A case study: How is higher-order thinking in young children understood, supported and sustained by educators within three ECEC preschool settings?

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List of Abbreviations

ECEC	Early childhood education and care
EYLF	Early Years Learning Framework
SST	Sustained shared thinking
VT	Visible thinking

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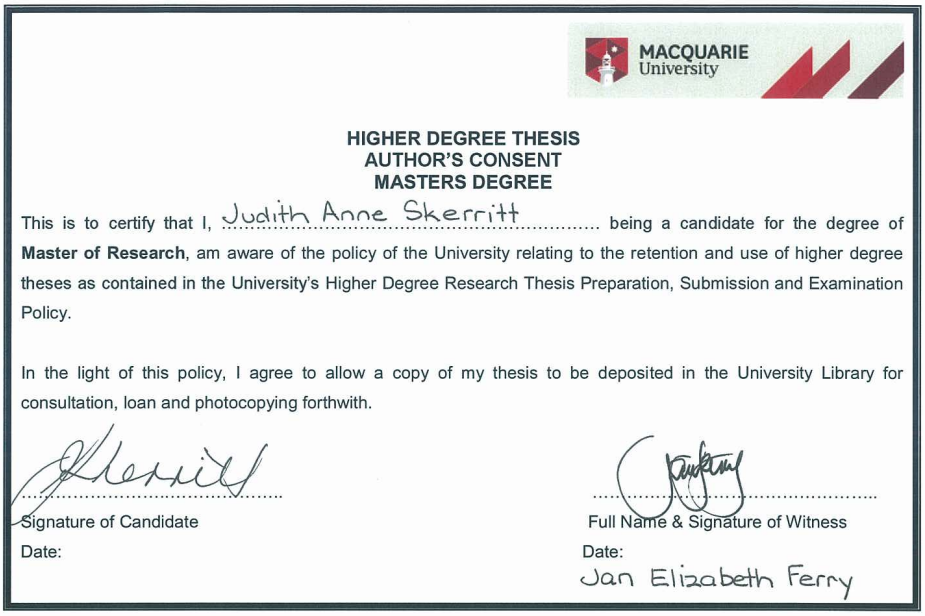
Abstract

Despite educator support of children's higher-level thinking being a stated requirement of the Early Years Learning Framework for Australia (EYLF) (DEEWR, 2009), the document provides little accompanying information to guide practice. There is open acknowledgement of compromises and assumptions made when developing the EYLF, not least the view that educators would already possess key knowledge of concepts outlined or would have access to this information from more experienced colleagues (Sumsion et al., 2009). This study questions whether this presumption is justified in relation to higher-order thinking. It argues instead that more needs to be known about the specific understandings and practices of educators in relation to children's thinking complexity, particularly given evidence pointing to concerning levels of instructional support linked to cognitively challenging experiences (Tayler & Thorpe, 2012; Tayler, Ishimine, Cloney, Cleveland & Thorpe, 2013; Tayler, 2014).

A multi-case study was designed to investigate the higher-order thinking beliefs and practices of three educators from preschool services rated as 'exceeding' in Quality Area 1 of the National Quality Standard (ACECQA, 2013), the area where support for thinking complexity should be visible. Five visits to each educator occurred. Data collection involved video-recorded teaching interactions, audiotaped educator interviews, secondary document analysis (e.g. portfolios) and field notes. While higher-order thinking was frequently noted, it tended to serendipitously emerge as a by-product of educator attention to, and promotion of, child interest. Progressive planning and assessment of children's cognitive understandings and thinking growth over time was not observed. With results confirming a close educator alignment with the EYLF, a refinement of this framework and/or aligned resources may be warranted in order to reposition a progression in child thinking as a core educator concern.

Statement of Candidate



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This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). Approval to conduct research was granted by Macquarie University Ethics Committee on 14th September 2015. Approval Number is 5201500661 (Appendix G).

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Chapter 1: Introduction

In Australia it is a requirement that higher-order thinking learning opportunities be incorporated into informal play-based experiences within licensed early childhood education and care (ECEC) settings. The national curriculum framework guiding educators working within ECEC settings, the Early Years Learning Framework for Australia: Belonging, Being and Becoming (EYLF) (DEEWR, 2009), states that educators will engage in "intentional teaching…[that recognizes] play provides a supportive environment where children can ask questions, solve problems and engage in critical thinking…[and where educators] actively promote children's learning through worthwhile and challenging experiences and interactions that foster high-level thinking skills" (p. 15). The omission of the term 'high-level thinking' from the glossary at the end of the document, combined with the fact that no specific information has been included in the accompanying Educators' Guide to the Early Years Learning Framework of Australia (DEEWR, 2010) or in the Australian Guide to the National Quality Standard (ACECQA, 2013), the benchmarking document that informs ratings and assessment decisions introduced as a key component of the National Quality Framework for Early Childhood Education and Care (COAG, 2009), indicates educator knowledge is presupposed or to be gained elsewhere (Sumsion et al., 2009).

The research presented in this thesis queries these assumptions. With limited guidance in key documents, it proposes that more needs to be known about how higher-order thinking is comprehended, implemented and sustained by educators in specific ECEC settings. It argues that accurate information about the extent to which the pedagogical realities experienced by young children are in alignment with statements within key ECEC documents is necessary for the effective development and refinement of educational responses likely to support cognitive growth in young children.

Using a multi-case study design, the thesis investigates the beliefs and practices of three ECEC educators tasked with supporting higher-order thinking in young

children. Each participating educator worked in the preschool room of separate ECEC services. The three services selected for the study were rated as 'exceeding' in Quality Area 1 of the National Quality Standard (ACECQA, 2013), the area where support for thinking complexity should be visible as it focuses upon educational programming and practice. Data collected from multiple sources (i.e. video-recorded teaching sessions, educator interviews, secondary documents and field notes) is presented and analyzed in order to uncover the specific beliefs and practices of the educators. The alignment between educators' teaching responses and statements associated with higher-order thinking within ECEC documents, particularly the EYLF, is also examined.

The thesis is set out in the following chapters. Literature informing the thesis is presented and analyzed in Chapter 2. In this chapter research on learning taxonomies and thinking levels, dispositional and meta-cognitive skill, open-ended questioning, and sustained shared thinking is described and interpreted. The methodology is outlined in Chapter 3. The information outlined in this section contextualizes and explains the reasoning behind service and participant selection, collection and coding methods, timeframes, and ethical protections. It acknowledges the very small sample size of ECEC services and explains transferability and generalizability limitations. Chapter 4 reports the findings using a conceptual framework (Figure 1) designed to authentically capture the specific context, views, assumptions, actions and planning outcomes of each educator. The discussion and conclusion are presented in Chapter 5 along with implications for practice and future research suggestions.

Chapter 2: Literature Review

This chapter records and analyzes key research related to higher-order thinking in young children. Discrete topic headings are utilized to accurately reflect the extent of holistic information available (Richland & Simms, 2015), and ensure an in-depth investigation of each impacting factor.

2.1 Learning Taxonomies and Thinking Levels

For some, higher-order thinking is aligned with cognitive classification systems or learning taxonomies that focus upon identifying, sequencing and assessing thinking processes. Perhaps the best known is the taxonomy developed by Bloom (1956). A classification system, it was designed to remove some of the vagueness from educational conversations involving 'thinking', in the process supporting more effective planning for, and evaluation of, learning. It features six levels of thinking abstraction beginning at the lower level and progressing to higher levels:

1. Knowledge
2. Comprehension
3. Application
4. Analysis
5. Synthesis
6. Evaluation

When operating at the lowest level or 'knowledge' stage, information based solely on memory is simply retrieved. As new knowledge is integrated into pre-existing mental frameworks 'comprehension' or understanding occurs. During this stage an ability to describe, differentiate, discuss, interpret, illustrate and classify the information is observable. Once this newfound knowledge starts to be utilized in concrete as well as unfamiliar contexts, 'application' is attained. Skills in deconstructing this new concept and relating the component parts, suggests an extra layer of thinking acuity and an advance to the level of 'analysis'. Further

progress or ‘synthesis’ occurs when a capacity to integrate knowledge from a range of sources is achieved. Here an ability to devise a new ‘product’ involving coherent planning becomes apparent. At the highest level of ‘evaluation’, competence emerges in assessing, critiquing and making judgments based upon fine comparisons, critical thinking and reflection, often involving considerable abstraction.

The taxonomy is structured so that simple and concrete ideas precede complex and abstract thought. Individuals operating at the initial ‘knowledge’ stage are considered functional at the simplest or lowest level of thinking complexity, a stage deemed fundamentally different from all others in that no interactive functions upon the remembered knowledge take place. The remaining five stages involve cognitive interaction; the knowledge acquired in the initial stage the pre-requisite for a range of intellectual operations performed upon that knowledge. And, as thinking intricacy and abstraction grows, individuals move through successive stages into categories deemed ‘higher-order’.

Almost fifty years later Lorin Anderson and David Krathwohl developed an important adaptation of this taxonomy to better align the tool with current educational theory and support more relevant planning for learning (Anderson et al., 2001). While the six stages were maintained there were changes: the terminology used to describe three was amended; the two highest were interchanged; and, category labels became verbs instead of nouns to describe thinking actions more accurately:

1. Remembering
2. Understanding
3. Applying
4. Analysing
5. Evaluating
6. Creating

The revised taxonomy also made explicit the two-dimensional aspects hinted at in the earlier Bloom (1956) original: that knowledge and the subsequent cognitive processes utilizing or manipulating that knowledge are distinctly different (Anderson et al., 2001). The addition of an extra knowledge category labelled 'meta-cognition' (e.g. cognitive strategies and the contexts in which they might be employed) was particularly significant in augmenting the repertoire of thinking 'tools' available for use when mentally manipulating information or 'thinking' (Pintrich, 2002).

While the taxonomies described are the most frequently cited in relation to higher-level thinking, the Structure of Observed Learning Outcome or SOLO approach (Biggs & Collis, 1982; Biggs & Tang, 2011) offers additional insight. The taxonomy identifies different levels of thinking, each of which is categorized and analysed. It posits that higher levels of thinking incorporate those from the lower levels but with additional components rendering them more complex as each new level is mastered.

Within school age curriculum documents these principles are central. For instance, the Mathematics K-10 Syllabus: NSW Syllabus for the Australia Curriculum (Board of Studies NSW, 2012), while omitting any direct mention of taxonomies, sets out learning outcomes using a continuum of levels that move from simple to complex thought. Statements like "… it will be necessary for teachers to determine the level of achievement of outcomes in previous stages before planning new teaching and learning experiences [and] …students need appropriate time to explore, experiment and engage with the underpinning concepts and principles of what they are to learn" (p.15), are pivotal to the document.

In contrast, despite the apparent soundness and appeal of taxonomies, there seems little attention within the ECEC sector focused upon the thinking hierarchies they outline. The principles underpinning taxonomies (i.e. basic knowledge and understanding precedes more complex thought manipulation) are

absent from significant ECEC curriculum and learning documents like the EYLF (DEEWR, 2009) or the Educators' Guide to the Early Years Learning Framework of Australia (DEEWR, 2010). Even when located in ECEC literature, enthusiasm appears tokenistic. For instance, Bryce-Clegg and Margetts (2014), who make specific references to Bloom's revised taxonomy, provide only a fleeting reference. Just a few dot points are proffered featuring basic examples of questions aligned to each level along with a sweeping statement to "use all of these with children" (p. 29).

2.2 Dispositions and Meta-cognitive Learning

Those accentuating a dispositional learning approach suggest that certain thinking habits or behavioural propensities are necessary for thinking to be 'activated' and that these 'dispositions' can be practiced and learned (Perkins, Jay & Tishman, 1993a, 1993b; Perkins, Tishman, Ritchhart, Donis & Andrade, 2000; Ritchhart, 2001; Ritchhart & Perkins, 2008; Costa & Kallick, 2008; Perkins, 2009; Salmon, 2008, 2010; Salmon & Lucas, 2011; Salmon, 2016). Specific abilities and skills are viewed as less critical than the disposition or inclination to utilize such capacity. The absence of these dispositions is seen as an impediment that can limit thinking capacity. New knowledge is not acted upon resulting in higher levels of thought around the particular knowledge or concept remaining undiscovered or under-utilized.

Citing the example of Charles Darwin, who legend suggests chose to pop a beetle into his mouth as a 'solution' to the lack of a container during a childhood fieldtrip as an example of the intellectual flexibility required for cognitive advancement, Perkins et al., (1993b) put forward seven dispositions collectively considered necessary for this type of "flexible, insightful, productive thinking" (p. 3):

1. A broad and adventurous approach
2. Sustained intellectual curiosity
3. An urge to clarify and seek understanding

4. Planned and thought through strategies
5. Care and precision around intellectual engagement
6. A desire to uncover and evaluate reasons
7. Meta-cognitive awareness

This list challenged theories that reduced thinking complexity to ability-centred knowledge alone. Three inter-related thinking requirements were identified: inclinations or tendency to act in a particular manner; sensitivities or alertness to opportunities that might be appropriate for the application of such inclinations; and, abilities or capacity to follow through on these inclinations.

Interest in the role dispositions play in supporting or enhancing thinking complexity is long-standing. In 1910 John Dewey wrote extensively on the subject in his seminal work *How We Think.* In 1933 he published again, elaborating and extending upon his earlier ideas. Dewey not only identified crucial dispositions of open-mindedness, whole-hearted interest/absorption and responsibility, he also emphasized that awareness and understanding of these dispositions will be insufficient without a commitment and desire to utilise them productively. He was especially concerned with locating the 'correct' balance between the amount and type of explicit and implicit information needed to guide effective thinking dispositions.

2.2.1 Dispositions and Meta-cognition in ECEC Settings

Within the ECEC sector, implicit responses have traditionally been favoured. The preferred approach involves resource provisioning of interest-led play-based experiences augmented by educator scaffolding that does not disrupt children's intentions or enjoyment. Notwithstanding this preference, several researchers found benefits when greater levels of explicitness were introduced into ECEC learning settings.

In 2008, Angela Salmon commenced an action research project to investigate how educators working with 3-5 year old children in two 'Reggio-inspired' services might create a more explicit 'culture of thinking'. A series of targeted thinking routines designed to increase the visibility of the meta-cognitive processes involved in effective thinking were introduced in an attempt to reinforce practices or patterns aligned to greater thinking acuity. Salmon adapted everyday routines and resources used by educators to make explicit or 'visible' what otherwise would have remained implicit or (quite possibly) undiscovered. One specific example, using the 'Think/Puzzle/Explore' routine, involved the children being presented with an image of Rousseau's Notre Dame painting. After superficially viewing the painting with the children, the educator proceeded to engage them in conversations involving: what they thought they knew about the work; what questions they had; and, what they wanted to investigate further. A rich discussion about weather, housing and customs ensued, followed by later expressions of the children's ideas in drawings and conversations. Another example cited, the 'Connect/Extend/Challenge' routine, attempted to make visible the way a new idea can be linked to pre-existing knowledge. While there were significant challenges experienced (e.g. children answering "I don't know"), there were many innovative and simple 'remedies' offered by committed educators who themselves were having to put into practice effective thinking strategy (e.g. incorporating the 1975 Dr. Seuss book 'Oh the Things You Can Think'). The findings were supportive. When educators actively incorporated targeted thinking routines into everyday ECEC practices that recognized children's interests, strengths and individual characteristics and perspectives, the children's dispositions around thinking and learning were not only strengthened but their awareness of their own thinking (meta-cognitive knowledge) expanded considerably. Based upon her research, Salmon contended that when educators consciously invoke the 'language' of thinking (meta-cognitive processes), increased sophistication in children's cognitive processes occurs.

In 2011, Salmon and Lucas conducted in a 6-month study of 146 children aged 3-5 years within educational settings involving 10 teachers. With 'visible thinking'

routines again the focus, the authors used a 'drawing-telling' strategy to investigate children's thinking dispositions. Although the findings based upon pre and post-test results come from a small sample they provided interesting insights. The 4-5 year old children benefited significantly from 'visible thinking' (VT) strategies: those educators using VT questions, conversations and prompts elicited an increase in strategic and meta-cognitive responses and a corresponding decrease in associative answers featuring a non-complex reference to the created object or image. While there were no changes documented in the type and level of responses for 3 to 4 year old children, the authors advocated for further research into the age group.

Salmon (2016) reinforced the view that educators can promote more effective thinking by engaging children in reflective conversations designed to enhance meta-cognition while concurrently supporting dispositions conducive to thinking. Participating as a 'thinker in residence' in a Melbourne ECEC centre, Salmon studied a group of 58 preschool children and their educators over 6 weeks. Thinking routines were again noted for their potential to boost thinking. So too were the learning and self-esteem benefits likely to accrue to children who value their own thinking and who feel valued in return.

The research of Siraj-Blatchford and Siraj-Blatchford (2002) lends weight to those claiming beneficial outcomes when thinking processes are a conspicuous part of the learning process. The authors proposed that the provision of materials along with broad encouragement is unlikely to lead to positive learning dispositions or enhanced knowledge and understanding without targeted input to focus the natural curiosity of children. By pointing out that scientific and technological knowledge and practice has accumulated over extended time periods, and that the thinking skills involved in these discoveries are not necessarily intuitive, the authors highlighted the likelihood of learning limitations for children if they are not assisted to identify and practice the specific thinking skills underpinning these advances. By stressing the need for "instruction, engagement and involvement…[as] conditions for effective learning" (p. 213), Siraj-Blatchford and

Siraj-Blatchford reinforced the close alignment between dispositions, meta-cognition and effective learning.

Claxton and Carr (2004) took a slightly different approach. Instead of viewing dispositions as outcomes to be achieved, they preferred a more action-oriented framework represented by a range of descriptive verbs and adverbs designed to capture gradual changes over time. They suggested dispositional tendencies become stronger when appropriately reinforced by educators able to focus skillfully and intentionally upon three key dispositional dimensions: "…increasing their frequency and robustness, widening their *modus operandi*, and deepening their complexity and competence" (p. 95). Like other ECEC researchers (Siraj-Blatchford & Siraj-Blatchford, 2002; Salmon, 2008; Salmon & Lucas, 2011; Salmon, 2016), they acknowledged the need to make visible or 'reify' beneficial learning dispositions through targeted explanations, guidance, commentaries, questions and modeling.

Within Australian ECEC settings the EYLF (DEEWR, 2009) actively promotes dispositional learning. However there are no specific guidelines on the most effective method to utilise. While several of the studies cited in this review focus primarily upon specific teaching techniques (e.g. routines like 'Think/Puzzle/Explore'), the EYLF outlines only broad approaches. For instance, in Outcome 4, which includes the statement "Children develop dispositions for learning such as curiosity, cooperation, confidence, creativity, commitment, enthusiasm, persistence, imagination and reflexivity" (p. 34), the possible learning strategies listed are very general: listening carefully to children's ideas and joining in conversations or offering additional thoughts; promoting explorative learning processes; and, providing opportunities for children to revisit and extend their thinking. Despite the abiding interest in this topic as well as significant research documenting potential learning gains, the practices of Australian educators in relation to dispositional drivers of learning, particularly those linked to the facilitation of higher-order thinking, appear to be based upon supposition.

2.3 Open-Ended Experiences and Questioning

The view that open-ended experiences facilitate higher levels of thinking by encouraging consideration of more than one correct response to stimuli is well supported within the ECEC sector (DEEWR, 2009; DEEWR, 2010; McKnight & Mulligan, 2010; Curtis, Brown, Baird & Coughlin, 2013; Maynard & Ketter, 2013). Open-ended questioning is also widely acknowledged as a key educator strategy likely to increase higher-order thinking and linguistically advanced responses from children (Wittmer & Honig, 1991; Siraj-Blatchford, Sylva, Muttock, Gilden & Bell, 2002; de Rivera, Girolametto, Greenberg & Weitzman, 2005; Youngju, L., & Kinzie, 2012). Yet, while open-ended experiences are clearly visible in ECEC services (e.g. open play options in the block play area, home corner, sandpit, painting area and collage spaces), recent ECEC research raises doubts about the extent of open-ended questioning. Indeed, it may be that the use of this type of questioning to expand thinking capacity is more rhetoric than reality.

When Siraj-Blatchford and Manni (2008) examined open-ended questioning within ECEC services as part of an extension to the Researching Effective Pedagogy in the Early Years (REPEY) and Effective Provision of Pre-School Education (EEPE) studies undertaken in Britain, they found that an overwhelming percentage of all questions asked of children (94.5%) were closed requests based upon memory recall, behavioural expectations or a selection between limited options. Some questions elicited no response at all. Only 5.5% of the total were categorized as ‘open-ended’. According to Siraj-Blatchford and Manni, these statistics suggest limited support for children to engage in higher-order thinking through sustained shared thinking that invites speculation, analysis, evaluation or creative response.

The research of Birbili (2013) around open-ended questioning is similarly dispiriting. The study investigated the use of open-ended questioning within ECEC services in Greece. Approximately 110 ECEC teachers were presented with a series of hypothetical teaching situations with a request to outline possible learning

goals and aligned questioning to achieve these goals. Birbili found the vast majority of questions were based upon recall or memory with an exceedingly low number designed to foster high level thought and discovery. For instance, the majority of teacher responses to a situation involving 'George making a "cake" out of play dough', preferred to use the hypothetical incident as a stimulus for a dental hygiene or nutrition discussion. Most questions proffered were closed and concerned with locating 'correct' answers rather than exploring ideas and uncovering thinking. "Should we eat sweets?" (p. 1106) was cited as the most common question. A second scenario labeled 'reading Little Red Riding Hood' uncovered similar responses. Teaching suggestions followed a theme of 'stranger danger', obedience and elder care. Favoured questions sought accurate recall around what happened, types of dangers present, outcomes arising from disobedience and the 'rightness' of Riding Hood's decision.

Birbili also highlighted a distinct predilection for turning opened ended possibilities into more didactic teaching opportunities without any apparent concern for the child's creativity and expansive thinking skill (e.g. making a play dough cake shifts from an exciting imaginative game of child-engineered possibilities to one laden with moral messages about incorrect eating). Most worrisome to Birbili was the underlying message being conveyed: teachers transmit knowledge and children absorb it uncritically.

Wasik and Hindman (2013) raised similar concerns. When outlining the benefits of open-ended questioning within early childhood settings, they drew upon current research to highlight operational realities and provide a range of practical suggestions to address identified shortcomings. After noting the limited use of open-ended questioning by educators in general, they pointed out that even when used, educators seemed disinclined to wait sufficient time for the development of reasoned responses from children, or failed to use the responses offered as scaffolding opportunities. Consequently they claimed, "children's use of language in classrooms is very limited and does not provide the opportunity to expand their ideas in more rich, elaborated ways" (p. 310). This assertion implies

prospects for higher-order thinking through open-ended question are likely to be quite constrained. Particularly worrying is the authors' contention that children who most need to be exposed to sophisticated language in their ECEC setting (as it is absent in their home environment) are those least likely to experience it, thereby denying them opportunities to engage in more complex thinking and language interactions, and (potentially) limiting their access to the full range of school and life possibilities. The view is not without support. Snow, Tabors and Dickinson (2001) emphasized the potent risk associated with children from disadvantaged backgrounds being far less likely to hear and engage in complex language and thinking interactions guided by skilled educators.

Additional factors influencing the likely realization of higher-level thinking warrant consideration. For instance, Siraj-Blatchford and Manni (2008) found restricted thinking benefits when: an educator asked an open question but accepted only one answer; or where an open question generated many answers but only one was deemed correct; and, where an open question was immediately followed by a closed question. On the other hand, reducing the complexity of questions can have learning benefits. Massey, Pence, Justice and Bowles (2008) described less cognitively challenging questions as potentially beneficial in paving the way for those requiring greater cognitive demands. Beauchat, Blamey and Walpole (2010) noted their use in accommodating different levels of child understanding as well as comfort levels in being cognitively stimulated. And when used as part of a wider repertoire, the use of non-open questioning to quickly discern comprehension or highlight a critical point may alleviate some of the concerns raised by those identifying limitations in complex thinking in areas requiring specific and explicit meta-cognitive processes and conceptual information (Siraj-Blatchford & Siraj-Blatchford, 2002; Salmon, 2008, Salmon & Lucas, 2011).

Pulling all of the disparate strands together, sophisticated educator knowledge and skill levels appears necessary to ensure open-ended questioning can be meaningfully combined with other teaching strategies to maximize children's thinking complexity. Despite being actively promoted by the EYLF (DEEWR, 2009)

and aligned documents (DEEWR, 2010; ACECQA, 2013), there is little specific detail guiding educator understandings of open-ended questioning. And with research findings highlighting a range of concerns, a fuller appreciation of the manner in which Australian educators are utilizing open-ended questioning to advance thinking complexity would seem desirable.

2.4 Sustained Shared Thinking

Sustained shared thinking (SST) is formally defined as a teaching episode designed to enhance learning in which " two or more individuals 'work together' in an intellectual way to solve a problem, clarify a concept, evaluate an activity, extend a narrative, etc" (Siraj-Blatchford et al., 2002, p. 8). A balance is advocated between the intellectual, dispositional and social dimensions of the learning process as well as teacher initiated group work and free play opportunities with inbuilt teaching potential. Open questioning and educator modeling of learning dispositions and skills are also promoted.

SST gained prominence as a result of the much publicized Effective Provision of Pre-school Education (EEPE) Project, a longitudinal study that commenced in 1997 involving approximately 3000 children aged from 3 to 7 years from 141 ECEC centres in England (Sylva, Melhuish, Sammons, Siraj-Blatchford & Taggart, 2004), and the related Researching Effective Pedagogy in the Early Years (REPEY) case study (Siraj-Blatchford et al., 2002) which investigated 14 of the EEPE settings deemed effective in boosting learning. The frequent identification of shared thinking and the sustained nature of interactions in settings recording positive child outcomes not only led to the development of the term SST but widespread enthusiasm for the associated practices in the hope of enhancing children's thinking skill.

A subsequent paper by Siraj-Blatchford (2009) investigated in more detail how SST might be effectively implemented. Outlining a model labeled a 'pedagogic progression of play', Siraj-Blatchford advocated careful and sequential alignment

to each child's current and emerging level of cognitive skill and play activity. Her progression involved the identification of 4 play possibilities: emotional communication with caregivers; object-centred joint activity; socio-dramatic play, and; transition to learning activity. Also outlined were SST suggestions, developmental opportunities, learning possibilities and appropriate pedagogical responses. For instance, social dramatic play was seen as a pedagogical opportunity for "modeling by adults and peers with progressive reduction of scaffolding in the provision of ideas and themes…encouraging play with more capable peers…[and the] introduction of games with more sophisticated rules" (p. 82). The learning and development specifically associated with this type of play included use of symbols in thinking within collaborative social situations involving negotiation and increasing meta-cognitive awareness. As the child progressed in their cognitive understanding and capacity, the educator would expand thinking complexity by extending play over longer time periods and incorporating deeper and intellectually focused investigations involving self-regulation, planning and memory. Siraj-Blatchford made the case that SST needs to be more than a general commitment to engage children in sustained conversations according to what takes their fancy on a day-to-day basis. Rather, it should be a teaching practice used in an intentional and progressive manner to enhance each child's thinking complexity; a purposeful scaffolding that builds sequentially upon current cognitive and conceptual capability.

The recently published SSTEW Scale (Siraj, Kingston & Melhuish, 2015) currently being utilized in many centres across England demonstrates how SST continues to evolve. An attempt to make 'focused thinking' more explicit while concurrently reinforcing social and emotional development, the Scale is an educational 'tool' that provides educators with additional information to consider when planning for SST. The terms 'higher-order thinking' and 'concept development' are combined (Sub-scale 4, Item 12). Information guiding excellent practice describes a progression in concept planning whereby children are assisted to consolidate previously encountered or emerging conceptual understanding through a range of intentional experiences featuring overt links between earlier experiences,

knowledge and real life. Actual concepts to be explored are unstated however there is a clear expectation the Scale will be combined with other resources and implemented by skilled educators. Importantly the SSTEW Scale maintains support for an interest-led planning process.

Within the Australian context, SST is referred to only once in the EYLF (DEEWR, 2009). No definition of the term is provided. However the word 'sustained' is used on multiple occasions and in a range of broad contexts to denote the importance of prolonged interactions and conversations. While the ideas central to SST are conveyed in the underlying message of the document, any indication that SST is a complex pedagogical 'tool' requiring significant educator knowledge and skill is absent. It may be that these omissions and generalizations are a consequence of the many assumptions and compromises made when developing the EYLF, not least the expectation that more knowledgeable educators would guide those less informed (Sumsion et al., 2009).

Regardless of causation, doubts regarding educator capacity remain. Tayler (2012) articulated a concern that the hoped for gains outlined by the National Quality Framework (NQF) (COAG, 2009) may turn out to be little more than hyperbole without a more considered and evidence-based pedagogical response to educator skill level variations. Maintaining the centrality of SST, Tayler advocated an approach featuring targeted structural support for educators in order to enhance their pedagogical practice. She accentuated the importance of "academic content and tasks… [featuring] the use of material and experiences that directly enhance learning " (p. 14). Also advised, was regular collaboration and rigorous analysis of learning strategies and associated child outcomes led by highly experienced and knowledgeable educators capable of resisting the appeal of non-confronting ideas and uncritical acceptance. Citing Ball and Cohen (1999), Tayler noted the absence of learning outcome improvements for children from 'affirmation-only' low-level dialogues between educators. Tayler's paper has particular pertinence given the great diversity of service types and staff qualifications (Productivity Commission, 2014a, 2014b) and the aligned unequal access for children to educators capable of

having a positive impact upon learning and intellectual growth.

Others too have articulated concerns. Siraj (2015) described the EYLF as a "half curriculum" offering minimal support to educators in the areas of mathematics, science and technology. Cohrssen, Church, Ishimine and Tayler (2013) outlined EYLF limitations as a possible contributory factor to the constrained educator comprehension of mathematics concepts located during an investigation involving a small group of ECEC educators. Low levels of instructional support associated with preschool concept development and cognitively challenging dialogue have also been uncovered in a range of ECEC settings (Tayler & Thorpe, 2012; Tayler, 2014). These findings suggest that educator skill and knowledge associated with SST interactions designed to promote higher-order thinking may be similarly impacted.

2.5 Summary and Research Question

The multiple lenses through which higher-order thinking can be viewed complicate the search for clarity. Despite considerable gains in the way our knowledge base around the concept is framed, much remains unclear. Given the complex and broad ranging nature of information around higher-order thinking, it is unsurprising there is significant segmentation of knowledge and analysis with little directly tying the multiple areas into a systemic or holistic picture. The present study attempts to address this issue by gathering data on a range of factors informing ECEC educator practice in relation to how higher-order thinking skill development in children is informed and sustained.

The research question to be addressed in this thesis is 'How is higher-order thinking in young children understood, supported and sustained by educators within three ECEC preschool settings?' The aim of the research is to develop an enhanced understanding of how higher-order thinking in young children is comprehended and promoted by educators within three ECEC preschool settings while concurrently gaining insight into:

- educator understanding of thinking levels and/or processes and how they apply to young children; and
- educator views on what has influenced their beliefs and practice around thinking levels and processes.

Given the inclusion of higher-order thinking within educational programs is a national EYLF curriculum objective (DEEWR, 2009), it is important that those connected with the sector have access to evidence that describes and attempts to explain: the contexts under which higher-order thinking occurs, as well as; the educator perspective on how it is understood and practiced. Such information has the potential to fill a gap in current ECEC knowledge.

Chapter 3: Methodology

This chapter describes and explains the methodology. Service and participant selection, collection and coding methods, study timeframes and organizational detail, validity strategies and ethical protections are outlined and given context. The limitations of the small sample are acknowledged and discussed.

3.1 Methodological approach

A case study approach was chosen to maximize systemic understanding of the multiple factors that combine to influence higher-order thinking in young children. By recognizing and capturing the complexity that exists within a bounded ECEC setting, a case study supported a holistic investigation of the phenomenon of 'higher-order thinking'. It allowed close scrutiny of component parts using a mixture of natural, descriptive and heuristic methods to uncover rich detail within clearly defined contexts (Gay, Mills & Airasian, 2014). Of the three types of case study identified by Stakes (1995 as cited in Johnson & Christensen, 2012), the multiple-case design most closely aligned to the research question. Documented advantages included: opportunity for both within-case and cross-case data analyses; an increased likelihood that similarities or differences existing across cases will identified; and, an enhanced probability that broad patterns or themes may emerge with the potential to provide additional explanation or insight and/or scope for generalization and wider system understanding through replication logic (Eisenhardt, 2002; Yin 2009; Johnson & Christensen, 2012).

Three ECEC preschool services were chosen using purposive sampling in order to locate potentially data rich cases. Selection was further refined through the use of critical case sampling to increase the likelihood that participant services would be intentionally incorporating at least some level of higher-order thinking into their educational programs.

Multiple methods and data sources were employed. These included direct

observations and videotaping of child/educator interactions, semi-structured interviews with key educational staff, field notes and secondary data including written educational programs, pedagogical documentation and child learning portfolios.

3.2 Participants

Three licensed services delivering preschool programs to children 3-5 years within the Lake Macquarie region of the Hunter Valley were selected. The research question was narrowed from ECEC settings for children ages 0-5 years to those delivering programs for preschool children only (i.e. children 3-5 years). This decision was made to focus upon the ages where the most observable gains in cognition have been located (Saracho & Spodek, 2007; Mathers et al., 2011; Warren & Haisken-DeNew, 2013) and to ensure a manageable study within available resource and time constraints.

The Hunter Valley is situated within regional NSW, 130 kilometres north of Sydney and with a population reported in 2013 as 661466 (Hunter Valley Research Foundation, 2014). Covering a wide geographic area, Lake Macquarie is the largest single region of the Valley with a population recorded in 2013 of 200796. With the researcher residing in Lake Macquarie the choice offered a range of benefits: access to a large population within a significant region of NSW; flexibility for services who may need to vary visit times and dates at short notice; and, minimization of travel and accommodation costs likely to be incurred during data collection.

Services chosen to participate were rated as ‘exceeding’ in Quality Area 1 of the National Quality Standard regulatory system (ACECQA, 2013). This area outlines the criteria expected of ECEC services in relation to educational programming and practice. It includes a statement that educators will “actively promote children’s learning through worthwhile and challenging experiences and interactions that foster high-level thinking skills” (ACECQA, 2013, p. 42). By narrowing the selection

to these services, the likelihood of locating educators incorporating higher-order thinking into their programs was increased. A shortlist of potential services meeting the criteria for inclusion was formulated by referral to the National Registers (ACECQA, 2015). Three services were approached and, when interest was confirmed, formally invited to participate.

Only one room from each service (i.e. the 3-5 year old room), and one key educator from that room, was selected. All educators in the preschool room were involved in choosing the key educator to minimize the likelihood of coercion. There was no stipulation regarding key educator qualifications even though the sector recognizes three different ECEC qualifications skill levels in the Education and Care Services National Regulations (Commonwealth of Australia, 2011): a teaching degree from a university; a diploma from a vocational institution; and, a minimum level certificate, also from a vocational institution. Surprisingly no ECEC teacher was chosen. All key educators held diploma qualifications in early childhood education and care, although two held degree qualifications in other areas: one in geology/climatology; and, the other in visual arts. An attempt to represent both genders was successful. Two of the three key educators were males.

3.3 Procedure and Data Collection

Site visits occurred weekly. Including an initial familiarization visit, there were 5 visits in total to each site. A total of 8 weeks was allocated for completion of data collection (i.e. 21st September to 14th November 2015). This ensured sufficient time to build up a comprehensive picture of educator intentions and practice as well as accommodate work schedules and educator and/or service availability.

During these visits multiple methods and data sources were employed to generate a detailed understanding of each case and to minimize weaknesses from any one method or data source (Johnson & Christensen, 2012; Gay et al., 2014; Tessier, 2012). These included:

3.3.1 Direct Observations

Direct observations allow data collection on a phenomenon within the natural environment in which it occurs, unimpeded by researcher manipulations or alterations (Gay et al., 2014). The method was appropriate given the intention of this research was to uncover the actual practices, understandings, beliefs and intentions of educators interacting with children within their own education settings.

During the 2nd visit, direct observations of the key educator commenced. For a period of 4 weeks, 1 observation period per educator lasting 2 hours took place (i.e. 4 observations over 8 hours for each key educator). The key educator was video-recorded interacting with children in a range of learning situations including:

- informal free play learning sessions within different learning areas (e.g. construction play or dramatic play);
- formal group learning sessions (e.g. language or mathematics or science); and/or
- small group learning sessions (e.g. projects).

Video-recording aided accuracy of transcription, coding and analysis and prompted a deeper exploration of key educator intentions during interviews. It also assisted in identifying non-verbal interactions taking place within a teaching moment that might otherwise have been missed.

An iPhone 6 camera was utilized. The device had several advantages: it was readily accessible; small and relatively unobtrusive; easy to use; familiar to the children who are used to educators documenting their learning using similar hand held devices; and able to produce acceptable video quality. iMovie software was used to edit video footage into manageable segments of specific interactions that were then shown to educators during interviews to gain deeper understanding of

their intentions.

3.3.2 Semi-structured Interviews

Interviews are widely acknowledged for their usefulness in allowing researchers to more fully investigate information gained through observation (Creswell, 2012; Gay et al., 2014). The semi-structured interview was selected as it is acknowledged as an effective method for uncovering comprehensive information in a systematic way while maintaining the necessary informality required to encourage an open and in-depth exploration of issues emerging during a study (DiCicco-Bloom & Crabtree, 2006; Johnson & Christensen, 2012).

Based upon these advantages, interviews of approximately 30 minutes with the key educators were employed to facilitate discussions around observed interactions as well as to member check accuracy of understanding and/or augment insights obtained through other data collection methods. With the exception of the orientation visit, interviews occurred on each visit, resulting in a total of 4 interviews per educator. A semi-structured interview schedule (Appendices A, B) informed the discussions during the 1st and 4th (i.e. final) interviews. The use of open-ended questioning within the loosely scripted interviews encouraged the exploration of wide ranging possibilities while concurrently minimizing researcher priorities leading educator response/s. Conversations were not restricted to items listed given the difficulties in knowing in advance what the educator might deem relevant. Some questions elicited responses beyond the scope of this research and were not included in the analysis (e.g. “What influence do you believe the learning you undertook while gaining your educational qualifications has had on your views?”). During the 2nd and 3rd interviews the primary focus of discussions was the teaching interactions that had been video-recorded during the previous site visit. A particular emphasis was placed upon teaching intentions and the techniques used to support and promote higher order thinking, as well as the ideas and perspectives of the educators in relation to children’s thinking growth. For example, after viewing a video segment

of his teaching from the previous week, one educator was asked an open-ended question regarding the purpose of the viewed experience. Having established this base-line information, more specific detail sought: “You used the term ‘thinking brain’ when supporting one child. [Can you] talk to me about that?”

All interviews were audio-taped. This supported transcription, coding and analysis accuracy.

3.3.3 Field Notes

Field notes formed part of the data collection process given the view that a ‘narrative’ of experience/s is enhanced by a combination of collection methods likely to minimise weaknesses inherent in any one method (Gay et al., 2014; Johnson & Christensen 2012; Tessier, 2012). By capturing incidental occurrences, reflective insights and comments not visible via other methods, they proved useful in contextualising data.

3.3.4 Secondary Documents

Access to supplementary or secondary information has the potential to augment or corroborate information gleaned from other sources (Johnson & Christensen, 2012). Where easily accessible and directly linked to the research question, they can save time and resources needed to undertake effective data analysis (Smith, 2011). Consequently, secondary documents such as the learning program or journal, child observations, teaching plans and analysis, child learning portfolios and/or developmental records, were included as data where available. Primarily written by the key educator, secondary documents were occasionally a collaborative effort.

3.4 Visit Structure

Table 1 provides a summary of the number, timing and purpose of educator visits.

Table 1: Visit Structure

Week 1		Week 2	Week 3	Week 4
Visit 1	*Visit 2*	*Visit 3*	*Visit 4*	*Visit 5*
Familiarization visit Field notes	Audio-taped interview (Appendix A)	Audio-taped interview featuring selected video footage from previous week/s and/or other educational documents deemed relevant by the educator		Audio-taped interview (Appendix B)
	……Video-recorded observation of educator……			
	……..Secondary document/s access…….			
	……..Field notes……			

3.5 Data Analysis

The process of organizing the data commenced with transcription of videoed observations and audio-taped interviews into text to facilitate more effective analysis. Once transcribed, the inductive process of making sense of the data (i.e. coding) began.

Coding followed a process identified by Lichtman (2013) defined as the "three Cs of data analysis: codes, categories and concepts" (p. 252). Adhering broadly to these principles, it involved the identification of meaningful text segments or context information, which were then assigned labels or descriptive codes. Next followed the grouping into subsets of related topics or like 'units of meaning' organized according to possible relevance. Lastly overarching themes of significance were aggregated and given conceptual descriptors.

The software package NVivo for Mac (QSR International, 2014) was utilized to facilitate text-based data searches, a process that hastened and strengthened sorting, locating similarities and searching for possible relationships.

In practice, coding was less straightforward. After uploading text data to NVivo, the transcripts of educator direct observations were scrutinized for segments of meaningful text (either words, phrases or longer blocks of text). Once pinpointed, they were given labels. As similarities and subtle differences between text categories began to emerge, further sorting into themes and sub-themes occurred. For example, the 'questioning' category expanded to include a range of aligned themes or sub-themes: child and educator-initiated open, closed and rhetorical questioning with an outcome of either sustained shared thinking, limited cognitive exchange or no response.

With a 'starting point' established, the transcripts of the educator interviews were analyzed. As additional layers of meaning were uncovered, or doubts raised regarding an earlier interpretation or coding decision, categories and themes were further amended. Finally, field notes and secondary source data were examined. This information proved useful in reminding of important viewpoints held at the time of data collection or in offering examples and alternative perspectives: sometimes earlier coding decisions were reinforced, on other occasions adjustment proved necessary. Coding to this point was orderly and sequential (i.e. direct observation transcripts followed by interview transcripts, then field notes and secondary source documents). However, the next (and final phase) of coding was far less structured. What had been a systematic and ordered process segued into a messy, unpredictable, back and forth 'dance' involving constant cross-referencing and re-checking across the multiple data sources to refine meaning and boost accuracy.

The conceptual framework (Figure 1) surfaced during this latter period. The selection of one of the component terms (i.e. implicit assumptions) offers insight. When cross-referencing teaching strategies, it was noted that the concepts of

'play' and 'relationships' kept reappearing, mostly via indirect references during the interviews. For instance, when Andrew was describing the techniques he utilized to promote complex thinking, he provided detailed information in which 'play', while not part of the question, was assumed in his response: "If I see indicators that the 'play' is starting to weary and could be enhanced, I might jump in with an idea …". This was also true for the other educators. When Katelyn was explaining how she determined her educational focus, her response presumed the importance of relationships: "by communicating with the family, really observing the child…just being quiet and watching the body language …you have to know these children". With other examples also appearing, it seemed increasingly likely that the concepts of 'play' and 'relationships' were 'givens', requiring limited or no contextualizing detail or explanation from educators. To reflect this 'reality' the term 'implicit assumptions' was chosen, as it seemed to effectively capture the unconscious and intuitive manner in which play and relationships underpinned the educators teaching processes. When creating and positioning the other elements in the conceptual framework, similar processes occurred: the final result a framework designed to accurately and authentically represent the views and operational patterns and behaviours of the educators in relation to higher order thinking.

3.6 Ethical Practice

Where accurate and in-depth information, disclosure and discussion are sought, high levels of respect and trust between the participants and the researcher are essential (Creswell, 2012; Johnson & Christensen, 2012). Particularly so in qualitative research where data collection evolves organically, leading to issues not previously countenanced, or where researchers are personally involved in interactions (Gay et al., 2014). To guard against the research being derailed due to inadequately considered ethical guidelines the following processes were put in place to ensure participants: were not harmed or deceived or any way; were able to provide informed consent; were free to withdraw at any time; and, had any information they disclosed treated confidentially, anonymously and with respect

(Johnson & Christensen, 2012).

1. The provision of a current NSW Working with Children check (Office of the Children's Guardian, 2014) to participating services.
2. The approval of Macquarie University Ethics Committee who specified several adjustments prior to approaching services.
3. A formal letter to participating services approved by Macquarie University Ethics Committee explaining the nature and purpose of the study.
4. Written informed consent prior to study commencement from service management, service educators and parents of all children.
5. Verbal child consent. This protection was added to ensure that any child dissenting or showing distress during data collection would have their wishes respected and be excluded from data collection.

3.7 Validity

Multiple strategies to strengthen the trustworthiness were adopted. The validity types utilized in this research are those outlined by Johnson and Christensen (2012). They incorporate areas of credibility, dependability, confirmability and transferability described by Lincoln and Guba (1985).

3.7.1 Descriptive Validity

The factual accuracy of data is amplified by the use of multiple methods. Video-recording key educator interactions and audio-taping interviews supported the credibility of descriptive data by providing a readily accessible primary source record. The process of member checking during interviews by regularly paraphrasing to corroborate impressions reinforced descriptive accuracy. It is acknowledged that investigator triangulation would have further strengthened descriptive validity, however the potential loss of relationship 'intimacy' necessary for deep insights and disclosure risked negating possible benefits. Consequently it was discounted.

3.7.2 Interpretative Validity

The extended timeframe of the study (i.e. 5 visits over 4 weeks) facilitated the development of trust and open discussion essential for data accuracy. Member checking during interviews and the use of low inference descriptors designed to heighten clarity around participant meaning also augmented veracity. This was assisted by video-recording learning interactions and transcribing them into text, thereby ensuring actual conversations informed analysis.

3.7.3 Theoretical Validity

Given stable patterns that emerge over time are more reliable, the use of extended fieldwork promoted theoretical validity by guarding against 'once off' occurrences informing conclusions.

3.7.4 Internal Validity

Multiple methods (i.e. methods triangulation) augmented confidence in data credibility. Any omissions, weaknesses or doubts within a single method were minimized by the inclusion of other evidence. The collective case study design also supported data triangulation within each method; each key educator participated in data collection on 4 separate occasions.

The use of video and audio-taping strengthened credibility by providing a readily accessible primary source.

3.7.5 External Validity

Although limited case studies do not support transferability or generalization to other similar situations (Johnson & Christensen, 2012), a number of techniques to reinforce such validity were nonetheless included. By providing a comprehensive description of the participants and their teaching and learning contexts, those

wishing to generalize to other situations have significant detail to make informed decisions regarding possible replication and/or comparative analysis. The multi-case design whereby three sites were investigated, combined with the use of purposive sampling designed to locate potentially rich cases and the use of critical case sampling to further increase the likelihood that higher-order thinking was likely to feature in cases selected, all supported the potential for transferability of any patterns or conclusions identified to similar contexts.

3.8 Limitations of the Design

Despite attention to external validity, the very small sample of ECEC services studied ensures limited transferability and generalizability. It is also acknowledged that the data was collected and interpreted by only one researcher. Although this decision was made to support the development of intimacy necessary for sharing detailed, and often personal, information necessary for the study, it is recognized as a significant constraint. In order to limit the possibility of narrow or biased interpretations of data, extensive discussions with the thesis supervisor were a feature of the study.

3.9 Summary

In this chapter, I have described the methods employed to address the study aim and research questions. The rationale for selecting a multi-case study was outlined. Specific benefits to be gained from within-case and cross-case analysis of data were highlighted. Validity methods were outlined, with particular emphasis placed upon the use of multiple methods of data collection and the extended timeframe of the study in order to strengthen confidence in the findings. A list of ethical protections was provided, with specific attention drawn to the verbal permission required from individual children to ensure their rights and views were respected. The small sample size was acknowledged as a limitation of the design. So too was the reliance upon data collected and interpreted by only one researcher.

Chapter 4: Findings

In this chapter the major findings in relation to how higher-order thinking in young children is understood, supported and sustained by three preschool educators are outlined and discussed. They are presented using a conceptual framework (Figure 1) as it allows for a more nuanced representation of the views and practices of the educators.

4.1 Conceptual Framework

During the data analysis process a range of themes was gradually revealed. Over time a series of connections between the different themes became evident as well as a distinct progression from one thematic grouping to another. In order to capture the pattern that surfaced, a conceptual framework was established (Figure 1).

The framework commenced with the specific context of each educator as this theme filtered through all others, subtly changing interpretations in ways that seemed important to acknowledge and document. Positioning context as an overarching theme allowed for a more accurate reflection of its significance. The loose hierarchy that followed identified a range of implicit or underpinning educator interpretations and assumptions regarding children's thinking as well as a series of explicit teaching practices informed by these presumptions. Finally, the outcomes of these assumptions and practices are described.

Figure 1. Conceptual Framework

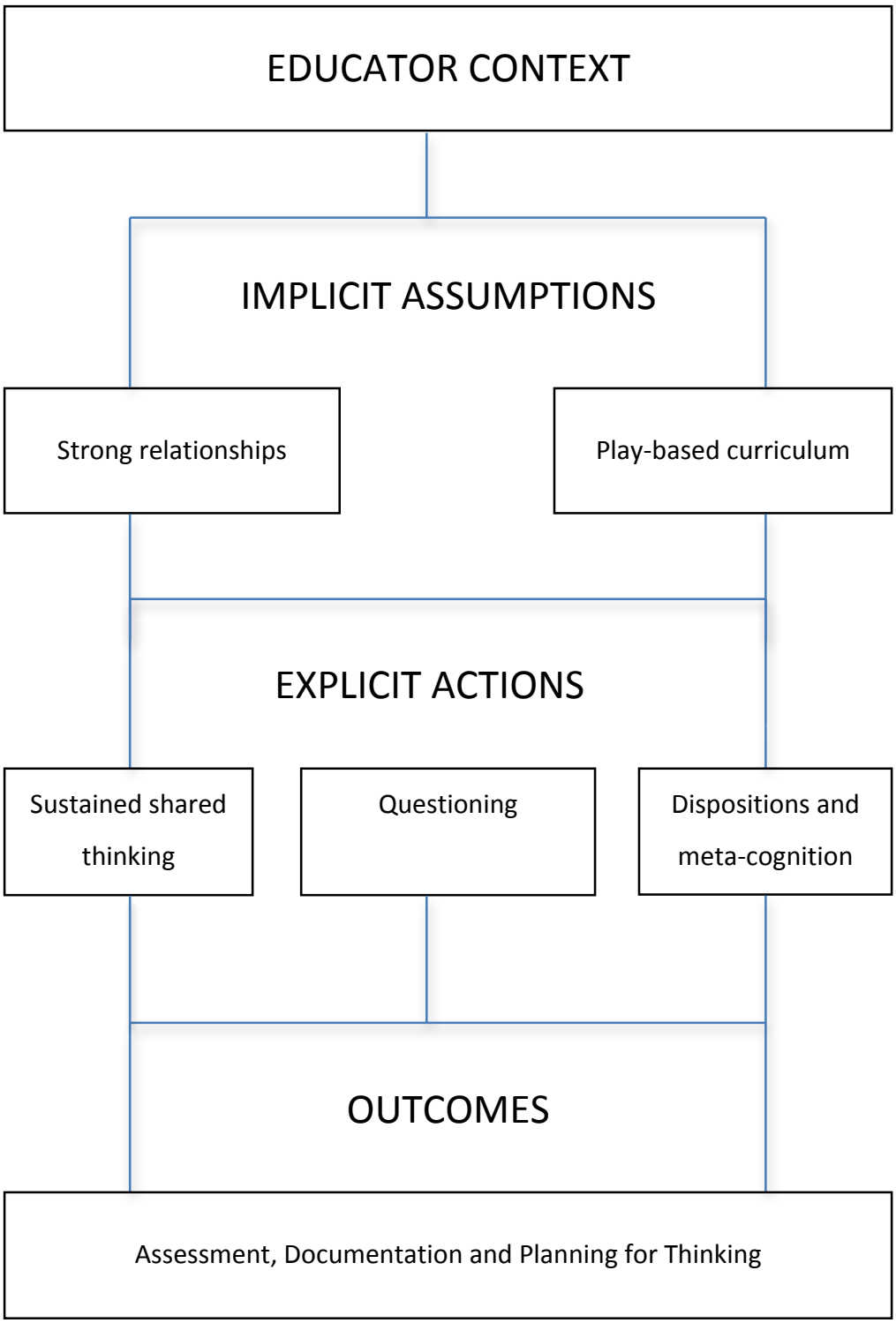

Figure 1. A thematic representation of the educators' understandings of children's thinking that incorporates teaching responses and outcomes.

4.2 Educator Context

Educator context is the term chosen to describe the background, circumstances, views and beliefs underpinning the practices and actions of each educator. By situating the educators within their particular context a more authentic understanding of their educational decisions and responses was facilitated.

Owen – intuitive and organic

Initially a volunteer and casual educator in the ECEC sector, Owen also worked for a brief period in outside school hours care. In 2005 he secured a contract as an ECEC educator and 11 years later he remains employed by this service. The centre's promotion of a natural and relaxed learning environment was noted as a significant and ongoing attraction. Owen reported his highest qualification as a recently acquired early childhood diploma. Asked to describe his primary focus when planning for thinking Owen reflected a moment then answered:

> *To push* [children's] *knowledge base and get them to lead where it's going. Quite often…I personally can see a better way for them to do it. And there is a struggle sometimes not to say "What about this way?" I really try to let them lead their own process... Maybe if they go through three times, I might give them a little bit of a hint or maybe say "What about if you try this?"*

When asked about higher-order thinking he responded:

> *Thinking is a bit of an abstract thing. It pretty much boils down to: don't look at something for what it is, look at it as what else it could be…I find it very difficult to encourage or sort of set up those* [thinking] *moments for them. It can literally happen from anything out there and you just have to be ready to catch it when it does because they're very difficult to get because they're so abstract. You don't ever know what's gonna trigger those deep thoughts.*

Site observations were consistent with stated views. Provided with relatively unrestricted access to open-ended resources within natural environments, children were supported to explore, experiment, test ideas and develop solutions to their own problems or interests. On each visit Owen was observed with a small, fairly consistent group of children, engaged in child-led experiences lasting at least an hour. Interactions were almost exclusively outdoors, even when lightly raining. A range of props was made available in an area supportive of their use. Real tools and resources (not toy versions) aided children's investigations. Teaching interventions did not dominate; information to increase understanding and thinking complexity was provided only when a child struggled for a prolonged period. There was much child-to-child discussion, often involving complex reasoning. During sustained interactions Owen focused almost exclusively on the small group who appeared to enjoy his organic and intuitive approach without concerning himself with others in the larger group. His stated reasoning: children's choices need to be respected.

Whole group experiences were not common and witnessed on only one occasion. Small group play opportunities (e.g. sand play, drawing table, climbing net and equipment, dirt area and dramatic play spaces) were always available. Few educator changes in materials and resources were made between visits with children given considerable freedom to determine what they might, or might not, add to their experience.

Andrew – systematic and inclusive

Andrew acknowledged multiple influences in refining his ideas, including a varied work/study history featuring an environmental science degree and hospitality management. The 13 years he spent working in early childhood special education were noted as particularly influential. A belief in the rights of all to skillful teaching became entrenched during his time working with children struggling to remember and understand simple concepts and/or mentally manipulate information to think at more complex levels. A comprehensive and systematic range of strategies was

deemed useful: play-based learning; ongoing vigilance to avoid missing moments of 'learning' importance; multiple reinforcement techniques subtly woven into teaching interactions; direct and indirect support for dispositional and meta-cognitive thinking; and, interest-driven planning were all mentioned.

Andrew identified his primary focus when planning for learning as child interest. When asked his definition of thinking he pondered awhile before offering this response:

> *How children process information and then relay that to their play, to their peers socially, to other adults in their environment, and then also, I guess problem solving using that information…There's the concrete type of thinking and also abstract thinking…* [and] *how children use their working memory…I always try to start with something concrete. Whether that be visual cues* [or] *actions and then we extend from there onto things more abstract, things that they can't see, things that they might not be fully familiar with.*

Site observations accorded with these views. Andrew's learning program was play-based with children free to choose from a variety of learning areas resourced according to interest (e.g. drawing area, collage, construction). Andrew regularly moved between individuals and groups. During small group experiences an oft-noted teaching strategy involved working concurrently with children with learning need variations in an orderly and unflustered manner. Whole group experiences lasting 30 minutes (sometimes more) were a consistent feature. Regardless of interaction type, a deliberate focus upon intentionally 'teaching' concepts underpinning children's interests and ideas, and a range of meta-cognitive skills that might assist children to remember, understand and apply this information, was repeatedly observed. After only four site sessions, a number of concepts had been accentuated during teaching moments: mathematics (1:1 correspondence, addition, subtraction, identifying and categorizing shapes and sizes); science and nature (how camouflage works, role of skeletons and animal categories); and,

language and literature (titles, authors, illustrators, page numbers, types of books and index details).

Katelyn – nurturing and creative

Katelyn described working as a nanny while completing a fine arts/teaching degree. Realizing early in her art teaching career that she preferred the more nurturing, creative and holistic play-based approach associated with the early years, she moved exclusively to early childhood education. During this period she gained an early childhood diploma. When questioned about higher-order thinking Katelyn answered:

> *I have taken my approach in art teaching in secondary…I personally believe it doesn't support the broader range of thinking and learning of a child…My role is to look at the child's interest, look at their strengths, and having an understanding of how they see the world and then offer them the scaffolding, offer them the steps to get them to develop an understanding and a knowledge and …I try to offer different little angles of seeing things and interpreting… I think by sharing and being open with that, it helps other children construct learning and knowledge.*

Site observations reflected Katelyn's experiences and perspectives. When entering the preschool room the attention given the visual impact of the physical space was immediately apparent. Displays of the children's work were creatively exhibited with precisely typed, often framed, descriptions alongside thoughtfully sourced and positioned artifacts designed to invite investigation. Specific projects spotlighting major artists like Picasso and Pollock were a feature. A rich variety of art experiences was evident (e.g. clay, charcoal, pencil, paint). Apparent also, was Katelyn's art expertise: intricate clay sculptures and paintings showing children's explorations of a technique made possible through high quality art resources and knowledge captured attention.

Katelyn had a set but flexible learning program encompassing indoor and outdoor

experiences. Formal group times took place on each visit. During indoor free play children engaged in experiences where the addition of artifacts linked to a previously explored interest were common. Presented with great attention to aesthetic appeal, the result was an enticing array of innovative play spaces. Outdoor play seemed less curated with children free to explore more openly. Except for formal group times Katelyn moved regularly between individuals and groups. Her focus on accepting and nurturing each child within an environment privileging artistic appreciation and creative possibility was a notable feature of her intentional teaching.

4.3 Implicit Assumptions

Implicit assumptions describe certain understandings that are so thoroughly integrated into a body of knowledge they do not require articulation or clarification. They are 'givens' unconsciously informing the processing and prioritizing of information (Frensch & Rünger, 2003; Deroost, Vandenbossche, Zeischka, Coomans & Soetens, 2012). Based upon this definition, two key educator assumptions emerged: a play-based curriculum and a relational pedagogy. When questioned about these assumptions educators were unequivocal regarding their importance. Each considered them the foundations upon which their explicit teaching actions were based.

4.3.1 Personal Relationships

The first of five principles outlined in the EYLF focus upon the importance of "secure, respectful and reciprocal relationships" (DEEWR, 2009, p. 12). The view that educators who nurture and sustain such relationships create emotional spaces that support the development of trust and overall wellbeing, while concurrently freeing children to concentrate upon exploration and learning, is actively promoted by the document.

When questioned about the importance of relationships when planning for

thinking all educators assumed them to be a critical component. Katelyn's words typify educator sentiment:

> *It's everything. You have to have a strong connection…you have to have that foundation. That comes through communicating with the family and really observing a child. Like at times just being quiet and watching the body language, their own language, reading their eyes and how they interact…It's a kind of a little intricate pattern of putting all these things together.*

Despite consensus regarding the centrality of strong relationships, unique practical interpretations were evident. Each educator built and maintained relationships according to their preferred style. Owen's partiality for responding 'in the moment' is unmistakable in this interview excerpt that describes how he abandoned a teaching intention when a relationship need appeared more compelling:

> *You have to take the time to know them and just sit there and chat. No learning outcomes expected. You just sit there; you just talk about whatever…Quite often I'll bring the mats back and I'll just lie there and they'll come and sit with me... and we'll just talk…Yesterday we were doing it… talking about the birds and trees and the bees…What do you reckon it would be like if you were as big as an ant?*

Notwithstanding Owen's intention to put aside formal learning expectations, his interactions incorporated opportunities for higher-order thinking. By supporting the children to imagine their world through 'ant eyes', Owen encouraged them to think beyond mere recall or demonstration of factual understandings. Instead he facilitated a sophisticated analysis linking known knowledge with imagined possibilities.

Andrew however, utilized a carefully calibrated and inclusive approach that

consciously broadened teaching aims. Relationship goals were woven into teaching occasions and ascribed equal importance. Referring to a language group experience featuring a singing rhyme containing significant personal detail about every child, Andrew explained:

> *It gives each child an understanding they're an individual and there is something very special about them. It also tells the rest of my team what a particular child's interest may be for the day or for the week, and it's also telling [each child] "Oh, they've got peers as well." What that child is interested in and what sort of play could be generated from that. It also starts to develop, I think, connections. You know, if I wanna talk about boats "Oh, I've got a boat at home. Dad's got a boat" or something like that.*

Not only was each child included in the recalling of details related to their lives, Andrew gently guided them towards higher levels of thinking. The process of reflecting upon others 'stories' and making connections to their own, required mental manipulations with the potential to stimulate alternative ideas and richer play interactions or conversations. By explaining possible benefits to other staff, the wide lens Andrew applied to planning intentions was on display.

Katelyn privileged different factors. Her focus upon building supportive relationships within an innovative environment ensured highly individualized educational responses designed to bolster both wellbeing and learning. Having become alert to one child's subtle behavioral cues and personal patterns, she suspected a keenness to participate in the art program despite protestations otherwise. Working indirectly and imaginatively she developed a series of experiences profiling artists using non-traditional techniques to promote this child's understanding of innovative art concepts and their practical application, as well as remove an emotional barrier preventing wider learning participation:

> *…He would never approach the art table because he couldn't draw*

> *anything…it didn't look like anything. He'd be like, "No. I can't do that… He didn't quite come on board with Matisse, but then he started to look at some of the Kandinsky work and he began to draw the lines and fill in the colours. And then that's when I went to Jackson Pollock for him, and he was one of the first children who really got into it.*

Three educators, each one firmly embedding relationships in their overarching strategy, yet with no clear commonalities regarding preferred technique. While not the core focus, higher-level thinking occurred nonetheless.

4.3.2 Play-based Learning

Play settings where educators plan for the sustained cognitive engagement of children have long been associated with superior learning outcomes in children (Siraj-Blatchford & Sylva, 2004). Educators promote these outcomes by joining in and provoking intellectual challenge (direct response) and/or structuring a play space to support thinking (indirect response). The EYLF (2009) promotes play as the context best suited to "expand children's thinking and enhance their desire to know and learn" (p.15). Unsurprisingly all educators presumed play to be an integral element of learning programs designed to support thinking.

Initially a limited range of educator-facilitated play-based experiences linked to learning areas common to each service was located (e.g. drawing, construction, collage, puzzles, dramatic play, outdoor play, whole group experiences). However, closer analysis revealed significant diversity arising from modifications to these areas by educators keen to supplement pre-existing knowledge and skill around a specific child interest. The educators often demonstrated considerable talent and enthusiasm in converting familiar service environments into innovative play spaces designed to extend interests. Examples included: a painting area transformed by Katelyn into a Jackson Pollock style experimental zone; the drawing table co-opted by Andrew as a stimulus space to investigate spiders; and, the outdoor shed area revamped by Owen into a construction site. Interestingly

the use of play-based experiences as a springboard for furthering children's interests did not necessarily include an extension to children's thinking, at least in any specific 'planned' sense. It was viewed as a 'by-product', albeit an important one, that might emerge during a play episode where a child was deeply engaged in experimenting with an idea, combining thoughts to trial an innovative proposition, conceiving and testing solutions to problems encountered and/or developing theories from cognitive actions. Katelyn's summation is indicative:

> **Interviewee:** Are there [thinking concepts] *that you have in mind that the child should be exposed to…?*
> **Katelyn**: *No*
> **Interviewer**: *It emerges?*
> **Katelyn**: *Yes. Yes. To me, it's a continuum. That's where I think as an educator, you have to look at something that is going to be seen as an essential skill* [and]… *find a pathway for that child to build that skill based on that child's interest*
> **Interviewer**: *What you are suggesting is that most of your energy as an educator goes into working out the child's interests, then weaving learning into that interest…*
> **Katelyn**: *Absolutely.*

Despite the observation that planning for thinking was often relegated to a secondary consideration, the educators showed considerable skill in maximizing the thinking potential within interest-led play situations. And while links between previously acquired knowledge and progression in comprehension complexity were limited or serendipitous in both planned experiences and spontaneously occurring teaching moments, thinking was supported and extended by the educators.

In the following example Andrew's methodical technique, designed to maximize learning opportunities for all, is discernable. Even though the experience was planned, the children responded differently, resulting in Andrew skillfully

calibrating his input to the individual interests and thinking levels of each child in an intricate 'teaching dance' that seamlessly incorporated all involved. Set in the drawing area where extra stimulus materials had been added, including reference books linked to the children's current interest in spiders and insects, the following excerpt showcases Andrew's teaching strategies:

1. **Andrew**: *Lots of circles, around and around and a red stripe here…or if they're baby red backs they have – what colour is their back? The baby ones? Juveniles?*
2. **Child A**: *Orange.*
3. **Andrew**: *The baby ones have an orange stripe and the adults have a red stripe.*
4. **Child A**: *Yeah. There, is it?*
5. **Andrew**: *There it is. Yup. And that's on page number 169* [points to page number].
6. **Child A**: *We should write that.*
7. **Andrew**: *Alright.*
8. **Child A**: *So 169* [child laboriously writes this on his piece of paper].
9. **Child B**: *Well I need only one* [pointing to a wing image he is trying to replicate].
10. **Andrew**: *Well looks like one there and one at the back* [2 wings]…*Let's have a look at it* (focuses attention on the image Child B is wanting to draw). *Let's do your pointing finger like this* [assists Child B position finger while referring to picture on writing table that shows the finger position].
11. **Child A**: *Andrew, Andrew, this is a spider, and there's a tiny spider. There are heaps of tiny spiders and heaps of big spiders* [points them out in reference book].
12. **Child C**: *And I did the red mark, I did the red one* [a 3rd child drawing spider image].
13. **Andrew**: [Returns attention to Child B and re-describes shape movement while referring again to reference book] *Over and around, over and around.* [Turns to Child C] *Good idea, the red one is the adult.*

14. **Child A**: *What this is* [pointing to words under picture]?
15. **Andrew**: [to Child B] *Again, over and around.* [To Child A pointing to words in reference book being referred to] *That's says… female huntsman.*
16. **Andrew**: [Returns to Child B] *Over and around…Hey, that looks pretty good! Yes, over and around. And for some reason it's got green on it. We talked about camouflage, didn't we? 'Child A' knows about camouflage.*

In exchanges 1 to 8 Andrew's intentional teaching was focused upon interest: identification of spider's ages according to the colour of their back; the introduction (or reinforcement) of the word "juvenile" to refer to baby spiders; and, the highlighting of page numbers as reference markers. By implanting these ideas into the conversation Andrew deftly reinforced conceptual understandings that might inform more complex thinking. This occurred for Child A, who was immediately alerted to the possibilities inherent in identifying page numbers. Not only did he see the benefits in recording page number 169, he went on to copy a long list of page numbers linked to his favourite images for later reference, a process he shared (after encouragement from Andrew) during a group language experience, thereby expanding learning potential even further.

In exchanges 9 to 16 Andrew worked with Child B to assist him to better appreciate how to approach a drawing task. Describing the different directions of lines representing the image while modeling movements with his fingers, Andrew supported the child's replication attempt of a tree insect by rendering visible (verbalizing) the learning steps or meta-cognitive thinking required to complete the task. When completed to the child's satisfaction Andrew inserted a conversational 'aside' that introduced the concept of camouflage, another learning possibility. As the drawing segment proceeded, Andrew concurrently reinforced the learning of others: Child C (exchanges 12 and 13) and Child B (exchanges 11 and 15), in the process displaying his preference for a learning strategy in which no one is overlooked.

Play-based learning in which thinking emerges from children's interests was

shown to be multi-layered, complex and highly individual, both at the lower levels of facts learning, recall and understanding as well as at higher levels involving linking, applying and creating ideas as well as hypothesizing and experimenting with possible solutions to problems encountered. While the chosen example demonstrated Andrew's unique style of fostering thinking through interest-led play, the other educators were similarly focused.

4.4 Explicit Actions

Explicit knowledge is based upon implicit understandings. But rather than residing primarily in the subconscious mind, it is openly articulated and consciously enacted (Collins, 2010). This definition assists in making sense of the range of deliberate educator actions designed to support thinking that were witnessed during observations and discussed during interviews. These 'actions' converged into three discrete and overarching themes: sustained shared thinking; questioning; and, dispositions and meta-cognitive skills. Findings are presented using this thematic framework.

4.4.1 Sustained shared thinking (SST)

Despite the widespread promotion of the concept of 'sustained shared thinking' within the ECEC sector (Siraj-Blatchford, 2012; Brodie, 2014; Purdon, 2016), it was interesting to note that none of the three educators was acquainted with the term. However, the engagement of the educators in actions fitting the definition suggested they were familiar with the key components of the strategy. Indeed, all were regularly observed interacting with individuals and groups "in an intellectual way to solve a problem, clarify a concept, evaluate and activity, extend a narrative" (Siraj-Blatchford et al., 2002, p.9).

Multiple instances of educator scaffolding of children's thinking during sustained interactions were recorded at a simple level (remembering and/or understanding) and more complex levels (applying, analyzing, evaluating and/or creating). Higher-

order thinking most commonly occurred when children encountered problems during an extended play experience that led them to inquire, experiment, test hypothesize and generate solutions and/or theories. Each educator actively supported these moments by resourcing play environments and engaging in extended conversations and questioning designed to highlight, provoke or refine thinking. The following example featuring Owen personalizes these SST strategies:

> A selection of real plumbing supplies (not toys) and water containers were simply placed in piles on the floor by Owen. No initial directions were provided either verbally or via equipment placement. Those involved, a small group of approximately eight children, appeared unflustered by the lack of structure. Nor were they fazed by the consequences of large-scale indoor water play: wet clothes, slippery floors and sodden towels were calmly accepted as expected outcomes, easily managed. Owen's unhurried and un-harried approach is highlighted as he supported the thinking of a child grappling with an unstable pipe structure during a sustained two-way interaction
>
> 1. **Owen**: *How can I make it not wobble?*
> 2. **Child**: *This…this sticky tape* [it was actually masking tape].
> 3. **Owen**: *You think I should sticky tape it?*
> 4. **Child**: *Yeah.*
> 5. **Owen**: *Sticky tape it to what?* [Waits while child considers]. *Will we sticky tape it to this* [tablecloth] *or the table itself?*
> 6. **Child**: *Maybe* [table]…*cloth seems to not stick.*
> 7. **Owen**: *So we take it off* [the cloth] *and stick to this* [the table]?
> 8. **Child**: *Yeah.*
> 9. **Owen**: *If I hold it, can you tape it?* [Child then spends several minutes cutting and positioning tape without assistance].
> 10. **Child**: *It's not working…*[the pipe still wobbles precariously].
> 11. **Owen**: *Alright. Well, why do you think it's not working?*
> 12. **Child**: *Maybe because its not sticking off a bit* [points indicating

tape too short to reach table].

13. **Owen**: *Yeah. Maybe. If we tried a new bit...* [Waits. Child picks up tape dispenser. After struggling Owen offers to hold dispenser while child pulls]. *You pull it a little bit more? Yeah, a bit more! Pull! Pull!* [Watches without commenting while child cuts and re-positions the longer piece].
14. **Child**: [Stands and looks at slightly more stable structure]. *Yep. That would work.*
15. **Owen**: *Well, can I pour some water in now?*
16. **Child**: *Yep!* [Pours in water than runs to end of pipe]… *It's working!*

Not only did Owen engage in a collaborative and intellectually focused interaction over a sustained period in order to address a dilemma of relevance, the strategies he incorporated to intentionally and skillfully extend the level of thinking (e.g. open questioning, working from existing knowledge base, co-construction of knowledge, provision of appropriate resources) were those associated with SST (Siraj-Blatchford et al., 2002; Sylva et al., 2004).

Determining whether the child possessed a basic comprehension of concepts necessary to resolve the 'pipe dilemma' is ascertained through Owen's open question in exchange 1. Having confirmed the child appears to understand that tape can secure objects, and that his pipe system requires gravitational forces to direct the water downwards to the intended site, Owen co-opted a practical experience not previously encountered by the child to support him link these ideas. Exchanges 2 to 16 spotlight the techniques utilized: a subtle blend of closed questions combined with significant 'wait-time' for thought processing and the sharing of ideas; a genuine respect for the child's suggestions; an ability to discern and ignore non-critical detail ('sticky' instead of 'masking' tape); and, a relaxed confidence in implementation attempts, even when less than optimal.

It is acknowledged that effective learning in SST settings can occur where there is a blend of "open-framework, free play opportunities with more focused group

work involving some direct instruction" (Siraj-Blatchford et al., 2002, p. 56). Certainly there were occasions during sustained interactions when the educator 'taught' information to facilitate a progression or overcome a 'roadblock' in a child's thinking. While direct teaching strategies were observed less frequently than other forms, they were nonetheless an important component. The following example occurred during a conversation about a dinosaur collection belonging to one of the children:

1. **Andrew**: *Where is the orange dinosaur made? Where was it made?*
2. **Child**: *Ah. They, they, they come from Woolworth's, but they might get made from the factory.*
3. **Andrew**: *They might. Could I have a look please at the orange one? The tag on it tells us which country they're made in. This one says 'made in China'... We'll have a look at the map later and see where it's made.*
4. **Child**: (selecting another creature) *Where has this one been made?*
5. **Andrew**: *Let's see. This one says, 'made in China'.*
6. **Child**: *China. I wonder where they are made* [pointing to another creature]. *China?*
7. **Andrew**: *I'm not sure. Oh let's have a look…Okay. This one says, 'Made for Woolworths, made in Ch –'*
8. **Child**: *China.*
9. **Andrew**: *China. So, all of these are made in a huge country called China.*
10. **Child**: *Maybe these can be made somewhere else.*
11. **Andrew**: *Oh maybe. I wonder why so many things are made in China?*

Working spontaneously to adjust teaching strategy in relation to this child's interest in dinosaurs, Andrew appropriated an opportunity to expand upon the complexity of thinking without interrupting the two-way nature of the conversation and the systematic approach he prefers. During exchange 1 Andrew

posed a question to gauge pre-existing child knowledge. Ascertaining considerable understanding (exchange 2), he introduced the concept of product labels and information they convey (exchange 3), particularly country of origin details. He then further extended thinking potential by making a connection to maps. Throughout the exchange the child's dinosaur interest remained central: Andrew appeared to commandeer the child's enthusiasm and use it in a coherent and ordered manner to link pre-existing knowledge to new but related information involving more complex and, in this instance, abstract thinking.

Subtle differences in the children's interactions with each educator were noted. Katelyn's presence was integral during sustained interactions. The children regularly solicited her physical presence and overt reinforcement. However, with Owen and Andrew this was less evident. At Timber Grove particularly the children frequently sought and provided input to each other without reference to Owen:

> **Child A**: *That's called a claw hammer, did you know, Tim?*
> **Child D**: *I've got a hammer. I hit some more…*[hammers vigorously on box].
> **Child A**: *It's not gonna go in. Tim, if you want, I can help you.*
> **Child D**: *No, I don't need any help. I just need to take all the screws out.*
> **Child C**: *Here's a screw* [picks one up from ground].
> **Child A**: *Actually, I can take them out for you.*
> **Child C**: *Yes. Yes*
> **Child D**: *No.*
> **Child A**: *If you want, I can.*
> **Child B**: *No. Aaron's gonna do it…*

The children's confidence in confronting and potentially resolving their concerns without the presence of an educator not only allowed Owen greater freedom in determining scaffolding effort, it indirectly reinforced children's thinking agency. Dispositions associated with positive learning outcomes such as collaboration and persistence were also supported.

4.4.2 Questioning

Questioning has long been considered a core skill of educators in encouraging children's thinking. Open-ended questioning particularly has been correlated with better cognitive achievements (Wittmer & Honig, 1991; Siraj-Blatchford et al., 2002; de Rivera et al., 2005; Youngju, L., & Kinzie, 2012). It was not surprising therefore that all educators considered questioning an integral component of teaching sessions, whether planned or unplanned. Except for group experiences, educator questioning occurred within play-based experiences in a range of existing environments, often modified by the educator to align with children's interests.

Three simple definitions of commonly observed questioning types were utilized. Closed questions were construed as those requiring 'yes/no' replies or pre-determined answers along with a corresponding association with lower level thinking; open questions were those requiring expanded answers with multiple possibilities (none predetermined and usually linked to greater thinking complexity); and, rhetorical questions were those worded as a paraphrase or where no answer was necessary. With these categories informing coding, a range of questioning featuring open, closed and rhetorical options was uncovered in all cases. Selection appeared to be based upon 'moment to moment' assessments of learning interactions, with questioning strategy constantly tweaked according to the child (or children) and the learning context in order to prolong attention, direct focus, gauge understanding, promote thinking, distribute attention and manage group dynamics.

In this example Owen's open question provoked solution exploration by two children working with plumbing supplies in a stream under a bridge:

1. **Owen**: *How we gonna sort out this ant problem?*
2. **Child A**: *Well, we could drain some poison there.*
3. **Owen**: *Well, that would work, yes. Do you think putting poison*

there would be safe?

4. **Child A**: *No*.
5. **Owen**: *No. So, we might need to think of a different way. 'Cause that would work but…* [Owen redirects his attention to another].
6. **Child A**: *What about we try and wash them into there?* [Points under bridge to Child B].
7. **Child B**: *Want water?*
8. **Child A**: *We could wash them out with water into the drain here. Well actually, I have an idea. What about we wash them into the drain thingy? Yes! Actually, let's do that* [*both attempt this process*]*. Still lots of ants. Down in the swimming pool in there.*
9. **Owen**: [returning his attention] *This is a bit of a conundrum isn't it?*

The level of child language input was considerable. Spoken contributions and controlling moves from Owen were limited, a strategy that seemed to assist child 'ownership' of the thinking processes being investigated. There was a considerable time lag between Owen posing and clarifying the question (exchange 1 to 5) and re-intervening (exchange 9). This appeared to support Child A engage in hypothesizing and trialling possible solutions unimpeded by pressure to locate a 'correct' answer (exchanges 6 to 8). Owen's teaching intentions appeared organic: the co-mingling of question type, time lapses, educator language input and controlling moves, thinking intentions, child learning need and teaching style seemingly instinctual.

In this outdoor free-play episode Katelyn asked questions of several children interested in building a lizard house:

1. **Child A**: *Those stepping-stones would be good.*
2. **Katelyn**: *The stepping-stones? We can have a look at those* [moves to look with child]. *How are we going to* [do this]? *Would you like to come and we'll have a few tries and see what works best? Would you like to try…?*

3. **Child B**: *There's a lizard in there.*
4. **Child A**: *I wanna use those* [stepping stones].
5. **Katelyn**: *Do you wanna use those? That's a good idea. What would you like to do with this one? Would you like to use this one for something? And we've got Leila, she's got the door.* [*Leila corrects teacher*] *I'm sorry, the wall. Where would you like to put your wall? Would you like to add to Jessie's or would you like to keep building a house around, make a bigger house?*
6. **Child B**: *I put…building a house around*
7. **Child A**: *Katelyn, Katelyn, I'm gonna go over there* [moved on from stepping-stones].
8. **Katelyn**: *Okay. Jessie's had* [*another*] *idea and he's going to be back with his idea.*

After presenting an open question requiring complex reasoning (exchange 2, line 2), Katelyn immediately followed with several closed questions before the child had time to ponder possibilities. With no fewer than five closed questions posed (exchange 5) before an answer was proffered, this high level of educator control may have constrained time for reasoned thought and child ownership of thinking. Yet before reaching conclusions regarding a missed opportunity for higher-level thinking through limited 'wait-time' and significant verbal input, Katelyn's teaching intentions and style require consideration. Shared later, Katelyn noted that Child A shied away from groups, so her goal for this child was to maintain participation and support wellbeing, rather than foster complexity of thinking. In this instance the intersection of multiple factors highlights an 'educational reality' related to question selection, 'wait-time' and educator input, as well as teaching intention, child need and personal style: goal prioritization is a complex and moment by moment decision-making process.

While open-ended questions featured in the interactions of all educators, most questioning was closed or rhetorical. In this example, Andrew's use of non-open questioning to augment his teaching intentions is examined:

1. **Andrew**: *Are big things always heavy?*
2. **Children**: *Yes.*
3. **Child:** *Bricks are heavy.*
4. **Andrew**: *Bricks are heavy. And are they big or small?*
5. **Child**: *And dinosaurs are heavy, too.*
6. **Andrew**: *Dinosaurs are enormous.*
7. **Child**: *How about little dinosaurs, are there heavy?*
8. **Andrew**: *I'm not sure. Now, let's see. This one is – is it big or little? What do you think?*
9. **Children**: *Big.*
10. **Child**: *Its not big as dinosaurs.*
11. **Andrew**: *I've got something else here* [retrieves very large air-filled exercise ball from resource room. Feigns struggling to hold the ball]... *It's enormous. It's huge. It's humungous. It's large. It's massive. Hang on a minute, which one's the bigger one?* [Points to small medicine ball and then the large exercise ball].
12. **Children:** *That one* [exercise ball].
13. **Andrew**: *This one. So, which one do you think is the heaviest?*
14. **Child**: *That one* [Points to air-filled ball].
15. **Andrew**: *So, I'm gonna move over to here* [Then passes both balls around the group. Each child experiences weight of both balls]…*and guess what, team? We didn't even drop it… Which one do you think was heaviest? Do you still think this one was heaviest?* [Air-filled exercise ball].
16. **Child**: *That's not heavy!*
17. **Andrew**: *It's not so heavy? So, this one's small and it's heavy* [medicine ball]. *This one's large and it's not heavy* [exercise ball.

The judicious use of closed queries allowed Andrew to quickly gauge comprehension as well as emphasize key points concerning the relationship between size and weight. Addressing conceptual gaps Andrew skillfully and sequentially combined closed questioning with concrete artifacts and clear

statements to increase the likelihood of understanding, in the process enhancing higher level thinking opportunities dependent upon this knowledge.

Despite the dominance of non-open questioning, educators demonstrated a marked hesitancy in ascribing benefits to the strategy. When asked about questioning they tended to default to a discussion about open questions. Moreover their perceptions regarding their preferred questioning style seemed misaligned to reality, at least in two cases. Owen felt he favored open queries, and while he used the technique with greater frequency than the other educators, he nonetheless asked more questions of the closed variety. Katelyn too noted a preference for open-ended prompts, however her impression was disputed by coding. Only Andrew's perception aligned with his actual practice; a blended approach featuring both open and closed questioning.

4.4.3 Dispositional Learning and Meta-Cognitive Skill

Many view specific abilities and skills as less critical than the disposition or inclination to utilize such capacity. Defined by the EYLF as "enduring habits of mind and actions" (DEEWR, 2009, p. 45), dispositions can be practiced and acquired, thereby increasing the likelihood of higher levels of thinking (Perkins, Jay & Tishman, 1993a, 1993b; Perkins et al., 2000; Ritchhart, 2001; Ritchhart & Perkins, 2008; Perkins, 2009; Costa & Kallick, 2008; Salmon, 2008, 2010; Salmon & Lucas, 2011; Salmon, 2016). The converse position is deemed equally true: that un-accessed or under-utilized knowledge can significantly impede thinking growth. Specific dispositions promoted by the EYLF include "curiosity, cooperation, confidence, creativity, commitment, enthusiasm, persistence, imagination and reflexivity " (DEEWR, 2009, p. 34).

All educators stressed the importance of dispositional learning. A range of dispositions was reinforced, however persistence, cooperation, imagination and curiosity were the most frequently promoted. For the most part, educators favored indirect strategies to facilitate and reinforce the development of

dispositions: dispositional learning was woven into other teaching interventions.

In the following example, Owen incorporated the disposition of persistence into a teaching interaction during an outdoor drawing experience by emphasizing the importance of trying, rather than succeeding. Also on display was Owen's view that the most effective learning emanates from personal 'struggle' and active engagement. This position aligns with findings of Carol Dweck (2006, 2008) who described learning benefits accruing to those who believe that knowledge is best obtained through ongoing challenge (i.e. a 'growth mindset') as opposed to those who hold a 'fixed mindset' in which intelligence is seen as pre-determined and largely unalterable:

> **Owen**: *I can try and draw a bunny.*
> **Child**: *No, you can't.*
> **Owen**: *I can try. You can always try. Sometimes you don't always succeed, but you can always try*.

During another teaching interaction featuring a child struggling to replicate a Mobilo construction design from a plan, Katelyn fostered the disposition of collaboration. Sensing the child's unhappiness and the blockage to his thinking, Katelyn sensitively modeled the process of sharing ideas and resources while subtly drawing attention to the benefits of a combined effort:

> **Katelyn**: *The blue piece...maybe you can help Max find the blue piece.*
> **Child**: *I have heaps of blue pieces.*
> **Katelyn**: *You have heaps? We have two blue pieces but we want a little* (one). *Oh look. Well done, Bailey. Bailey found a blue piece. We can use that one. There you go, Max.*

While broad behavioural tendencies like persistence and cooperation are considered important, another layer of dispositional thinking is deemed equally significant. Known as meta-cognitive awareness, it involves an ability to access

and apply helpful cognitive actions when carrying out a thinking task or challenge. When educators assist children develop a repertoire of these useful 'thinking steps' within an environment that fosters a culture of thinking, they are not only boosting their meta-cognitive awareness, they are also increasing the likelihood of higher levels of thinking (Costa & Kallick, 2008, Salmon, 2008, 2010; Salmon & Lucas, 2011; Salmon, 2016).

In this next example, Andrew indirectly emphasized meta-cognitive awareness and the disposition of curiosity while encouraging thinking within a group situation. By inserting the word 'wonder' (exchange 1), encouraging the exploration of multiple thoughts (exchanges 2 to 12), and using teaching pauses (exchange 6), he heightened inquisitiveness, encouraged the generation of ideas and indirectly supported the use of 'mindful' thinking or meta-cognition.

1. **Andrew**: *I wonder?* [After positioning storyboard, thinks aloud to encourage inquisitiveness].
2. **Child A**: *A spider!*
3. **Andrew**: *It's not a spider.*
4. **Child A**: *What is it?*
5. **Child B**: *Spider!*
6. **Andrew**: *Mmmmm…Let's have a look* [slowly turns board around].
7. **Child C**: *It's a sun.*
8. **Child D**: *Moon.*
9. **Child A**: *Hey! It looks like a 'J '.*
10. **Andrew**: *'J' for Jaden* [child's name].
11. **Children**: *Flowers.*
12. **Andrew**: *Oooooh. A little bit more information?*

Direct teaching of meta-cognitive processes was also a consistent feature of Andrew's practice. Particularly evident during teaching interactions featuring the phrase 'thinking brain', the strategy rendered thinking processes 'visible' in the hope children might develop a repository of helpful 'default' practices to be

drawn upon when pondering problems or ideas. The example below is indicative of this strategy:

> **Andrew:** *Handstand or cartwheel? Are you ready? Thinking brain on, in control, hands down and legs up. Feel your strong tummy and strong shoulders* [touches each as child executes the task], *and down in control* [as child returns to original position].

Andrew was the only educator to provide systematic opportunities for children to overtly reflect upon the thinking steps required for task completion. Given these skills seem likely to boost capacity for higher-level thinking as they provide a framework for children to 'self-talk' thinking actions when confronted with a challenge (Salmon, 2008, 2010; Salmon & Lucas, 2011; Salmon, 2016), this finding is significant.

4.5 Outcomes

While implementing the 'actions' deemed necessary to enhance the likelihood of high-level thinking, educators also completed a series of records considered essential in generating effective learning 'outcomes' linked to higher-level thinking. Records were focused upon assessment, documentation and planning for thinking.

'Assessment for learning' is one of the key practices outlined by the EYLF. It describes a cyclical process in which educators collaborate with families and other professionals in order to assess, evaluate and plan for learning. One of the primary purposes is to determine "the extent to which all children are progressing toward realizing learning outcomes and if not, what might be impeding their progress" (DEEWR, 2009, p. 17). Supportive interventions are listed as a suggested response for those struggling to meet outcomes.

Each educator participated in the 'assessment for learning' processes. Three main

forms of documentation were noted: a journal; child portfolio; and project documentation.

The purpose of journals was to provide a summary or overview of learning regarded as significant over a designated time period (in most instances a day). Given pressure to present information in a professional manner accessible to intended audience (parents) within tight timeframes, it was unsurprising that individual entries contained minimal detail.

In the following example Andrew recorded a focus upon triangles. Explicit details were absent. Instead the entry depicted how this broad focus was incorporated into multiple sessions and conversations, aligned to other learning challenges (transforming bodies into triangle shapes), and linked to an EYLF learning outcome. Andrew's preference for systematically presenting and linking information to maximize learning potential was displayed:

> Today we explored all things that were to do with triangles. Through conversations and group times the children were able to share their mathematical knowledge. As a transition, the children applied a variety of thinking strategies to solve how we use our bodies to make a triangle (Learning Outcome 4.2).

The principle way of collating detailed data on individual children's learning over time occurred through portfolios. A portfolio existed for every child. Each contained a collection of disconnected learning moments deemed significant by educators. All educators were involved in regularly adding portfolio entries, like this one from Owen:

> While outside today Oliver seemed to fall in love with the big climbing tree there. He spent very little time with his feet on the ground as he climbed and explored every inch of that tree. He would often call out to his friends and share interesting things he saw when he was up there… Oliver's

> exploration of the tree was a great way for him to explore and deepen his own knowledge and understanding of life in the bush. The smells, sounds, sights and feelings that he found on that tree all contribute to this connection to nature (Learning Outcome 2).

Written using an informal 'learning story' style and capturing Owen's preference for spontaneous experiences with few parameters, the entry was supported with photos, a learning outcome link and brief analysis. Identifying 'achieved' rather than 'planned for' learning, analysis was general: from the generically worded Learning Outcome 2, "children are connected and contribute to their world" (DEEWR, 2009, p. 25), to the loose connection with children's exploration of bush life. Although not evident, child interest 'drove' the described exploration with thinking situated within this context.

A third form of detailed documentation related to specific and enduring interests. Often labeled 'projects', this excerpt was written by Katelyn:

> **Artists in Focus**
> This morning during group time Katelyn introduced a new book to our room called 'Matisse's Garden'. The book explored the story of Henri Matisse and the delight of paper and how by cutting simple sheets of paper a world of possibilities could emerge. You were enthusiastic about exploring the book and could hardly contain your thoughts…"look it's a bird", "I can see a flower", "hey, that's a cat"...
> **Reflection**: putting ideas collected from the story into your own pictures we could see just how observant you are and how the shape and colours inspired you to create your very own masterpiece…

Written 'to' the children, explicit references to thinking were also absent from this portfolio entry. With learning attributed to 'children', the thoughts of individuals were absent. The reflection focused upon achieved outcomes with future thinking challenges undocumented.

Regardless of document type, recorded information related to thinking was mostly general and linked to interest. Thinking achievements tended to be broad statements or generic EYLF outcomes (DEEWR, 2009). Where future planning was mentioned, interest extension was the focus. Gauging and planning for children's developing understanding and ability to practically incorporate, analyze and evaluate specific mathematics, science, language and literacy concepts commonly associated with preschool development and the basis for much complex thinking, was not common, either for individuals or the group.

When asked about the thinking progression of children over time Katelyn wavered:

> **Interviewer**: *Would you be able to plot a progression in* [children's] *thinking?*
> **Katelyn**: *Yeah. I think you could. We do an overview of the child. So, their wellbeing, their sense of being connected… and we reflect on that child and how they see the world and their learning styles and their strengths…We use the framework* [EYLF] *to build a picture of how the child has progressed.*
> **Interviewer**: *And that includes the child's thinking?*
> **Katelyn**: *Well – yeah – I think in a subtle way – it's interwoven into it.*

The other educators vacillated similarly. Certainly thinking featured, however teaching strategy designed to methodically uncover or map specific thinking patterns or conceptual understandings over time, was neither described nor observed. Nor was there evidence that educators specifically reflected upon children's thinking progress as a learning accountability measure.

4.6 Summary

In this chapter a range of findings have been presented using the conceptual framework (Figure 1) that emerged during coding and analysis in order to accurately capture educator practice and belief. A number of key factors materialized, in the process allowing a more comprehensive understanding of the actual intentions and educational responses of educators when trying to support and promote higher-order thinking. The context of the educator, resulting in highly contextualized learning experiences, was critical. The assumption that relationships and play-based learning must underpin educational responses was not only endorsed by all educators it was evident in their practice. Explicit pedagogical actions featuring SST, encouragement of positive learning dispositions, and questioning were the principle ways in which educators attempted to promote thinking. Of particular importance to this study was the finding that, despite a series of records designed to assess, document and plan for more effective thinking being accorded high priority by all educators, planning for a progression in children's thinking complexity appeared more serendipitous than planned.

Chapter 5: Discussion and Conclusion

5.1 Discussion

The aim of the study was to investigate how higher-order thinking in young children was comprehended and promoted by three educators working in separate, highly rated preschool services. To this end, the study examined the educators' knowledge of thinking levels and how they applied to young children, as well as insights into their beliefs about possible factors influencing their practice.

The findings confirmed the importance of a range of factors discussed in the literature review, downplayed others, and highlighted several not previously countenanced. In this chapter the main findings are discussed and interpreted.

5.1.1 EYLF Alignment and Educator Context

A close alignment with the principles and practices articulated in the EYLF (DEEWR, 2009) became evident when educator responses were placed into a conceptual framework to concisely reflect the central themes that emerged during data collection and analysis (Figure 1). This synergy was particularly noticeable in the importance attributed to play-based learning, relationships, sustained shared thinking, open questioning, dispositional learning, and documentation. Considering the role that the EYLF plays in informing learning programs and associated compliance obligations in line with federally mandated legislation attached to the National Quality Framework (COAG, 2009), this finding was unsurprising.

Less anticipated, yet clearly relevant, were the nuanced differences evident in educator interpretations of the 'EYLF related' themes. The study findings do not support a common educator conception regarding the manner in which the agreed assumptions, actions, and outcomes outlined in the conceptual framework

(Figure 1) should support thinking. Instead, the subtle views and beliefs of the educators surfaced as powerful influence on their practices. The systematic, disciplined and multi-lens approach adopted by Andrew, the nurturing, sensitive and creative perspectives of Katelyn, and the naturally evolving and relaxed style of Owen, were all reflected in their practices. These differences appeared to shape the learning experiences for the children.

For example, during free play sessions designed to maximize thinking, the outcomes experienced by the children were quite dissimilar. Owen strongly privileged indirect teaching strategies and organically emerging opportunities. During each visit I observed his calm, often minimal, engagement for extended periods (often over an hour) with a consistent yet small group of children according to their interests at a point in time, and without reference to others in the larger group. With Andrew this 'laid-back' practice was far less visible. Instead, a series of methodical movements between small groups of children to ensure the inclusion of all were the norm. So too was a focus on both direct and indirect approaches featuring a blend of conscious instruction combined with reinforcement, encouragement of experimentation and ideas generation, and linking of thoughts to other moments in the day or week, other children's ideas, aligned concepts, and/or meta-cognitive skill. In Katelyn's case her deep sensitivity to each child's emotional needs, and the manner in which innovative learning environments might support their wellbeing while also encouraging learning, resulted in a range of creative responses in which thinking was embedded.

Without compromising the strong commitment each educator had to common core principles and practices associated with the EYLF, their individual beliefs and styles personalized their teaching strategies, which in turn supported children's thinking in very different ways. Each offered unique benefits, while at the same time hinted at possible limitations. Owen provided exemplary environments for active open-ended exploration, hypothesizing, creative response and problem solving within natural settings, but the primary beneficiaries were a small number

of children attracted to the freedom inherent in his approach. With Katelyn, her intense concern for children's emotional comfort and sense of belonging at times suggested that thinking opportunities were consigned a lesser status. Regarding Andrew, the busyness of a learning environment designed to include and link multiple thinking options while incorporating meta-cognitive strategy, may have unintentionally excluded those preferring a slower-paced and less focused strategy.

Such variations appear strongly related to personal style preferences and attitudes, a view supported by others claiming close links between educator beliefs and individual manifestations of teaching practices (Vartuli, 2005; Caudle & Moran, 2012). The implications for services, other educators and parents from possible stylistic clashes between educators and children were not discussed during this study, however a mismatch may well have learning implications. Saracho (2003) noted this possibility, along with the need to ameliorate impacts when planning and implementing learning experiences, when she located distinct differences in child comfort levels arising from educator/child incongruities. More recently, Trawick-Smith, Swaminathan and Liu (2016) documented learning improvements in the mathematical understandings of preschool children when educator interactions were a 'good-fit' with their choice of play activity.

5.1.2 Defining Higher-order Thinking

Of most significance to the aim of this study, educators struggled to define the term 'higher-order thinking'. Not only were explanations somewhat generic (e.g. abstract thought, processing and linking information, problem solving), each was hesitantly offered, suggesting limited previous consideration or uncertainty regarding interpretation. No mention of learning taxonomies (or the information on thinking complexity they describe) occurred. Given the term 'higher-order thinking' is omitted from the glossary attached to the EYLF (DEEWR, 2009), and specific details are absent from the body of the document, the lack of certitude may be the result of educators confining their professional vision to the scope of

the explicit content of this national curriculum resource. Perhaps educators are privileging the content of the EYLF in a way that renders invisible or irrelevant information not included in the document. Considering the close alignment between the EYLF-related principles and practice and the conceptual framework of the educators (Figure 1), the proposition that the restricted information provided may be constraining a more in depth educator knowledge and understanding is plausible. Cohrssen, Tayler and Cloney (2015) found significant levels of uncertainty regarding educator mathematical conceptual knowledge during their investigation of the mathematical experiences provided by a small group of ECEC educators participating in a large-scale Australian longitudinal study known as E4Kids that is examining the impact of ECEC programs on children's learning. Participants were unsure about what to teach and how to go about this. In their analysis of feasible reasons, the authors identified broad EYLF learning outcomes that provide insufficient information on learning targets and specific pedagogical strategy as a possible factor. With others also concerned about the impact of minimal EYLF detail upon teaching practice and knowledge (Cohrssen et al., 2013; Siraj, 2015), the likelihood that the rudimentary knowledge of educators related to higher-order thinking may be associated with the circumscribed detail contained in the EYLF cannot be ruled out.

Similarly, the high priority accorded learning taxonomies in the literature and school curricula (e.g. Bloom, 1956; Anderson et al., 2001; Biggs & Collis, 1982; Biggs & Tang, 2011; Board of Studies NSW, 2012), is absent in the EYLF (DEEWR, 2009). Indeed, taxonomies are not mentioned in the document at all. Any role they might have in assisting educators more effectively identify, assess, analyze and plan for higher levels of thinking is not countenanced, notwithstanding scholarly eminence elsewhere. While it could be argued that those with a pre-existing knowledge of taxonomies are supported by EYLF statements encouraging educators to "provide opportunities for involvement in experiences that support the investigation of ideas, complex concepts and thinking, reasoning and hypothesising" (DEEWR, 2009, p. 35), those without this underpinning understanding may struggle to extract meaning. Consequently, the fact that no

educator in this study directly or indirectly acknowledged the existence of taxonomies, or displayed awareness of the different levels of thinking they describe, seems unremarkable.

5.1.3 Planning for Thinking

The finding that no educator was specifically planning for a progression in children's thinking complexity is particularly significant in fully comprehending the practice and beliefs of educators in relation to higher-order thinking. While all were involved in scaffolding children's thinking during sustained experiences, they did so within the context of child interest. Rather than situating thinking growth 'within' a current interest, thereby enabling a progressive consolidation and expansion of thinking complexity regardless of present fascination, the interest itself was the primary focus, with any sequential growth in thinking a fortuitous by-product. In essence, thinking largely appeared to be a repercussion of the experience rather than the focus. The analysis of teaching interactions, as well as secondary source documentation, suggested that when a child's interest changed, in most cases so too did conceptual and thinking focus.

Like the restricted knowledge around taxonomies and higher-order thinking definitions, it may be the absence of specific or direct planning for a progression in children's thinking skills resulted from these educators confining their enquiries and actions to the explicit content of the EYLF. Information on thinking provided by the EYLF is sweeping and holistic, higher-order thinking is mentioned only once, and detail is excluded. Children's learning is viewed as ongoing and moving towards the achievement of broadly worded EYLF outcomes. This example is indicative: Children will "develop a range of skills and processes such as problem solving, inquiry, experimentation, hypothesizing, researching and investigating" (DEEWR, 2009, p. 35). Similarly vague, EYLF educator strategy includes suggestions like "model mathematical and scientific language…" and "provide opportunities for involvement in experiences that support the investigation of

ideas, complex concepts and thinking, reasoning and hypothesizing" (DEEWR, 2009, p.35). A non-linear learning pathway is also stressed.

A consideration of the views of several of the authors charged with writing the EYLF is insightful (Sumsion et al., 2009). In describing a completed document of many compromises necessitated by multiple policy and political considerations (e.g. compressed timeline, differing state viewpoints, complex decision-making structure, national consultation and a diversely qualified 'audience'), Sumsion et al., indirectly lend weight to the contention that, for some educators at least, there may be insufficient information to effectively guide their pedagogical practice. Despite the authors outlining an intention for the document to be deconstructed and analyzed by more highly skilled educational leaders who could assist in up-skilling those with a less established skill base, the extent to which this is occurring may be less than anticipated. Perhaps it is time to reconsider the contents and interpretations of the EYLF. Certainly the authors hinted at this necessity when they reflected that: "…for the EYLF to achieve its full potential…it must be a dynamic document that is subject to ongoing refinement" (p. 10).

Others too are documenting concerns regarding the manner in which thinking is interpreted and positioned within multiple expectations frameworks like the EYLF. The context driving concerns varies: worries about potential curriculum deficits or interpretation confusion (Tayler, 2014; Siraj, 2015); a focus on interests rather than ideas and thought (Harcourt, 2016); the possibility of limitations in educator knowledge leading to conceptual 'gaps' in children's learning (Siraj-Blatchford et al., 2002; Siraj et al., 2015; Birbili, 2015; Zhang & Birdsall, 2016); uncertainty regarding what children should be learning; and, challenges in being able to visualize a progressive or sequential approach to learning (Birbili, 2015). For the most part, this growing contingent is invested in re-imagining the way in which planning for thinking can occur within frameworks featuring multiple expectations without detracting from or removing critical factors. Specific areas like task focus, goal achievement, concept comprehension (particularly those related to science and mathematics), problem solving, and higher-order thinking (Birbili, 2013, 2015;

Tayler, 2014; Siraj et al., 2015) have been targeted for comment and/or ameliorative action.

5.1.4 Sustained Shared Thinking

While none of the educators was familiar with the term 'sustained shared thinking' (SST), the frequent engagement of the educators with children during sustained interactions involving two-way sharing of information and thinking (Siraj-Blatchford et al., 2002), suggests an understanding and appreciation of key SST elements. A positive outcome can be assumed, given the oft-cited link between SST and thinking gains (Siraj-Blatchford et al., 2002; Sylva et al., 2004; Siraj-Blatchford, 2009; Siraj et al., 2015). However, with SST interactions observed during this study concerned primarily with extending child interest, rather than planning for a progression of conceptual understandings and thinking growth (where 'interest' is the stimulus rather than end point), there may be a downside. Educators may be insufficiently mindful of individual children's current knowledge and skills related to thinking, and consequently, unaware of how this information might springboard further thinking gains. With recent findings from the federally funded E4Kids project reporting low levels of instructional support (Taylor & Thorpe, 2012; Tayler et al., 2013), and evidence of thinking gains from 'good-fit' instructional support expanding (rather than limiting) play and learning (Trawick-Smith et al., 2016), a focus upon interest without equal attention to thinking expansion and progression may be problematic.

5.1.5 Questioning

Claims associating open questioning with thinking expansion (Siraj-Blatchford et al., 2002; de Rivera et al., 2005; Youngju & Kinzie, 2012) were accepted by all of the educators, with two of the three indicating a personal preference for this style. Yet findings suggested otherwise. Not only were there more non-open questions posed, the conversion of many open queries into closed options that

negated the original expansive possibility, was noted. In interpreting this phenomenon several factors may be implicated.

Firstly, it is possible that educators were responding in an unconscious or automatic manner. Possibly the conversion of open requests into closed queries by educators with teaching intentions other than expansive thinking (e.g. the 'lizard house' episode in which Katelyn 'closed' an open question to maintain participation rather than deep thinking), were based more upon intuitive reactions to evolving situations rather than a deep appreciation of contingencies related to open questions. Perhaps there was only limited educator consciousness of thinking constraints resulting from: accepting only one answer to an open question thereby creating perceptions of 'correctness' rather than open possibility; countering an open question immediately with a closed one, in the process stifling thinking potential; and/or, utilizing controlling teaching strategies that subtly constrain free-ranging investigations and ideas generation (Siraj-Blatchford & Manni, 2008). Conceivably those occasions when insufficient time was provided after posing a question for reasoned thought, or scaffolding potential was restricted by leaving proffered answers unexplored (Cohrssen, Church & Tayler, 2014; Wasik & Hindman, 2013), were less the result of careful consideration than reflexive reaction.

Secondly, educators may be responding with full consciousness, but within the context of a constrained knowledge base. It is conceivable that the immediate countering of an open question with a closed question, or the acceptance of only one answer, may be a consequence of limited understanding of contingency factors rather than minimal reflective effort of the educators. This study raises the possibility that educator acceptance of the open-ended questioning technique as an effective stimulus for higher levels of thinking may be based upon a superficial understanding of the way in which it works to support enhanced thinking complexity. Based upon evidence from this study, a more robust educator knowledge and skill base around the use of such questioning seems likely to be beneficial.

Also a feature of educator practice was a circumscribed recognition of benefits associated with the use of non-open questioning in relation to higher-order thinking. Given the frequent use of this form of questioning, this finding seemed somewhat confounding. Reasons for the high use of non-open questions appeared to be varied. Certainly there were situations where closed questions shut down thinking opportunities. Yet there were times when closed questioning appeared to offer a quick way of discerning comprehension or highlighting a critical point. Such practices may alleviate some of the concerns raised by those identifying complex thinking limitations in areas requiring specific and explicit meta-cognitive processes and conceptual information (Siraj-Blatchford & Siraj-Blatchford, 2002; Salmon, 2008, Salmon & Lucas, 2011). On other occasions, the accommodation of different levels of child understanding and comfort in being cognitively stimulated seemed the primary motivation (Beauchat et al., 2010). However, educators were either hesitant to voice any thinking advantages linked to non-open questions, or were simply unaware such questioning might be augmenting their thinking goals. No doubt entirely consistent with educator beliefs about open-ended questioning already discussed, yet somewhat perplexing given the majority of posed questions were non-open in style, the undervaluing of the way in which less cognitively challenging questions might assist in the consolidation of conceptual knowledge and/or pave the way for questions requiring greater cognitive demands (Massey et al., 2008) is intriguing. As with open questioning, a more comprehensive educator knowledge base would seem desirable.

5.1.6 Dispositional Learning and Meta-cognition

The importance of dispositional learning to educators sits comfortably with EYLF advocated strategy (DEEWR, 2009). It also has substantial support from others who expand dispositional learning to include the related dimension of meta-cognition (Perkins, Jay & Tishman, 1993a, 1993b; Perkins et al., 2000; Ritchhart, 2001; Ritchhart & Perkins, 2008; Perkins, 2009; Salmon, 2008, 2010; Salmon & Lucas, 2011; Salmon, 2016). Yet there were variations in the extent to which

educator practice assimilated the view that thinking benefits can arise from the promotion of dispositions and meta-cognitive strategies designed to support cognitive capacity and efficient information processing.

While all educators showed considerable skill and ingenuity in weaving dispositional learning linked to mindsets like perseverance, curiosity and collaboration into their teaching practice, only Andrew demonstrated a conscious knowledge of, and skill in implementing, overt meta-cognitive awareness strategy. Akin to the 'visible thinking' approach recommended by Salmon (2008) and Salmon and Lucas (2011), who located heightened thinking acuity when meta-cognitive routines were built into the learning programs of preschool children, Andrew labeled his version 'thinking brain'. By providing opportunities for children to reflect upon factors impacting their growing knowledge, the 'mind-habit' of reflexivity, a disposition described in the EYLF as "children's growing awareness of the way their experiences, interests and beliefs shape their understanding" (DEEWR, 2009, p. 46), was also reinforced. Although Andrew did not mention this disposition specifically, he nonetheless engaged the children in visible thinking practices likely to augment its development. Neither Katelyn nor Owen conspicuously promoted meta-cognitive awareness or mentioned the disposition of reflexivity. While the study did not explore reasoning behind these absences, the potential for the accrual of significant thinking benefits arising from the conscious inclusion of meta-cognitive strategy by educators, particularly an enhanced ability to self-talk processes during a thinking task, appear significant.

5.2 Implications for Practice

The pedagogical decisions of the educators (captured in the conceptual framework) align closely with those outlined in the EYLF (DEEWR, 2009). Although no causal link is inferred, this synergy attests to the importance of the EYLF in informing and/or reinforcing educator practice. Whether the absence of specific assessment, planning and learning provision with a conscious focus upon an ongoing progression in the complexity of children's thinking (rather than an

extension of knowledge around a current interest) is an unintended consequence of educator allegiance to the EYLF, is beyond the scope of this study. However, it cannot be ruled out as a contributory factor. With suggestions of possible gaps in the way in which the EYLF supports children's cognitive development (Cohrssen, et al., 2013; Cohrssen et al., 2015; Siraj, 2015), and those responsible for the development of the EYLF intending for the document (and aligned interpretations) to be reviewed and updated (Sumsion et al., 2009), it may be time to reconsider how the EYLF might better support a progression in children's cognitive understandings and levels of thinking.

There are many possibilities that could be considered. For instance, the recently published SSTEW Scales currently being utilized in centres across England (Siraj et al., 2015) attempts to make cognitive development more explicit while continuing to reinforce social and emotional development. This scale weaves an evolving understanding of SST into a support document for educators, in the process creating a tool that can be used concurrently with other curriculum documents such as the EYLF. Not only is higher-order thinking and concept development made explicit, information guiding excellent practice describes a progression in thinking whereby children are assisted to consolidate previously encountered or emerging concepts through a range of intentional experiences featuring overt links between earlier experiences, knowledge and real life. Importantly, the SSTEW Scale continues to advance an interest-led planning process. For those worried that the actions and understandings of the three educators are indicative of a wider sector malaise concerning planning progressively for thinking, or who fear that "without some systematic tracking of learners educators cannot know whether their good intentions are being translated into the desired outcomes" (Carr & Claxton, 2002, p.16), resources like the SSTEW Scale may offer a way forward.

Enhanced professional support for educators could also be countenanced. Expressing doubts about the extent of learning improvements possible from a single national system like the EYLF, Tayler (2012) proposed locally calibrated

professional learning opportunities as a potential augmentative option. Citing Ball and Cohen (1999) who noted the absence of learning outcome improvements from affirmation and sharing dialogue between educators, Tayler described how contextualized professional collaboration and rigorous analysis of learning strategies and associated child outcomes led by highly experienced and knowledgeable educators can positively impact learning. Certainly the strategy seems worthy of further consideration.

5.3 Limitations and Future Research

The impact of the qualifications of the three educators upon their views and practices can only be surmised, as it was not the focus of this research. That all services chose diploma-qualified educators, rather than teachers with early childhood degrees, may be important. High quality ECEC learning programs are regularly aligned with degree qualified staff (Sylva et al., 2004; Huntsman, 2008), and there is a growing body of evidence indicating superior cognitive outcomes for preschool children when their educators possess higher qualifications (Sylva et al., 2004; Saracho & Spodek, 2007; Mathers et al., 2011; Nutbrown, 2012; Warren & Haisken-DeNew, 2013). The fact that two of the educators held degrees in fields other than early childhood along with their ECEC diplomas may be relevant. Perhaps a degree in any field provides a set of high-level transferable skills that, when combined with an ECEC diploma, produces a discernable boost in educator capability. Further research is needed to develop a clearer understanding of how and why qualifications levels may be associated with educators' understanding and teaching of higher-order thinking skills in young children.

Gender too may be meaningful. The possible relevance of two of the three educators being male was not addressed by the study. It is acknowledged that the ratio is at odds with the ECEC sector where less than 6% of educators identify as male (Productivity Commission, 2014b). Certainly there is a generalized belief in benefits for children having access to male educators, particularly in providing a balance of learning approaches (Owens, 2010; Nutbrown, 2012). And while

several studies report no significant differences in learning outcomes for children in relation to educator gender (Rose, 2009; Burusic, Babarovic & Seric, 2012), at least one other located gendered variations in the related area of play. Sandberg and Pramling-Samuelsson (2005) found female educators tended to privilege calm play and positive social outcomes, while males focused more upon actively 'doing things' with children, particularly in relation to physical play. With play-based learning the norm in the ECEC sector (DEEWR, 2009), this finding suggests further research is warranted.

The age of the child may also be implicated. The study did not investigate the views and practices of those working with infants and toddlers, however this information may have relevance, particularly given recent evidence of possible EYLF limitations in pedagogical guidance aligned to infant learning, and concerns the language used in the document provides the impression infants are "unable to communicate directly or engage in mental processes" (Davis, Torr & Degotardi, 2015, p.7).

5.4 Conclusion

In seeking greater insight into the practices and beliefs of three educators in relation to higher-order thinking, the present study uncovered strong links to the broad principles, practices, and outcomes described in the EYLF. On the other hand, views and ideas not countenanced or fully explored in the EYLF were paid little heed. In particular, the uncertainty displayed by the educators when defining higher-order thinking, and their disinclination to progressively assess, plan and report against children's specific thinking growth and level of complexity, appeared to reflect scope limitations of information provided in the EYLF. Perhaps the multiple expectations and holistic focus of the document further exacerbated this effect: with so many factors to consider, lost, obscured or generic thinking plans became a credible outcome. Concerned that the learning gains touted when introducing the National Quality Framework (COAG, 2009) may fail to materialize if the educators' responses uncovered in this study in relation to planning for a

progression in children's thinking complexity are indicative of others in the sector, a compromise position is advocated. One in which thinking is repositioned as a central concern of educators while maintaining the core elements of the EYLF.

Armed with a greater comprehension of how higher-order thinking is understood, implemented and sustained by the three educators in this study, doubts articulated by those troubled by low levels of instructional support linked to cognitively challenging experiences within ECEC services (Tayler & Thorpe, 2012; Tayler et al., 2013; Tayler, 2014) are both assuaged and reinforced. While exemplary practices observed in relation to higher level thinking will allay concerns for many, the absence of specific planning for a progression in thinking skills over time will alarm others, particularly those concerned by limited ameliorative options available to vulnerable children (Snow et al., 2001; Sylva et al., 2004; Snow, 2015; Cloney, Cleveland, Hattie & Tayler, 2016). This study argues against a binary position, instead advocating a synthesis in which the focus upon a progression in children's thinking growth is reclaimed and strengthened. Whether at a curriculum level utilizing complementary resources like the SSTEW Scale (Siraj et al., 2015) and/or through targeted and ongoing professional development (Tayler, 2012), the potential for a boost in educator capacity to promote a range of specific thinking skills and concepts necessary for engaging in more complex thinking, would seem a significant lure.

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Appendix A

Interview Schedule:

The interview schedule will form the basis of the initial interview with study participants to ensure broad coverage and consistency in issues addressed.

1. **Length of time working in the sector**

   How many years have you been working in the ECEC sector as an educator?

   a. 0-2 years
   b. 3-5 years
   c. 6-10 years
   d. 11-15 years
   e. Over 15 years

   Additional Information:

2. **Qualification of educator**

   What is/are your current 'educator' qualification/s?

   a. Certificate III
   b. Diploma
   c. Bachelor degree
   d. Post graduate degree

   Additional Information:

3. **Planning for Thinking and Learning**

Planning for Thinking

a. When engaged in educational planning for learning, describe your **primary focus**. Why is this your focus?

b. How do you **define** 'thinking'?

c. Are there **different levels of thinking**? Discuss.

d. Do you **plan for different levels of thinking**? Describe.

e. Do you utilize **questioning** to support children's thinking? Describe

f. Do you draw children's attention to learning **dispositions** in your interactions with children? Describe.

g. What is your understanding of **sustained shared thinking**?

h. Does **sustained shared thinking feature in your interactions** to support children's thinking?

i. Describe how your planning for thinking builds upon or extends **individual** child's thinking skill/s. What about **group thinking** skills?

Influences and Beliefs

a. Describe your **beliefs** about how children's thinking should be supported and extended

b. What influence do you believe the learning you undertook while gaining your **educational qualifications** has had on your views about, planning for, and interactions involving 'thinking'?

c. Have your views, planning processes or interactions with children related to 'thinking' **changed** since you gained your educational qualification? Why might this be the case? Possible prompts: TED talks, workshops, mentors

Appendix B

Final Interview Schedule:

The interview schedule will form the basis of the final interview with study participants in order to summarize information provided in earlier interviews and document any participant changes that may have taken place. Video footage from previous sessions may be utilized to trigger discussion.

1. Planning for Thinking and Learning

Planning for Thinking

j. During our 1st interview we discussed:

i. Your **primary focus** when planning for learning

ii. Your **definition of** 'thinking'

iii. Whether there are different **thinking levels**, and if so, how you incorporate them into your learning programs

iv. **Questioning** and how this features in your interactions and planning

v. **Dispositions** and how these might feature in your interactions and planning

vi. **Sustained shared thinking** and how this might feature in your interactions and planning

vii. How your educational planning for thinking builds upon and extends children's **thinking skill/s as individuals and/or a group**

Have you changed any of your ideas or practices since this interview? Discuss

Influences and Beliefs

a. During our 1st interview we discussed:
    i. Your **beliefs** about how children's thinking should be supported and extended
    ii. The influence of your **educational qualifications** on your views about, planning for, and interactions involving 'thinking'
    iii. **Other influences** on your views, planning processes or interactions involving 'thinking' since you gained your educational qualification

Have you changed any of your ideas or practices since this interview? Discuss

Appendix C

Child Informed Consent Script

INSTITUTE OF EARLY CHILDHOOD
Faculty of Human Sciences

MACQUARIE University
SYDNEY·AUSTRALIA

The following script will inform a conversation with each child in the preschool room to ensure their agreement in being involved as indirect participants in the above study.

Hello. My name is Judy and I will be visiting your centre to watch how your teachers work with you to help you learn and understand new things. To help me do this I will be videotaping your teachers and looking at the children's learning portfolios during my visits. Sometimes you will also be in the videos with your teacher. I might also want to look at your learning portfolio. Will that be okay with you?

Child Name	Verbal Agreement	Non Agreement	Date

Date _____ Director Name _____ Director Signature _____

Date _____ Researcher Name _____ Researcher Signature _____

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Appendix D

Educator Informed Consent Form

INSTITUTE OF EARLY CHILDHOOD
Faculty of Human Sciences

MACQUARIE University
SYDNEY·AUSTRALIA

Title: A Case study: How is higher-order thinking in young children understood, supported and sustained by educators within three preschool settings?

You are invited to participate in a case study that will commence in your centre in late September 2015 and complete in November 2015.

The purpose of this study is to uncover the process and practices utilised to facilitate the development of children's thinking skills by a key educator within an early childhood centre rated as 'exceeding' under the National Quality Standard (ACECQA, 2014). The information collected will help others in the sector gain a fuller appreciate of how children's thinking is understood and facilitated by a key educator in a highly-rated service. Such understanding is vital in ensuring all children have access to high quality educational environments.

The research is being conducted in order to meet the requirements of the Masters of Research at Macquarie University. Data collection and analysis will be carried out by myself, Judith Skerritt, under the supervision of Dr Sheila Degotardi. Our contact details can be found at the bottom of this letter.

Data for this study will be collected using video-recorded observations and interviews over a period of 4 visits (1 per week). If you agree to participate you will be videotaped interacting with the children, followed by a short audio-taped interview (sometimes featuring video excerpts of your interactions with the children), in order to uncover how you support the development of children's thinking skills. Each videotaped session (4 in total) will last no longer than 2 hours and each audio-taped interview no longer than 30 minutes. Only 1 session and interview per week will occur. Not all interactions will be videotaped, only those involving educational interactions. Videotaped interactions may involve one child or multiple children either in small or large groups. Educational documentation related to the interactions will be requested to assist in understanding your interactions.

I am inviting all educators in your room to participate in this study. However only 1 educator per service will be investigated. Educator selection is a decision to be made by you, the educators in the room. Once this decision has been made, the selected educator should sign this form in the appropriate section to indicate their consent to being the participant or key educator for this study. All other educators should indicate their consent to being indirectly involved in the study by also signing the form in the appropriate section.

It is not anticipated that there will be any risks or discomfort involved in your participation. You should be aware that you are free to decide not to participate or to withdraw at any time without affecting your relationship with the researcher or Macquarie University.

Do not hesitate to ask questions about the study before or during the process of collecting data. After completion of the study I will by happy to share the findings with you and the service. The information you provide will be confidential. While the results of this study may be presented at professional meetings or published in a professional

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journal, your name and other identifying information such as photos, video footage or the service name will not be revealed.

Yours sincerely

Judith Skerritt
Macquarie University Student
Masters of Research
P: 0419632448
E: judith.skerritt@students.mq.edu.au

Associate Professor Sheila Degotardi
Macquarie University
Children and Families Research Centre
02 9850 9895
sheila.degotardi@mq.edu.au

NB:
Macquarie University Human Research Ethics Committee has approved the ethical aspects of this study. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the committee through the Director Research Ethics (02 9850 7854 or ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome

Agreement to Participate in Research as the Key Educator

I have read, or have had read to me, details about the purpose and procedures involved in this study. In addition, I have had the opportunity to ask questions which have been answered to my satisfaction. I agree to voluntarily participate as the key educator in the study as described.

Date	Participant Name	Participant Signature
Date	Director Name	Director Signature
Date	Researcher Name	Researcher Signature

Agreement for Indirect Participation in Research

I have read, or have had read to me, details about the purpose and procedures involved in this study. In addition, I have had the opportunity to ask questions which have been answered to my satisfaction. I agree to participate indirectly in the study as described.

Date	Educator Name	Educator Signature
Date	Educator Name	Educator Signature
Date	Director Name	Director Signature
Date	Researcher Name	Researcher Signature

Appendix E

Parent or Guardian Informed Consent Form

INSTITUTE OF EARLY CHILDHOOD
Faculty of Human Sciences

MACQUARIE University
SYDNEY·AUSTRALIA

Title: A Case study: How is higher-order thinking in young children understood, supported and sustained by educators within three preschool settings?

My name is Judith Skerritt and I am a student at Macquarie University completing a Masters of Research under the supervision of Dr Sheila Degotardi. I am completing a study to uncover the processes and practices used by key educators to support and promote the development of children's higher-order thinking skills within a preschool service rated as 'exceeding' under the National Quality Standard (ACECQA, 2014). The information collected will help others in the sector gain a fuller appreciation of how such thinking is understood and facilitated by a key educator in a highly-rated service. Such understanding is vital in ensuring all children have access to high quality educational environments.

This letter is to inform you I will be collecting data in your child's room over a period of 4 visits (1 per week) from late September. Data collection will involve videotaping of a key educator interacting with children as well as reading the educational documentation related to these interactions (e.g. child learning portfolio) so that I can more fully understand their educational practice. While the children in the room are not the focus of the investigation, they will be indirectly involved in data collection as they will be part of the interactions and learning experiences that are recorded and reviewed. As a result I seek your consent for the indirect participation of your child.

It is also important that the wishes of your child are respected. This means that in addition to requesting your permission I will require the verbal permission of your child. Without this verbal agreement your child will not be included in any filming related to the investigation. Nor will any documentation featuring your child be utilised.

Each videotaped session (4 in total) will last no longer than 2 hours. Only 1 session per week will take place. Following each session a short interview with the educator will occur to aid understanding of the practices observed. Not all interactions will be videotaped, only those involving educational interactions. Videotaped interactions may involve your child or multiple children either in small or large groups.

I don't anticipate that there will be any risks or discomfort as a result of this study. I am an experienced early childhood teacher with many years of practice in early childhood education. Video-recording will be carried out by me. If there are any signs that your child no longer wishes to be indirectly recorded, I will cease and delete any footage involving your child. Despite the absence of known risks and careful consideration given to respectful data collection, your child may not directly benefit from their indirect participation in this study.

If you consent to your child participating indirectly in this study you need to sign and return this form to your child's room leader.

Do not hesitate to ask questions about the study before or during the process of collecting data. After completion of the study I will be sharing the findings with the key educator and the service. The information provided will be confidential. While the results

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of this study may be presented at professional meetings or published in a professional journal, the names of participants (either directly or indirectly involved) and other identifying information such as the service name will not be revealed.

Yours sincerely

Judith Skerritt
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P: 0419632448
E: judith.skerritt@students.mq.edu.au

Dr Sheila Degotardi
Macquarie University
Children and Families Research Centre
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sheila.degotardi@mq.edu.au

Please return the following section if you agree to your child being indirectly included in the study.

Parent/Guardian Signature
I give permission for my child to participate in this study.

_____	_____	_____
Date	Parent/Guardian Name	Parent/Guardian Signature
_____	_____	_____
Date	Researcher Name	Researcher Signature

NB:
Macquarie University Human Research Ethics Committee has approved the ethical aspects of this study. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the committee through the Director Research Ethics (02 9850 7854 or ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Appendix F

Director Informed Consent Form

INSTITUTE OF EARLY CHILDHOOD
Faculty of Human Sciences

MACQUARIE University
SYDNEY·AUSTRALIA

Title: How is children's thinking understood, supported and sustained by educators within preschool settings?

My name is Judith Skerritt and I am a student at Macquarie University completing a Masters of Research under the supervision of Dr Sheila Degotardi. As part of my study for this qualification I am completing an investigation to uncover the processes and practices used by key educators to support and promote the development of children's higher-order thinking skills within a preschool service rated as 'exceeding' under the National Quality Standard (ACECQA, 2014). The information collected will help others in the sector gain a fuller appreciation of how such thinking is understood and facilitated by a key educator in a highly-rated service. Such understanding is vital in ensuring all children have access to high quality educational environments.

Your service is invited to participate in this investigation. The following information is intended to assist you decide whether you wish to be involved. My contact details, as well as those of my supervisor, are listed at the end of this letter.

Data for this study will be collected using video-recorded observations and interviews with 1 key educator in your service over a period of 4 visits (1 per week). If you agree for your service to participate one of your educators will be videotaped interacting with the children. Following this session the educator will participate in a short audio-taped interview (sometimes featuring video excerpts of their interactions with the children), in order to uncover how they support the development of children's thinking skills. Each videotaped session (4 in total) will last no longer than 2 hours and each audio-taped interview no longer than 30 minutes. Not all interactions will be videotaped, only those involving educational interactions. Videotaped interactions may involve one child or multiple children either in small or large groups. Educational documentation related to the interactions will be requested to assist in understanding your interactions.

Should you agree to the involvement of your service, all educators in the preschool room will receive an invitation to participate in this study. The invited educators will determine the key educator to participate in the study. Once decided upon, the selected educator will be required to indicate their consent to being the participant or key educator. All other educators will also required to provide their consent to being indirectly involved in the study by also signing the form in the appropriate section.

In addition to educator permission, the parents and children will also need to provide their consent to being involved as indirect participants. Even though the children are not the focus of the study, they will feature in educational interactions being videotaped and analysed. Consequently written permission will be gained from the parents, and verbal agreement from the children, prior to study commencement.

I don't anticipate there will be any risks or discomfort as a result of this study. I am an experienced early childhood teacher with many years of practice in early childhood education. Video and audio-recording will be carried out by me. If there are any signs that the children or educators involved in the study no longer wish to be involved in the study, I will ensure they are no longer video/audiotaped or utilised in any documentation analysis. Any pre-existing footage will also be deleted. Despite the absence of known risks

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and careful consideration given to respectful data collection, your service may not directly benefit from their participation in this study.

Do not hesitate to ask questions about the study before or during the process of collecting data. After completion of the study I will by happy to share the findings with you and the service. The information you provide will be confidential. While the results of this study may be presented at professional meetings or published in a professional journal, your name and other identifying information such as photos, video footage or the service name will not be revealed.

Yours sincerely

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NB:
Macquarie University Human Research Ethics Committee has approved the ethical aspects of this study. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the committee through the Director Research Ethics (02 9850 7854 or ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome

Director Agreement for the Service to Participate in the Research
I have read, or have had read to me, details about the purpose and procedures involved in this study. In addition, I have had the opportunity to ask questions which have been answered to my satisfaction. As Director, I agree to this service participating voluntarily in the study as described.

Date	Director Name	Director Signature
Date	Researcher Name	Researcher Signature

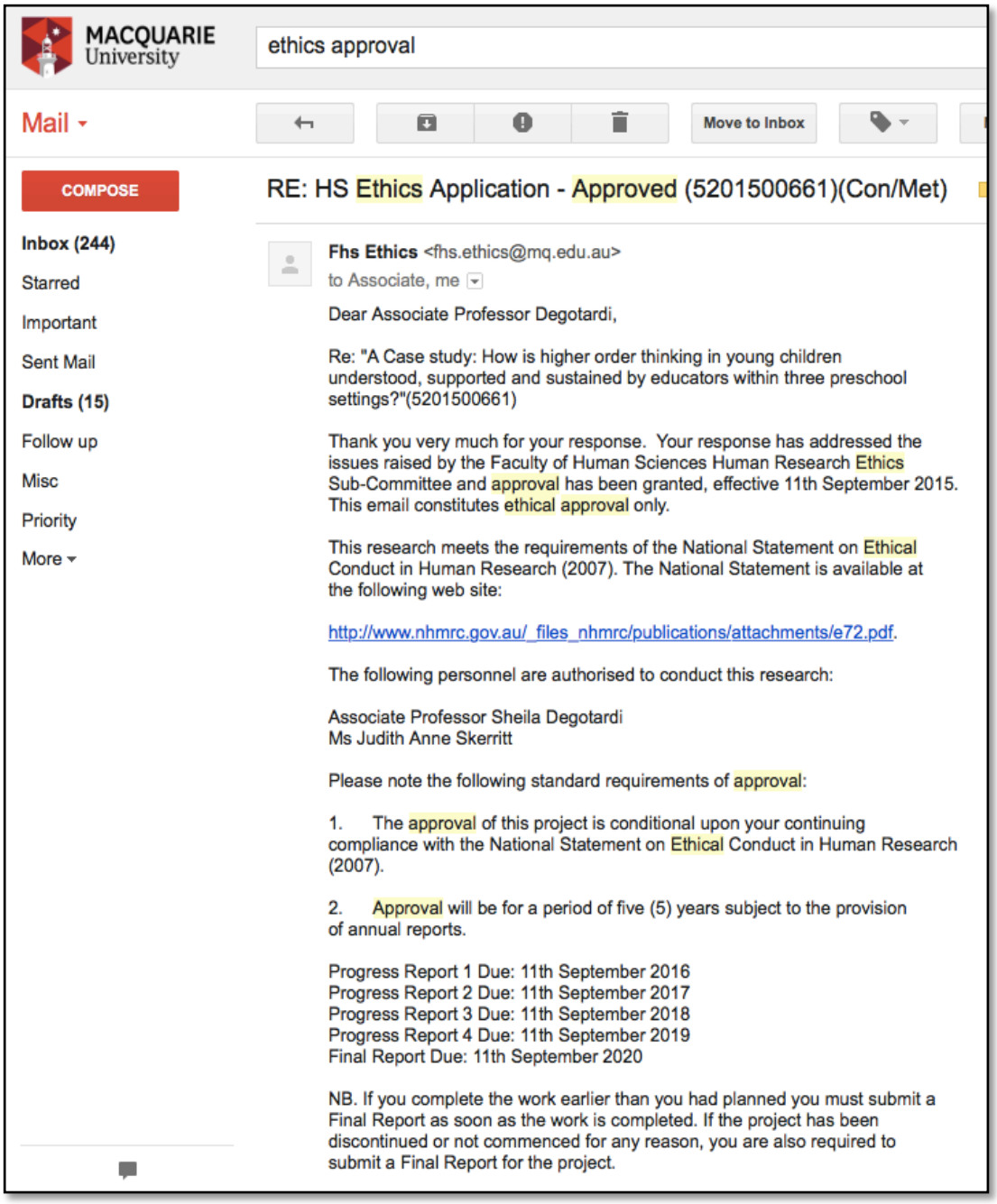
Service Name

Service Address

Service Contact Detail

Appendix G

Ethics Approval Notification



MACQUARIE University

ethics approval

Mail

Move to Inbox

COMPOSE

Inbox (244)
Starred
Important
Sent Mail
Drafts (15)
Follow up
Misc
Priority
More

RE: HS Ethics Application - Approved (5201500661)(Con/Met)

Fhs Ethics <fhs.ethics@mq.edu.au>
to Associate, me

Dear Associate Professor Degotardi,

Re: "A Case study: How is higher order thinking in young children understood, supported and sustained by educators within three preschool settings?"(5201500661)

Thank you very much for your response. Your response has addressed the issues raised by the Faculty of Human Sciences Human Research Ethics Sub-Committee and approval has been granted, effective 11th September 2015. This email constitutes ethical approval only.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Associate Professor Sheila Degotardi
Ms Judith Anne Skerritt

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).

2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 11th September 2016
Progress Report 2 Due: 11th September 2017
Progress Report 3 Due: 11th September 2018
Progress Report 4 Due: 11th September 2019
Final Report Due: 11th September 2020

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.