Melhuish (2004) reports that the adult:child ratio combined with staff qualifications produced bigger effects in terms of quality. Also, staff with higher levels of education, training and salary combined with lower levels of staff turnover produced better measures of higher quality care. This illustrates that a setting's quality depends on many structural and process variables.

Yet there is no doubt that staffing is a fundamental factor in the quality of the setting, and higher quality staff has a positive impact on the quality of a setting (Campbell-Barr, 2009). Improving the quality of ECEC and learning outcomes for children requires a highly skilled workforce - one which offers reflective practice, sound decision making and personalised care (Cooke and Lawton, 2008; Siraj and Kingston, 2015). Further to this point, it is important to recognise that the quality of ECEC is minimally affected by the physical environment (i.e. buildings), and that the most important pre-requisite for quality provision is the quality of the educators who work with the children and families (Abbott and Rodger, 1994). According to Fukkink and Lont (2007), there is ample evidence demonstrating that providing qualifications and PD for educators (building capacity) improves children's learning and wellbeing. They say:

'The training of caregivers is a cornerstone for quality in early care. Caregivers with high educational levels provide better personal care...are more sensitive...are more involved with children...and have more knowledge of developmentally appropriate practice...Furthermore, more educated early educators offer richer learning experiences...provide more language stimulation...and stimulate the social and physical skills of children more often than other educators.' (p 294).

2.3 Quality and child outcomes

There have been only a few longitudinal studies looking at the impact of quality on children's outcomes, mainly due to the high cost of the longitudinal studies required to capture such information. Some of the longitudinal studies that have been conducted have considered qualifications and PD alongside many other factors (e.g. adult: child ratio, group size). For example, Burchinal and Cryer, (2003) took structural and process variables into account, including training, and found that measures of ECEC quality were associated positively with cognitive and social development up to school age. Mathers and Sylva (2007) looked at developmental outcomes of children in the UK's Neighbourhood Nurseries Initiative. They found that the presence of a qualified teacher was the strongest predictor of children's behavioural outcomes (e.g. cooperation, conformity and sociability).

Mathers, et al,. (2007) using data from a large longitudinal UK study, the Millennium Cohort Study, found quality (assessed using ECERS-R, ECERS-E and CIS; see Table 1 above) was predicted by staff qualifications, especially when these were sector specific. There was also a positive relationship between qualification and language development, interactions and children's academic progress. The reverse was also true, in that the study also showed that the proportion of unqualified staff had a negative relationship with quality.

Contradictory findings are common, however, for instance, Ackerman-Ross and Khanna (1989) compared 3-year-old children who had attended 'high quality day care' with those who had not. They reported no significant language performance differences between the two groups, suggesting that some effects of childcare can be short-lived.

More recent research, however, has shown that adults with a degree are more responsive to children, and that children cared for by a member of staff with a child-related degree have higher scores on language comprehension (Howes, 1997). The importance of supporting young children's communication and language development in ECEC is well recognised (The Communication Trust, 2015; The Hanen Centre, 2015).

There are also links between quality and social development. For instance, in their research, Holloway and Reichhart-Erikson (1988) considered children's reasoning in social issues, their interaction with peers, and their solitary free-play behaviour. To measure process quality, they used the Early Childhood Observation Instrument (ECOI, Bredekamp, 1985). They found that higher quality settings provide children with more opportunity to engage in focused, solitary free-play, which may well foster the children's development.

Clearly, more research needs to be conducted in this area to identify the most relevant qualifications and PD content for strengthening child outcomes. Overall, however, research shows that there are clear influences on the quality of early childhood learning and subsequent learning outcomes, with an inter-play of many factors. The qualifications of staff appear to influence their interactions with children, their responsiveness and warmth towards children, and, subsequently, the children's social and language development.

> "The qualifications of staff appear to influence their interactions with children, their responsiveness and warmth towards children, and, subsequently, the children's social and language development."

The FEEL project aims to extend the database of knowledge that considers the effect of PD on children's socio-emotional and cognitive developmental outcomes - with the ultimate aim of providing better education and care for future generations.

2.4 Qualifications, PD and effectiveness

Fukkink and Lont (2007) reviewed studies published between 1980-2005 that considered training and PD; and they suggested a need for caution in considering the success of projects. They suggested that results:

'were significantly smaller for settings with no fixed curriculum content, delivery of training at multiple sites....results were also smaller when tests were used which did not align with the content of the training...' (p 294).

They reported that it was educators' ability to create a high-quality pedagogic environment which made the difference for children, not the qualification on its own. The critical element was the way in which staff involved children, stimulated interactions with and between children, and used diverse scaffolding strategies (OECD, 2012).

With this in mind, there appear to be four key questions:

i. Which skills and attributes should effective ECEC educators/staff possess to enhance quality and to support children's learning and development?

ii. What role does the effective educator play within the setting/classroom?

iii. How do current qualifications and PD support staff in developing the identified characteristics of effective educators?

iv. What do current ECEC educators need?

(i) Which skills and attributes should effective ECEC educators/staff possess to enhance quality and support children's learning and development?

While reviewing the literature on important skills and traits of staff in facilitating high quality services and children's outcomes in ECEC, OECD (2012, p146) produced the following list:

- good understanding of child development and learning
- ability to develop children's perspectives
- ability to praise, comfort, question and be responsive to children
- leadership skills, problem solving and development of targeted lesson plans
- good vocabulary and an ability to elicit children's ideas

The REPEY study (Siraj-Blatchford et al., 2003) provides a complementary, more detailed list of educators' characteristics associated with effective practice and better child outcomes:

- views children's cognitive development and social development as complementary, and does not prioritise one over the other
- has strong leadership and long-serving staff (three years plus): this applies even in private day-care settings where staff turnover is normally highest
- provides a strong educational focus with trained teachers working alongside, and supporting, less qualified staff
- provides children with a mixture of practitioner initiated group work and learning through freely chosen play
- provides adult-led interactions which involve 'sustained shared thinking' and open-ended questioning to extend children's thinking
- contains practitioners with good curriculum knowledge and with knowledge and understanding of how children learn
- has strong parental involvement, especially in terms of shared educational aims with parents
- provides both formative feedback to children during activities and regular reporting and discussion with parents about their child's progress
- ensures behaviour policies in which staff support children in rationalising and talking through their conflicts
- provides differentiated learning opportunities which meet the needs of particular individuals and groups of children e.g. bilingual, special educational needs, girls, boys, etc

These lists illustrate the importance of the adult's pedagogical approach. OECD (2012) states that staff qualifications, initial education and continued PD can contribute to enhancing:

'pedagogical quality, which is, ultimately, highly associated with better child outcomes. It is not the qualification per se that has the impact on child outcomes but the ability of better qualified staff members to create a high quality pedagogic environment. Key elements of high quality are the ways in which staff involve children, stimulate interaction within and between children, and use diverse scaffolding strategies' (op cit p143).

> "Staff qualifications, initial education and continued PD can contribute to enhancing pedagogical quality, which is, ultimately, highly associated with better child outcomes."

The REPEY research identified the importance of high quality interactions that support and extend children's thinking (sustained shared thinking - SST). This occurs when two or more individuals 'work together' in an intellectual way to solve a problem, clarify a concept, evaluate an activity, extend a narrative, etc. Both parties must contribute to the thinking, and it must develop and extend the understanding (Siraj-Blatchford et al., 2003)

SST includes the successful support of children's communication, language, thinking and learning. This requires highly skilled staff who are knowledgeable in: children's learning; assessing, monitoring and supporting children's

socio-emotional, linguistic and cognitive development; and ensuring children are safe, stimulated, and ready to learn and think deeply. In order for ECEC educators to possess this knowledge and skills, they require teaching by tutors who are familiar with the concepts, can model them well, and are able to apply theoretical bases to real life practice.

More recently, other international research has endorsed the view that SST is a key aspect of practice if children's learning and development is to be enhanced by attendance at ECEC provision (Sylva et al., 2014; Pianta, 2012, Katz, 2008), and it has become widely acknowledged in many curricula across the world. SST's influence is reflected powerfully in the development of the Australian Early Years Learning Framework (EYLF) (DEEWR and COAG, 2009) and the English Early Years Foundation Stage (EYFS) (Early Education, 2012). Even so, the practices associated with SST are still relatively poor (Siraj-Blatchford et al., 2002; Sylva et al., 2004).

(ii) What role does the effective educator play within the setting/classroom?

Increasingly, the complexity of the adult's working role in ECEC settings is being recognised. Evidence supports a move away from historically inaccurate views of the ECEC workforce; namely, that: (i) the knowledge and skills required by educators are mere common-sense; (ii) mothers can teach young children equally well; (iii) play is simply the work of children, and the adults (mostly women) need only to provide resources for play and supervise children's experiences.

> "Effective educators combine positive relationships with meaningful learning experiences, so that they can integrate explicit instruction with sensitive, warm interaction. They provide responsive, individualised feedback and intentional engagement - while maintaining a setting that is orderly and predictable, but not overly structured or formal."

Effective educators need to be able to engage young children in meaningful activities which promote their conceptual understanding of the world. To achieve this, however, they first must develop positive adult-child relationships (Howes et al, 2008; Pianta et al 2007). These positive relationships provide children with a secure and safe base for exploring the interpersonal and intellectual aspects of ECEC.

Effective educators combine positive relationships with meaningful learning experiences, so that they can integrate explicit instruction with sensitive, warm interaction. They provide responsive, individualised feedback and intentional engagement - while maintaining a setting that is orderly and predictable, but not overly structured or formal (Howes and Tsao, 2013). Because of the huge disparity in the skills of the young children attending ECEC settings, supporting their learning and development is complex and challenging.

The qualifications and PD offered to early childhood practitioners needs to promote and develop educators' understanding of child development and developmentally and culturally appropriate practice for young children. Siraj-Blatchford et al. (2005) shows that the quality of teaching and learning in maintained schools (state run settings where qualified teachers work) is higher than in non-maintained settings (private and voluntary where there are fewer staff with appropriate qualifications). Further, in settings where qualified staff are employed, the teachers are more likely to nurture both children's intellectual development and social-emotional wellbeing.

High quality initial qualifications, and PD in areas of study that are aligned and relevant (such as child development and early education), increase the likelihood of educators successfully enhancing the educational, socio-emotional and health development of children (Sylva et al., 2004; OCED, 2012).

Early childhood practitioners with training in the area of development and care are more able to develop a child's perspective (Sommer et al., 2010), and promote and support learning through play (Pramling-Samuelsson and Asplund-Carlsson, 2008). These practitioners also show problem solving and create developmentally and culturally appropriate learning experiences for children, while simultaneously supporting children's oral and early literacy development via their own improved vocabulary (NIEER, 2004). Educators with higher, specialised education are also more likely to interact with children in a more positive way – offering praise, encouragement and comfort, or asking questions which show interest in the child's activity (Howes et al., 2003). Even so, as Hyson et al (2009) remarks, there is no guarantee that any level of specialised education and training will lead to greater effectiveness.

While highly qualified staff really do make a difference to the quality of a setting, it has not been seen as necessary, nor realistic in many countries, for all staff to possess high qualifications. OECD (2012) suggests that practitioners with lower levels of education or less qualifications benefit by observing and working alongside more qualified members of staff.

(iii) How do current qualifications and PD support educators in developing identified characteristics of effective educators?

Howes and Tsao (2013) suggest that the lack of an established pathway for early childhood educators' preparation is a major issue contributing to the international dearth of effective educators in this sector. There is little standardisation of content across degrees (both initial teacher training and specific ECEC degrees); as a result, they can be weak predictors of effective practice (Early et al., 2007). Additionally, the lack of correspondence between formal

qualifications and effective practice is linked to young children spending relatively small proportions of their days in learning experiences - and an even smaller proportion of their time working with an educator (Chien et al., 2010; Phillips et al., 2009).

> "Understanding how young children develop and learn, and using this knowledge to inform practice, appears to be a necessary skill for educators."

While ECEC specific qualifications have, generally, been found to support quality practice, there has not, to date, been a comprehensive analysis of how the content of such qualifications match the characteristics of effective educators. Understanding how young children develop and learn, and using this knowledge to inform practice, appears to be a necessary skill for educators. Siraj and Kingston (2015), however, while looking at workforce and qualifications in Scotland, concluded that qualifications vary in their focus, such as child development, even when comparing qualifications developed specifically for ECEC. This is important because this inconsistency of content is not unique to Scotland; it reflects an on-going debate within the ECEC profession in many parts of the world including Australia.

While examining the place of theory in PD, Stephen (2012), suggests that theoretical understandings of children's learning and development are often marginalised, and are often restricted to initial qualifications. As a result, many practitioners are unable to answer 'why' questions in relation to their practice and, therefore, often act more as 'care providers' than as 'teachers' (Stephen and Brown 2004). While this is not unusual, and similar findings have been reported internationally (for example Pramling-Samuelsson and Fleer, 2009), it is concerning for the public policy goal of enhancing the achievements of all children. Further, moving away from the notion of mere 'care providers' is especially important for children living in areas of disadvantage and/or with learning difficulties. The PD for the FEEL study draws upon and discusses relevant theoretical underpinnings.

Stephen (2012, p 236) makes a strong argument to move educators forward from their current over-reliance 'on consensual notions of practice and tacit understandings' of theory in ECEC. Stephen maintains that this leaves educators unable to defend their practices, incapable of considering alternatives or engaging in critical thinking, and ill-equipped to evaluate 'policy change and challenge, resulting in naive or inadequately conceptualised amendments to practitioners' methods'. Stephen further suggests that this inadequate knowledge of the theories, histories, constructions and beliefs underlying ECEC practice leads to educators unable to respond appropriately to new ideas, or to develop new ideas, in a way that undermines professionalism in the workforce.

Over the last 20 years, the understanding of, and potential uses for, knowledge of child development theory has been contested; in particular, by those who follow a post-modernist perspective and question the usefulness of the concept of quality (e.g. Dahlberg et al., 1999). Some ECEC academic staff leading qualification courses have considered the idea of student ECEC educators learning about child development to be unethical. This view is possibly due to the way that child development norms have been used to test, label and even exclude some children from the mainstream because of their results. This is, however, not the way that child development is now typically used - particularly in research considering effective practice and enhanced children's learning and development in ECEC.

When the study of child development is given sufficient time and is linked to practice, teachers in training learn the strengths and contradictions among the theories (e.g. Bandura, Rogoff, Piaget, Vygotsky and Bronfenbrenner). For example, students and trainees can be encouraged to view children's development holistically and to draw upon aspects of research and theory that support the learning and development of each individual child at that specific time and context.

Child development theories also promote educators' understanding of, and empathy for, children, as children's experiences, reactions and views of the world are seen to differ from their own. They support educators in recognising the uniqueness of each child and how their individuality, culture and context can influence their responses and actions. Finding individual children who do not follow the 'typical patterns' of development described in child development theories can be as informative as finding children who do.

In summary, it is important to recognise that specialised qualifications and PD do not, on their own, guarantee greater practitioner effectiveness (Hyson et al., 2009). This is due to: the varied content; the quality of the trainers/tutors; their views about what should be taught; and the way programmes of study are structured. Elliott (2006) reports a need for good initial staff preparation and greater consistency across initial professional preparation programmes. There is also a need for high quality ongoing PD, as well-trained

educators/teachers should ensure that the effects of their initial qualification and studies do not 'fade away' (Fukkink and Lont, 2007).

(iv) What do current ECEC educators need?

Continuing PD fills the gaps in knowledge and skills that are often apparent in practice after initial training, and it keeps educators up-to-date with research into best practice. This is particularly important in ECEC, where there is a growing body of research into 'what works' and some still unresolved debates. The recent shift in emphasis to a more developmental perspective illustrates this (OECD, 2012).

Before discussing the current literature on effective PD, it is important to consider what is known to be lacking and what is needed in today's ECEC workforce at an international level, as this is likely to have resonance within Australia and NSW.

Unfortunately, large-scale studies of ECEC suggest that too few educators have the necessary skills and knowledge to plan and provide optimal learning and social-emotional support for young children's intellectual and emotional development (Howes et al., 2008). Knowledge and understanding of child development can be inadequate or flawed due to the way it is presented in some initial teacher education courses and some PD sessions.

Early childhood practitioners also show a lack of understanding for, and confidence in, supporting young children's emergent science, mathematics and numeracy. This is problematic, because much research demonstrates that meaningful instruction in numeracy and science is a strong predictor of future academic success (Duncan et al., 2007). For example:

'Mathematical thinking is cognitively foundational, and children's early knowledge of math strongly predicts their later success in math. More surprising is that preschool mathematics knowledge predicts achievement even into high school. Most surprising is that it also predicts later reading achievement even better than early reading skills. In fact, research shows that doing more mathematics increases oral language abilities, even when measured during the following school year. These include vocabulary, inference, independence, and grammatical complexity. Given the importance of mathematics to academic success in all subjects, all children need a robust knowledge of mathematics in their earliest years.' (ECS, 2013, p. 2)

The importance of good foundations in language development and literacy to support later learning is also well documented (Coghlan, 2009; Sylva et al, 2004). Educators need guidance on supporting aspects of child development including speaking and listening skills, emergent literacy, numeracy and science. They need to be able to link learning to the children's interests, and support children to understand the purpose and function of their learning. They need to know how best to support language, literacy, numeracy, exploration and science, and physical development - through both independent and focused learning activities. They also need guidance on how to organise the environment to provide numerous opportunities for children to practice and apply newly learnt skills at an appropriate level (Siraj and Kingston, 2015).

In addition, ECEC practitioners need to feel confident to teach aspects of literacy, numeracy and science at the appropriate levels and to support parents/carers in developing their children's literacy, numeracy and scientific exploration in the home learning environment (Siraj and Kingston, 2014).

"This recognition has led to the development of PD programmes which include a mixture of the academic skills and knowledge necessary to assess children's interests and achievements, and to inform planning, etc., together with relationship-building between the student on the course and the tutors running them."

Further, researchers such as Raver et al. (2008), are beginning to recognise that the effective adult-child interactions which are expected in effective settings are the interactions in which many educators have never themselves participated - neither as educators, nor as children. This recognition has led to the development of PD programmes which include a mixture of the academic skills and knowledge necessary to assess children's interests and achievements, and to inform planning, etc., together with relationship-building between the student on the course and the tutors running them. Typically, such PD has achieved good results; it involves modelling, providing exemplars of sensitive and responsive interactions, and providing support for challenging behaviour (Erickson and Kurz-Reimer 1999; Toth et al., 2011).

It is challenging to provide models and exemplars of sensitive and responsive interactions; this is because it requires face-to-face teaching, which is generally more expensive. Research comparing PD that focuses on relationship-building with PD that focuses on written elements, or is mostly web-based, demonstrates that the relationship-building approach leads to increased adult-child positive interactions and child development in literacy, language and social and physical behaviour (Downer et al., 2009; Mashburn et al., 2010; Pianta et al., 2008; Archer and Siraj, 2015).

This is why the PD element of the FEEL study starts with short, carefully targeted, face-to-face teaching, and uses blended learning in the later stages of the intervention to support continued motivation and collaboration. Improving the quality of adult-child interactions is a key goal in the PD. Moreover relationship-building between tutors and educators, and between educators themselves, is prioritised in every face-to-face session.

Part Three

Effective PD and the FEEL study

In this document, PD refers to a number of experiences which promote the education, training, and development opportunities for those who already do, or will, work in ECEC. Given this definition, PD applies to a range of activities which attempt to increase the knowledge, skills, and/or attitudes of ECEC educators working with young children and their families/carers. Ultimately, through supporting educators and their practice, the long-term aim of PD is to enhance the children's personal, social, behavioural and cognitive outcomes (Guskey, 2000; 2001). As such, the ultimate measures of PD initiatives are positive changes in these outcomes.

> "PD applies to a range of activities which attempt to increase the knowledge, skills, and/or attitudes of ECEC educators working with young children and their families/carers. Ultimately, through supporting educators and their practice, the long-term aim of PD is to enhance the children's personal, social, behavioural and cognitive outcomes."

The ongoing FEEL study, therefore, gathers data on: (i) changes within the classrooms/settings in terms of the enhanced skills and knowledge of the educators (as measured by ERS during observations of their practice); (ii) changes in the educators' beliefs and attitudes (through questionnaires); and (iii) changes in the children's developmental outcomes (as measured by direct and indirect assessment of children's socio-emotional and cognitive development). This permits a robust evaluation of the FEEL study's first aim: (i) advancing the educators' knowledge, skills, dispositions, and practices - to support them in educating and caring for the children, and in working with their families/carers.

A second aim of the FEEL PD is: (ii) sustaining and enhancing this improvement through promoting a culture of ongoing professional growth for both the individual educators and the educational systems within which they work (Candy, 1991; Johnson and Johnson,1989; Sheridan et al.,2009). Ideally, following the FEEL 'Leadership for Learning' PD, the educators (together with the managers/leaders within their educational context) will take responsibility to direct their own ongoing growth and improvement. They will also continue to collaborate with colleagues, engage with continued study of current and best practice, and reflect and set personal and team action plans - all with the main focus of supporting the learning and development of the children with whom they work.

The form, structure and content of the FEEL PD were developed after recognising the vital contribution that PD can make to enhancing ECEC programmes. It was informed by (i) the relatively new, but growing, international evidence-base relating to effective PD; (ii) a recent pilot study conducted in NSW, Australia; (iii) knowledge of the target ECEC workforce; and (iv) aspects relating to practicality and reach.

While some of the participating educators are graduates, the targeted workforce (in particular all the adults working directly with the children) is diverse. Research shows that large numbers of ECEC educators are relatively poorly-qualified, underpaid working-class women, who have received minimal training (Vincent and Braun, 2010).

Currently across Australia, governments, professional organisations and individual services are investing significantly in PD, but with little or no systematic monitoring of the quality of the options on offer (Hadley et al, 2015), or indeed the quality of those consultants delivering the PD. In contrast, the FEEL study is different, and includes robust measures of evaluating the PD at the child, educator and classroom levels.

3.1 Defining PD

This section summarises and amalgamates some of the more recent, relevant studies involving PD. The resulting analysis is designed to support understandings of (i) a definition of PD and the process of change that educators (and settings) need to undergo for PD to succeed; (ii) common conceptual frameworks, together with an outline of the conceptual framework chosen to support understandings within the FEEL study; and, (iii) aspects of PD commonly seen as important to its effectiveness. These are organised into three 'domains' which have been designed to support the development and later analysis of the FEEL 'Leadership for Learning' PD.

McMillan et al. (2016) report on the 'what' of PD and suggest that there are various definitions of PD: these range from those looking at 'quality, competence and accountability' (Sturrock and Lennie, 2009 p 12) to those addressing broader issues of 'lifelong learning' (Lammintakanen and Kivinen, 2012) including aspects of both professional and personal learning. Kennedy (2007) differentiates between approaches which stem from the accountability agenda with a focus on professional learning and those which focus on more personal aspects - such as the status and rewards attached to professionalism and/or motivation linked to altruism or self-interest.

Earley and Bubb (2004) suggest that effective PD embraces both personal and professional learning and also all formal and informal interventions that support individuals to improve their practice. Further, they suggest that personal development should interact and complement PD. These should not be separated, as educators could be held accountable and standards could be raised in an environment that promotes both personal and professional learning.

Consideration of the 'who', 'what' and 'how' of PD is typically related to the content, purpose, length and delivery of the PD - including whether they lead to recognised qualifications. They can be categorised according to five types (Zaslow and Martinez-Beck, 2006).

- formal education (e.g. foundation degrees, degrees)
- accreditation (e.g. vocational qualifications and apprenticeships)
- coaching and/or consultative interactions (in setting training usually involving observation and feedback on practice)
- specialised, on-the-job in-service training (e.g. training designed to support specific aspects of practice)
- communities of practice or collegial study groups (e.g. networks or groups of colleagues meeting together with the express aim of sharing and improving practice)

The PD or training intervention in the FEEL study incorporates the last two types, and involves ECEC educators who are already in employment. It includes specialised, on-the-job in-service training and the setting up of collegial study groups with all staff within each setting which is facilitated first through face-to-face sessions and then an online learning platform.

3.2 The PD background

In the rapidly developing field of researching PD in the ECEC context, there is much consideration of its structure, communication, shared frameworks and language (e.g. Zaslow et al., 2010). The National PD Center on Inclusion (NPDCI, 2008) in the US published a definition and framework for PD, which outlined three key components of early childhood PD: (i) the learners (who); (ii) the content (what); and (iii) the instructional methods and approaches (how). This is known as WWH. Others have used WWH as an organising framework when reviewing studies (e.g. Egert and Eckhardt, 2012). WWH was acknowledged and taken into account during the development of the FEEL study, as the 'who', 'what' and 'how' were considered important both to support the development of and to acknowledge some of the challenges for PD studies.

Challenges to PD implementation and evaluation

One well-documented challenge for any study conducted in ECEC is the sheer variety of educators working within it - the 'who'. Educators often have different understandings and experiences, and different qualifications and roles within their schools and settings. Given these differences, they may benefit from different approaches to PD and different content in the PD.

In studies with coaching and mentoring of individual staff, such issues are probably minor and adjustments can be made for individuals. In larger randomised controlled trial (RCT) studies, however, the differences need to be addressed in a different way. The FEEL study advocates team working and collaboration, and includes different styles and processes for learning as one way of supporting learner diversity and allowing educators to develop and change at their own pace.

PD programmes that support change and improvement usually include some 'essential key features' (Dunst et al., 2010; Joyce and Showers, 2002). These relate to the 'what' and 'how' of the NPDCI framework (2008). There is, of course, debate about the number and nature of the key features; e.g. Dunst, 2015; Zaslow et al., 2010, Cordingly et al. (2015) and Timperley et al. (2007), but, given the ethical imperative for improvement within the FEEL study, all the different proposed features or elements of successful PD were identified and considered.

Kingston (in prep) listed these and then grouped them to add some structure (though with some interrelationships which were noted) into three domains: (i) content, (ii) process, and

(iii) affect – and this was used both to inform the FEEL PD and to support the analysis of its impact within the study.

(i) Content

- evidence-based practice including links between theory and practice
- specialist expertise
- high quality interactions which support learning and development
- conceptual understandings and knowledge, dosage and adherence
- assessment and planning
- honing observational skills and observing different practice
- responding to diversity and supporting the home learning environment

(ii) Delivery

- collaboration
- specific teaching and coursework with feedback and/or coaching
- supporting in-class practice
- intensity, duration and attendance
- funding
- critical mass of staff and the involvement of managers/ leaders
- the where and how of delivery
- allowing time to link theory and practice
- individual and/or grouping participants
- lifelong learning

(iii) Affect

- motivation
- confidence
- developing professional relationships
- supporting personal characteristics

The ethical and funding issue (with many studies financed by governments), is another challenge which often forces the focus onto maximum impact in the shortest time and therefore reduces the robustness of experimental design. Many studies do not, for example, include an RCT design or measure the PD's intervention impact on child outcomes. Compromises to designs to ensure cost control often make it difficult to isolate what makes the difference to the educators' skills, knowledge and attitudes. In addition, some compromises increase the complexity of the final analysis.

The robustness and relevance of an RCT design in the FEEL study, including the intervention and control groups, with their comparative child assessments and environmental quality ratings, was thought to be critical to understanding the impact of the PD on child outcomes. The FEEL study also includes continuous evaluation of the PD by the participants. Many existing studies, however, do not evaluate subsequent teacher practice, classroom experience or children's experiences (Linder et al., 2016), as they are expensive and time consuming. If improvement is to follow, it is surely fundamental to examine how PD participants implement new approaches within the classroom. Hindman et al. (2015) suggest that evaluation is valuable throughout PD and can usefully inform its development. The FEEL study includes multi-level evaluation at the class and child outcome level, and considers the educators' views at every new stage.

A lack of rigorous centre selection and assignment protocols can also lead to questions about pre-existing group differences and the generalisability of results. The FEEL study adopted an RCT procedure that paired centres based on stratification variables (e.g., Socio-Economic Indexes for Australia [SEIFA], NQS rating, geography, baseline environmental ratings) and randomly assigned one centre in the pair to the intervention group and the other to the control group. This balances groups on background factors, which may otherwise influence the results. When properly executed, adopting an RCT procedure is the most effective evaluation strategy (Melhuish et al., 2015).

The recent interest in the second generation question, 'how can ECEC be improved to further support children's

outcomes?' actually created the challenge of agreeing the key features of a protocol for considering the question itself. Desimone (2011) suggests that three aspects are necessary to ensure PD does what it is intended to do - increase the educators' knowledge and instruction in ways that enhance children's achievements: there should be (i) a definition of PD; (ii) a conceptual framework, outlining the process and desired outcomes of the PD, so that a judgement can be made in relation to the desired effect; and (iii) an agreement on the core/key features or elements of effective practice.

Desimone also points to the importance of ensuring that the evaluation is robust and mirrors the conceptual framework - capturing the core features or elements of effective PD so that they can be analysed in conjunction with any improvements found.

3.3 Conceptual framework

Several models show how PD works to influence educators and children's outcomes. Desimone (2011) proposes a simple basic model, that has subsequently been elaborated, which suggests that successful PD includes the following sequential steps:

- educators experience PD
- PD increases educators' knowledge and skills and/or changes their attitudes and beliefs
- educators use their knowledge, skills attitudes and beliefs to improve the content of their instruction and/or their approach to pedagogy
- the instructional changes introduced by the educators boost the children's learning.

Dunst (2015, p 312) developed this model and applied it to an ECEC context. He postulates that PD should be evidence-based, that the changes may be at the family and the child level, and that attitudes and beliefs towards the new approaches within the PD change following improvements and changes. He suggests five related steps: (i) evidence-based in-service PD practices lead to (ii) changes in early childhood practitioner (ECP) knowledge and skills, which lead to (iii) ECP adoption and use of evidence-based intervention practices, which lead to (iv) changes and improvements in child and family outcomes – which result in (v) changes in ECP attitudes and beliefs.

Interestingly, Dunst, Guskey (1985) and Bandura (1997) suggest that changes in attitudes and beliefs are contingent upon evidence of change in desired outcomes. While these are neat and linear they do not reflect the inter-relationships between changes in knowledge and skills, adoption of intervention practices and attitudes and beliefs. For some educators, for example, changes in attitudes and beliefs may be necessary before they adopt new approaches.

It seems likely that effective PD, like effective practice in ECEC, is part of a complex system of inter-relationships at a number of different levels - including the classroom, the teacher/educator, whole school/setting, and the social and political context (see Teddlie and Reynolds, 2000; Timperley et al. 2007; Kyriakides et al., 2009).

3.4 Summary and overview of the PD intervention in the FEEL study

The Feel PD Programme was designed to strengthen the quality of intentional and relational pedagogy, and is entitled: 'Leadership for Learning'. Its content and design are evidence based and reflect current thoughts on effective PD for improving child outcomes.

> "The Feel PD Program was designed to strengthen the quality of intentional and relational pedagogy, and is entitled: 'Leadership for Learning'. Its content and design are evidence based and reflect current thoughts on effective professional development for improving child outcomes."

It draws on previous research, patterns of strengths and weaknesses in practice that have been identified nationally and internationally - and on the project's own quality baseline measures (ECERS-E and the SSTEW scale - see Table 1 above) to ensure that the PD meets the needs of the participating educators. In addition, it responds to the educators' needs as they evaluate each phase of the PD - with the final phase incorporating their suggestions and self-identified areas for further development.

While the training focuses on effective practice for all children and draws from these findings, it particularly emphasises the pedagogies and practices known to support the learning and development of children of indigenous descent, children with additional needs and those living in homes situated in areas of disadvantage. Children from Indigenous and Culturally

and Linguistically Diverse (CALD) backgrounds are exposed to higher risk familial and neighbourhood environments resulting in poorer mental health outcomes at school entry than their Australian born, English-speaking peers (Priest, Baxter and Hayes, 2012).

High rates of migration have resulted in a highly multicultural landscape with almost a quarter of Australia's 22 million people born overseas, with nearly 20 per cent of Australians speaking a language other than English at home (ABS, 2013). Given the diversity of cultures and families that make up Australian society, it is vital that educators have the knowledge and skills to work collaboratively with families with different values, cultures, beliefs and languages (Wise, 2007).

The content of the PD, detailed in Table 2, utilises recent observations made within early childhood settings in Australia and the UK, together with baseline measures and some of the consistent findings emerging from the research (both national and international) detailed earlier in this paper.

The PD introduces educators to what constitutes high quality early years pedagogy and curriculum knowledge. It also familiarises the educators with the research, theory, skills and knowledge that underpin the ERS. It provides rich opportunities to observe, discuss, practice and reflect upon important attributes of the effective educator's role, such as: engaging in high quality interactions and sustained shared thinking, developing and extending concepts, and modelling critical and reflective thinking.

The content knowledge discussed during the PD reflects current research, and includes child development and key domains of learning - such as communication, language and self-regulation, knowledge of emergent numeracy, science and exploration. In addition, it covers approaches to assessment and planning, observational links to learning intentions, and instructional techniques and clear progressions in learning over time. It focuses on supporting high quality interactions through explicit intentional teaching: supporting and enhancing children's outcomes which requires planning and direct staff/teacher guidance - together with instructional activities which are sequential and build upon existing skills (Epstein, 2007).

Each PD session includes examples of practice through specially selected high quality DVD clips, discussions about the underlying theoretical models and concepts, and teaching about recent research: this rich mix enables critical reflection and supports possible future improvements. The sessions make links to appropriate frameworks - including the National Quality Standards (NQS) and the EYLF (DEEWR, 2009; COAG, 2009). The PD is also delivered by a team of highly skilled and knowledgeable academics and researchers.

The focus of the sessions follows the most recent understandings of effective practice and, therefore, extends beyond the more general frameworks. Care is given to ensuring that the PD is standardised and informed by research to ensure relevance, comparability of setting experience, and repetition of the sessions at a later time. Evidence-based understandings of how young children learn best, including the notions of holistic learning and extending children's active engagement and participation in activities, are fundamental to each session.

Kingston (in prep) argues that there are three domains of effective PD, each containing elements with strong evidence of potential effectiveness (see above). The PD was designed with these in mind. One element, for example, points to the importance of supporting the collective participation by educators and directors from the same settings. Such joint participation helps to support a professional culture and ensure sustainability of new techniques and skills (see Zaslow et al., 2010). It promotes collaborative working and deeper knowledge about aspects of leadership, change management, quality improvement and self-assessment.

Collaborative working is, therefore, a feature throughout the FEEL PD. Towards the end of the programme, support is given to establishing autonomous, self-sufficient communities of learning to ensure continuous quality improvement. Finally, recognition is given to the complex social environments and multiplicity of family backgrounds and experiences found in many settings.

3.5 The FEEL PD programme structure

The FEEL study PD involves training key staff from the 45 intervention centres in one year to strengthen their skills in 'Leadership for Learning'. The PD was developed to offer key experiences to staff. According to Schulman and Schulman (2007), staff need both 'to know' and to be able 'to do' - while being reflective (learning from experience). The FEEL PD programme is being delivered in three distinct phases:

Phase 1: Intensive PD

This involves two days intensive training in a face-to-face venue. The sessions begin with an overview of research on quality in ECEC contexts, drawing on national and international studies. The sessions introduce research on the role of environmental quality and its impact on child outcomes, key concepts and ideas, and support the educators in identifying areas of personal practice to target for improvement. Training sessions are based on a programme developed from the weaknesses documented during the baseline studies. The package includes learning skills in fostering high quality interactions which support language development, social and cognitive development, self-regulation and working with homes.

Phase 2: Follow-up PD

This consists of five fortnightly, four hour sessions in a face-to-face venue. Effective PD combines curriculum and child development knowledge with practice, and allows time for the educators to use newly learnt knowledge, understandings, approaches, etc. within their settings - and to analyse and reflect upon impact (Hamre et al., 2012).

These sessions allow the educators to try, test and evaluate different aspects of practice - and their new knowledge - during and between sessions. Educators are encouraged to make their own individual adaptations, which support ownership and the sustainability of any changes. Finally, the sessions lead to further improvement and planning for changes in practice and support critical reflection of their own and others' practice.

The sessions include adequate time for reflection and critical analysis, and introduce knowledge and pedagogical content on areas that are not covered in Phase 1.

Table 2. The FEEL PD over all 3 phases covers the following areas:	
Research on quality introducing the need for quality improvement	Educators are provided with an overview of key national and international studies highlighting the significance of quality ECEC for children's short- and long-term development, and for economic growth. They are introduced to the main environmental rating scales and other measures used in research. Educators examine those elements of quality teaching pedagogy and practice which have the greatest impact on children's learning and development. The importance of quality improvement and self-assessment is discussed. Educators are invited to consider improvements that they may make within their settings.
High quality interactions which extend thinking and critical process	High quality interactions or engaging in sustained shared thinking (SST) includes the adult in successfully supporting a child's thinking and learning - which undoubtedly requires a highly skilled and knowledgeable practitioner (Siraj and Asani, 2015). The PD supports the educators in understanding the importance of high quality interactions, allowing them to unpick and consider all the elements that contribute to them. They are also given the opportunity to practice and evaluate interactions within, between and beyond the training. The importance of high quality adult-child interactions is emphasised throughout the content sessions.
Self-regulation	Increasingly, research is pointing to children's self-regulation as key to their success in education (Bodrova and Leong, 2007; Melhuish et al., 2015). Self-regulation is the capacity to control one's impulses, both by stopping doing something (even if one does not want to stop) or starting doing something (even if one does not want to start). It requires a child to think ahead to the possible consequences of their actions or to consider alternative actions that would be more appropriate. Self-regulation is not limited to the socio-emotional domain; it can apply to cognitive behaviours, such as paying attention and remembering. By the end of the pre-school years, well regulated children can wait their turn, resist the temptation to grab a desired object from another child, tidy up after play with little prompting, help another child or adult with a task, and persist with a challenging activity. The PD supports educators in understanding how self-regulation develops, so that they can assess children's achievements. It includes discussions around how this can inform planning to support and enhance practice in relation to self-regulation generally and with individual children.
Language development and literacy	The PD focuses on enhancing language skills and development as these are considered to be fundamental to later learning and thinking. Discussions around aspects of language acquisition include how adults support the development of vocabulary, pragmatics (i.e. functioning) and semantics (i.e. meaning). Assessment of, and planning for, play to enhance language acquisition is a key aspect. Within the remit of literacy, consideration is also given to the teaching of the code-related skills of identifying letter names and letter sounds, phonological awareness and writing.
Mathematical and scientific concept development	The PD includes discussion around the mathematical/scientific ideas that are conveyed through the EYLF and how these may link to theory, including discussions around children's informal understandings of mathematics/ scientific knowledge. Importantly, there are opportunities to discuss children's natural interest in these subject areas and how they may be built upon and developed. Finally, there is some acknowledgement of the educators' own attitudes towards these subject areas, their feelings and confidence in using the appropriate vocabulary and being able to explain and expand upon concepts adequately.
Observation, assessment and planning	Different assessment processes are discussed with the focus on assessment for learning. The skills and principles behind assessment for learning are integral to all aspects of the training. Consideration of transforming the assessments into useful plans for teaching and learning are included.
Working in partnership with parents, supporting home learning environments (HLE)	The importance of working in partnership with parents and supporting the home learning environment is well evidenced and documented (Siraj-Blatchford et al., 2002). The PD explores and discusses building and supporting parental partnerships. Consideration is given to those aspects of the home learning environment known to support learning, and how centres can augment and facilitate these. Particular attention is given to creating effective and inviting educational environments and partnerships with children and families from Aboriginal and Torres Strait Islander backgrounds, as well as children and families from disadvantaged areas and those who are hard to reach.
Leadership and management, including self-assessment and change management	The quality of the leadership within early childhood contexts is known to have important effects on all aspects of children's learning and development (Siraj and Hallet, 2014). Effective leadership is particularly important in times of change, such as during the introduction of new policies and practices. Those involved in change need time for discussion and to ask questions, they need to be able to reflect and find their own solutions. The PD supports the educators in leading any changes they decide to implement; it also supports them in honing their self-assessment processes and managing change. To support the implementation of change, educators are introduced to change- plans, which inform and feed into Quality Improvement Plans (QIP).

Phase 3: Model for sustainability

The high rate of staff turnover is a particular challenge for the early childhood educational context, especially settings with low levels of quality (CCL, 2006; Whitebrook et al., 2014). The long-term impact of PD interventions can be limited if staff leave the centre before implementing the change. This can be prevented significantly through supporting and improving quality education and care, and by PD which embeds 'whole centre change' in combination with models of sustainability. Towards the end of this phase, the participants are invited to migrate to a new self-supported learning platform.

Blended delivery

The FEEL PD programme is unique. It begins with direct face-to-face sessions with high quality presentations and group activity to ensure that relationships are supported between the trainers and educators, and between the educators themselves. In phase 2, the participants are introduced to further evidence based knowledge and practice, and supported in contributing to an online collaborative community of learners. This online learning supports the educators during phases 2 and 3. It also supports the induction of new staff to the FEEL project when that is required. Access to the online supported learning platform is available from phase 2; and, in phase 3, it becomes the main platform for communication, collaboration and further learning.

The online UOW Moodle platform is used, and this includes resources and activities which extend and build on the face-to-face PD. The online activities and resources have been designed to promote engagement and establish an online community of educators. The PD content is housed within modules or 'e-books'. These e-books combine video-streamed content integrated with questions and text; there are also links to activities and an educator discussion forum which can be readily shared with centre staff.

The e-books guide educators through an interactive learning experience that requires self-reflection and connection with other educators. Staff participation and discussions feed into an individual learning portfolio which tracks how their ideas about pedagogy, children, families and communities change with the emergence of new information and concepts.

Promotion of educational pathways

The portfolio of learning across the phases allows staff to complete assessment for specific modules which are then credited toward undergraduate and postgraduate degrees. The PD also provides potential pathways into diploma qualifications.

Early Start, UOW, is in a particularly strong position through its commitment to online and blended delivery at undergraduate and postgraduate level, and through its connections with RTOs such as Early Childhood Training and Resource Centre (ECTARC) and TAFE (Australia's largest provider of vocational education and training).

Participant evaluation

At the completion of each phase, participants are invited to feedback on the content and delivery of the workshops. Questions focus on the perceived benefits, pace and content, and how this has influenced changes in their thinking, knowledge and practice. This feedback informs and shapes both delivery within the project and possible future projects. It will also contribute to some process evaluation as part of the RCT.

Intervention evaluation assessments

The efficacy of the FEEL PD programme is being assessed through: (i) environmental quality ratings; and (ii) child outcomes (i.e. cognitive/academic, self-regulation, social development).

"The efficacy of the FEEL PD programme is being assessed through: (i) environmental quality ratings; and (ii) child outcomes (i.e. cognitive/academic, self-regulation, social development)."

The quality of provision in centres is being measured using the Early Childhood Environment Rating Scale - Extended (ECERS-E) and Sustained Shared Thinking and Emotional Well-being (SSTEW) scale, which use concepts central to developmental psychology, early childhood education, care and pedagogy.

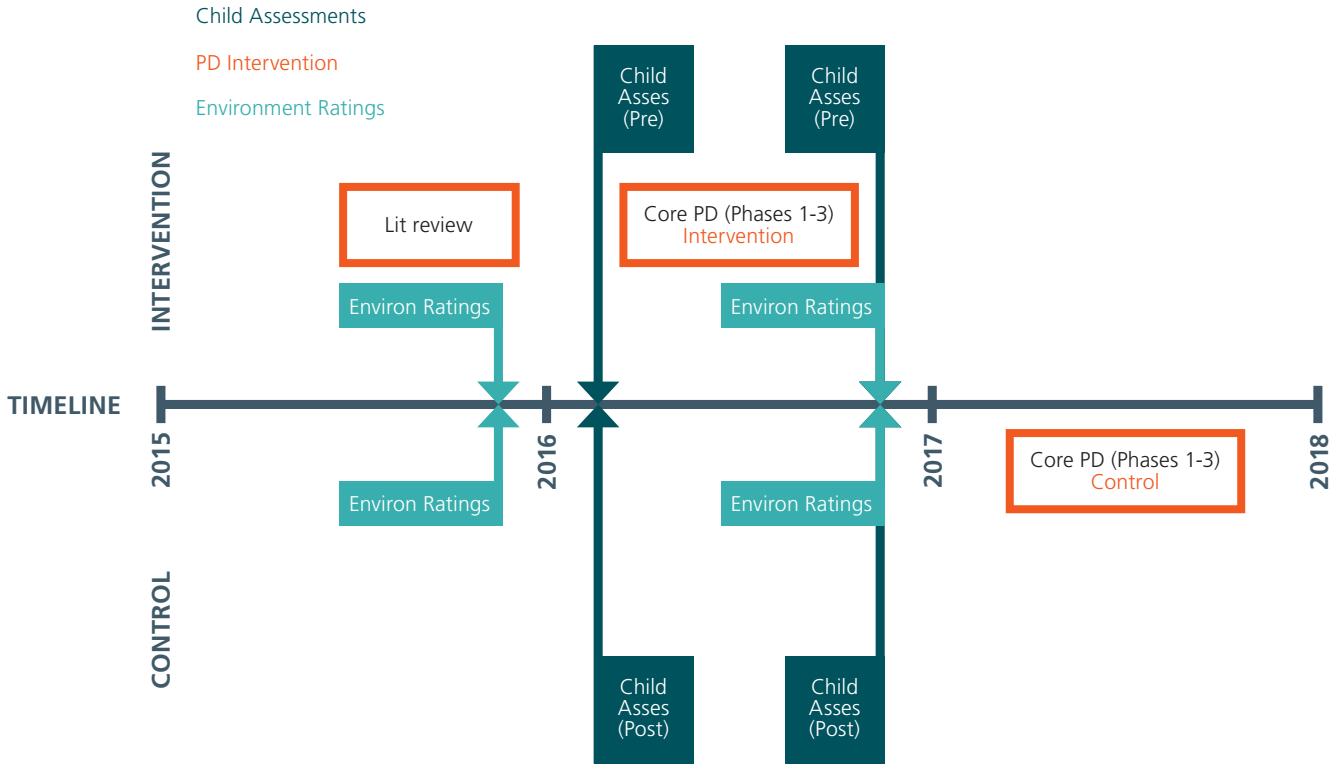
ECERS-E measures quality of the curricula, environment and pedagogy in language and literacy, maths and number, science and environment and diversity (Sylva, Siraj-Blatchford and Taggart, 2010). The SSTEW scale brings together different dimensions of the early childhood education environment in a unique way. It was designed to consider practice that supports children aged 2 to 5 in developing skills in sustained shared thinking and emotional wellbeing (Siraj, Kingston and Melhuish 2015). The scale consists of five subscales: (i) building trust, confidence and independence; (ii) social and

emotional well-being; (iii) supporting and extending language and communication; (iv) supporting learning and critical thinking; and (v) assessing learning and language.

At each participating centre, the director is interviewed for around 45 minutes to compile data on basic characteristics of the centre (e.g. staff turnover, attendance, qualifications, etc.). A battery of child measures was selected for the FEEL study which included outcomes largely, but not exclusively, positioned within the Early Years Learning Framework (e.g. EYLF is weak on certain aspects such as content of curriculum, mathematical and scientific thinking, and learning; yet these areas are important for school readiness and articulation with the Australian curriculum in NSW). In total, these involved 40-50 minutes of direct assessment per child by a trained FEEL study researcher (split into two sessions). The FEEL study also asks for 10 minutes of educator time per child to complete a social-behavioural inventory (i.e, 3.3 hours of educator time per centre, spread across three weeks). In total, the study assesses children's abilities in language, early literacy and numeracy, self-regulation and pro-social development.

Study design

The study utilises a cluster randomised controlled trial design (see diagram below). Ninety centres with an early childhood teacher (ECT; preschool and long day care) were recruited. The study began with baseline environmental quality ratings in late 2015 and baseline child assessments in early 2016. The PD intervention is occurring throughout 2016, beginning early in the year, with front-loaded face-to-face training. Child assessments and environmental ratings will be repeated in late 2016 to evaluate change as a result of the intervention and relative to the control. The control group will receive the PD programme early in 2017, shortly after intervention study has been completed.



3.6 Final comments

Clearly, the FEEL study is testing whether its PD will support staff in adding value to the learning of pre-schoolers in the year before school. The regular evaluations of the PD by participants, as part of FEEL, show what staff perceive as benefits for their own learning and development. These are being documented to identify the benefits in terms of staff understandings of content knowledge, child development and cultural sensitivity, the role of adult intentional and relational pedagogy, and the role they play in leadership for learning and supporting and mediating their children's learning.

If the study is successful, the PD can be manualised to support staff development in other contexts. Issues of fidelity, content, quality and duration would need to be overseen carefully to remain within the principles of the FEEL study - so that any ongoing PD continued to be evidence-based and delivered by knowledgeable, well trained staff.

This literature review shows that there is a good international consensus on a number of important issues within the considerable ECEC research base. For example, it is widely accepted that investment in high quality ECEC produces multiple developmental and learning benefits for all children, with particular benefits for disadvantaged children, and that both the structure and process of ECEC can be measured using reliable, valid, and internationally recognised environmental rating scales.

Showing, however, that a relationship exists between ECEC quality and child outcomes is, quite different to understanding how ECEC services and educator practices can be supported or changed to improve child behaviour, development and learning outcomes.

Any commitment to realising the wide-ranging and socially-just benefits that could entail from public investment in ECEC provision requires a sustained commitment to developing a skilled workforce which understand the needs of children at multiple levels, and can deliver a high quality curriculum to children with differing needs and to support families to do the same.

"Any commitment to realising the wide-ranging and socially-just benefits that could entail from public investment in ECEC provision requires a sustained commitment to developing a skilled workforce which understand the needs of children at multiple levels, and can deliver a high quality curriculum to children with differing needs and to support families to do the same."

The FEEL study is a response to these well established evidence based practices and, it is hoped, will enrich greatly the understanding of how PD can promote transformational professional learning for early years educators.

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