LEADING THE DEVELOPMENT OF THINKING
FOR UNDERSTANDING WITHIN INQUIRY

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Abstract

The notion of teaching thinking is one that has been discussed extensively in modern education yet it appears teachers, school leaders and policy makers have a limited understanding of what exactly this thinking consists of. The aim of this research was to define a thinking curriculum, check participant understanding of this definition and identify the educational leadership required to develop the alignment of this theory with classroom practice.

This research was conducted as a qualitative study utilising questionnaires and group interviews to gain insight into the current beliefs and practices of those involved in the research. This research took place in five primary schools that have a working relationship as a professional development cluster. This cluster of schools had a common goal to develop a thinking curriculum and in turn support teachers to put it into practice.

The findings of this research revealed that whilst there was an overwhelming belief by teachers and leaders that thinking should be taught in schools, descriptions of these types of thinking were broad and varied with very little cohesiveness within or across the cluster schools. Although a great deal of professional development had been undertaken in the area of teaching thinking a large number of participants remained unsure how all the pieces fit together or what the overall goals were. Participants in all schools felt however that school leaders had developed a culture of collaboration in a safe and supportive environment, which will be essential in overcoming these findings.

These findings suggest that the successful implementation of a thinking curriculum must consider how clarity of understanding can be achieved and how successful practice can be shared amongst teachers. School leaders must also consider how to develop greater input to and ownership of the goals present in the cluster.
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Chapter 1
INTRODUCTION

Context

In 2003 eight schools situated on Auckland’s North Shore commenced a professional development contract with the Ministry of Education. The main focus of this contract was teacher development in the use of Information and Communication Technology (ICT) both personally and in the classroom. With regard to the latter, inquiry learning was adopted as the pedagogy most suitable to incorporate ICT into learning and teaching. What became evident very early on was the fact that it was the pedagogy of inquiry driving the ICT development not the other way around as intended.

Teachers and principals discovered that inquiry required children to research authentic contexts often dealing with current real world issues. Developing real understanding of these issues required information that in many cases was no longer provided by traditional resources. Many books were no longer relevant or sufficiently up to date. Even CD-ROM’s, videos and DVD’s were becoming outdated. People’s time was becoming more and more precious and getting experts to come in to school to provide information was becoming increasingly difficult. The use of ICT allowed children to go beyond their local community to locate information relevant to their research. In addition to finding information the use of ICT also provided a powerful medium to present new insights, innovations and understandings.
As each school developed their curriculum around the pedagogy of inquiry, content became a burning issue. Teachers and principals alike felt that in order for real learning for understanding to take place, simply exposing children to as much information as possible during their time at school was no longer a suitable pedagogy as supported by (Steffe & Gale, 1995). The days of direct instruction were at an end. The outcome of this realisation resulted in some of the schools involved in the ICT contract developing a broad stroke approach to the curriculum with depth and understanding becoming the focus as opposed to isolated lessons or units covering all the stated outcomes in the curriculum.

In those schools where inquiry was adopted and becoming entrenched, concerns began to emerge about the depth of understanding children were actually developing within their individual or group inquiries. It became evident that children were confident in developing and planning their own investigations, however once embarking on their research they resorted to traditional fact finding missions. Once gathered, these facts were not being used to develop new understandings, provide necessary information to make difficult decisions or to solve complex problems. On the surface children were engaged in individualised, self-directed studies. In reality, they were doing what they had always done. The main difference now was that they were able to choose their area of research within a broader curriculum focus.

As a principal of one of the original eight ICT cluster schools, I had worked extensively with my teachers and management team to address this issue. Over time we came to the conclusion that teaching children to think about the information they were gathering would help deepen their understanding of the various concepts. This proved to be a highly complex and difficult undertaking.

In 2006 four of the original eight schools, of which I was one, and one new school came together in an effort to address this common concern by
submitting an application to the New Zealand Ministry of Education Extending High Standards Across Schools (EHSAS) development fund. If successful this would allow these five schools the opportunity to work collaboratively on developing a thinking curriculum. It was felt at the time that a focus on critical thinking would support children in developing a greater depth of understanding within their inquiries. Although unsuccessful in 2006, the group were awarded a four year EHSAS contract in 2007 to commence in 2008.

The five successful schools involved in the EHSAS contract are situated in suburban Auckland and provide instruction for children from years one to eight of their schooling, typically five to thirteen years of age. Two of the schools are contributing primary schools (years 1-6), two are full primary schools (years 1-8), and one is an intermediate school (years 7/8). This cross section of schools provided the opportunity to compare findings from different settings and allowed different perspectives to be considered when individualising programmes to meet the specific needs of each school. Within each of the schools there is also a considerable range of ethnicities with Maori, Pacifika and New Zealand European being most notable.

**Rationale**

Once awarded the EHSAS contract, the cluster schools set about creating an action plan. During this phase, the group raised some initial concerns, including: (a) a lack of teacher understanding of critical thinking; (b) how critical thinking could deepen student understanding; and (c) what leadership was necessary to address teacher professional development needs in this context. When questioned, teachers had great difficulty articulating a clear definition or understanding of the concept of critical thinking and consequently how it might facilitate deeper understanding amongst students.
This posed two significant problems. Firstly, if teachers do not have a sound understanding of what it is that they are trying to teach how can they possibly teach it, let alone expect children to learn it. The concern at the centre of this first problem is clearly articulated by Shulman (1987, cited in Hattie, 2009) who notes that “pedagogical content knowledge...is the basis of effective teaching” (p. 113). Secondly, if it is agreed that a child’s depth of understanding can be improved through a concerted effort in teaching thinking, as asserted by (Fisher, 2005; Lipman, 2003; Swartz, Costa, Beyer, Reagan & Kallick, 2008), a much clearer link must be established between the two. In considering the history of the context of this study it was also prudent to consider if in fact ‘inquiry’ (as first defined by Dewey, 1933) was an appropriate pedagogy for developing thinking and understanding.

**Research Aim and Questions**

In an effort to resolve the problems outlined above, the aim of this study was to identify the educational leadership necessary to establish a successful professional development programme for teachers to develop thinking for understanding within inquiry. To achieve this aim the initial stage of this research required a review of existing literature to define and identify the relationship between the terms thinking and understanding. This was followed by an examination of pedagogical theories that support this relationship. A review of educational leadership literature was also conducted to identify best practice as it related specifically to teacher professional development. The findings of these literature reviews combined to provide ‘ideals’ that were compared to teacher and school leader understandings and practice. Data provided by these comparisons was used to identify theory to practice gaps. This gap analysis subsequently informed the development of recommendations for use by the cluster schools to establish an informed, focussed, research based professional development plan designed to guide professional learning in teaching thinking for understanding within inquiry.
In considering this aim it was apparent that there were a number of themes that required consideration independently before being pulled together to form any well-constructed conclusions. To address this, the following questions were developed to guide the research:

1. Why is a focus on thinking for understanding necessary in schools?
2. How are the terms thinking, understanding and inquiry defined within a school context and how are they connected?
3. How does current teacher practice align with theory?
4. What conditions must exist in schools to make thinking for understanding a fundamental part of learning?
5. How does current leadership of teacher professional development align with theory?
6. What leadership is necessary for a professional development programme for teachers in thinking for understanding within inquiry?

**Thesis Organisation**

The following chapters are organised to first provide the reader with a theoretical understanding of the research problem and the chosen methodologies before moving to an analysis of findings from the data followed by a discussion of the implications resulting in future recommendations.

Chapter Two provides a review of the literature regarding teaching thinking particularly as it relates to inquiry learning approaches. The findings of this review are presented as a thinking curriculum framework. A review of educational leadership literature is also conducted with a view to identify links between curriculum leadership and improved teacher practice ultimately leading to improved outcomes for children.
Chapter Three provides an outline of the research methodology and design. It includes a rationale regarding the choice of methodology used in relation to the context of this research problem. Further to this it outlines how participants were selected and what methods were used to gather data. An effort is also made to highlight the limitations of this study and what measures have been taken to address these where possible.

Chapter Four presents and analyses the data collected through questionnaires and focus group interviews. Key findings are identified for discussion.

Chapter Five discusses the findings as they relate to my research questions. Emerging themes are compared with the findings of the literature review in Chapter Two to assist in identifying theory to practice gaps in the area of leading professional development.

Chapter Six presents a theory to practice gap analysis in which areas of alignment and misalignment are outlined in relation to the research questions. Conclusions drawn from this analysis are used to provide the basis for a set of recommendations and a working model of teacher development. The limitations of this study are presented along with suggestions for areas of further research.

Appendices and a full bibliography are included as references at the end of this document.
Chapter 2
LITERATURE REVIEW

Introduction

This literature review begins by exploring how thinking came to be such a significant factor in present day education. To better understand the notion of thinking for understanding within inquiry a synthesis of different ideas provides working definitions for key terms used throughout this research. As a necessary precursor to real change in learning and teaching, a look into the idea that schools need to establish a thinking culture is explored as it relates to the enculturation of thinking. Assuming this culture of thinking is possible, a variety of teaching models are scrutinised for their ability to improve opportunities, abilities and dispositions in thinking and more importantly how they might ultimately contribute to improving student understanding. Having discussed various models an effort is made to show how they can actually compliment one another as opposed to treating them as separate entities requiring the selection of a one size fits all approach. The outcome of this synthesis is presented as a model or framework providing a thinking curriculum of sorts. Finally, in considering the complexities and challenges inherent in the pedagogical and cultural shifts required to infuse thinking into current practice, educational leadership theories are examined to identify how this curriculum development could be facilitated successfully.
Thinking in post-modern education

With thinking for understanding being at the core of the context of this study is important to understand how it has become such a significant component of modern education. Modern schooling, as we know it today, took shape in developing nations during the nineteenth century. The influence of industrialisation and urbanisation had a significant impact on the role of education. As societies grew, the need for a system to prepare children for a future in the workforce to ensure economic development became a priority. What was to be taught and to whom were the topics of great debate. Governments took hold of the situation and state-supervised schooling has been with us ever since (Rury, 2005). Wiske (1995) notes “The ‘common school’ movement, with its principal origins in the 1840’s, began with hopes for a powerful education for all children” (p. 15).

The debate over what was taught resulted in a curriculum that focussed largely on the ‘three R’s’. Reading, writing and arithmetic were seen as essential skills for a productive future. Governments and academics agreed that schools should also assist children in understanding what being a member of a democratic society meant. Rury (2005) describes schools at this time as being:

…associated with preparation for life, and for work in particular. This is not to say that education became vocationalised, even if attention to job preparation in the schools increased a great deal, rather schooling increasingly was directed at the cultivation of proper ‘habits’ of industriousness and responsibility, along with essential skills of literacy, numerical calculation, and knowledge of history, geography and other subjects. This was education for citizenship, of course, but it also was preparation for industrial life. (p. 64)

In achieving this ideal, Rury suggests students will leave school and become contributing members of society. Bourdieu (1977, cited in Halsey, Lauder, Brown & Wells, 1997) raises the notion that realising the potential of the school population would provide developing nations with greater
‘social capital’. This capital would contribute to the economic growth of the nation. The underlying issue here is the tension between education for learning and education for social and economic growth.

This tension provides the backdrop for the next phase in state-supervised schooling, accountability. As cities grew, so did schools. Single classrooms were replaced with multi-room schools requiring systems and structures to cope with the demands inherent in any organisation. Industry provided a suitable metaphor for running these pseudo factories. Instead of producing cars, schools produced learned students. With the amount of money now being spent on schools and the demands of the workforce ever present, systems were put in place to ensure schools were doing their job. Standards or grades were established to give schools clear achievement expectations. Testing was developed to ensure children had learnt enough to graduate to the next stage. “Covering material encompassed within first-, second-, third-grade readers became a dominant theme in schools. Memorisation took up much of a child’s time” (Wiske, 1995, p. 17). Learning theory was developed around the behaviourist model where favourable or correct responses were rewarded regardless of the participants understanding of the behaviour or response (Glaserfield, in Steffe & Gale, 1995).

In an effort to better understand the general principles of learning within this behaviourist paradigm, psychologists conducted experiments with animals demonstrating how positive feedback, typically in the form of food, reinforced desired behaviours. This theory of learning when applied to the education of children suggested that, by rewarding correct answers and appropriate behaviour, children would become more engaged perpetuating more correct answers and better behaviour thus generating better grades. Boghossian (2006) provides a clear description of this behaviourist theory of learning:

In a behaviourist paradigm, the student is engaged in the educational process only in that she displays the appropriate verbal behavior (e.g. checking the correct box on a multiple choice test).
There is no subjective element to learning—either in determining what to study or in how information is interpreted, used, or understood. (p. 716)

This paradigm has endured a century of immense global change as demonstrated by the proliferation of high stakes testing, league tables, and government policies such as “no child left behind” (No Child Left Behind Act, 2001, section 14) which clearly consider a successful education as one’s ability to attain certain standards of achievement as measured by external exams, tests and assessments which is confirmed in the statement: “all children [will] have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at a minimum, proficiency on challenging state academic achievement standards and state academic assessments” (No Child Left Behind Act, 2001, section 14, p. 39). For many students, success in school has little to do with true understanding and a great deal to do with curriculum coverage (Brooks & Brooks, 1993).

Lipman (2003) provides an overview of the key principles inherent in this behaviourist paradigm:

1. Education consists in the transmission of knowledge from those who know to those who don’t know
2. Knowledge is about the world, and our knowledge of the world is unambiguous, unequivocal, and unmysterious
3. Knowledge is distributed among disciplines that are non-overlapping and together are exhaustive of the world to be known
4. The teacher plays an authoritative role in educational process, for only if teachers know can students learn what they know
5. Students acquire knowledge by absorbing information, i.e., data about species; an educated mind is a well stocked mind (p. 18)

Since the conception of modern education there has existed an undercurrent of dissatisfaction amongst numerous academics, politicians, philosophers and teachers. Many felt that there was a great deal more to education than was provided by the prevailing behaviourist paradigm. The alternative paradigm has many definitions and encompasses numerous
theories including: scientific inquiry (Dewey, 1933); constructivism (Piaget, 1967); thinking for understanding (Wiske, 1995); and communities of inquiry (Lipman, 2003). The one constant in all these theories is that knowledge is constructed and thinking is required to make sense of this new knowledge to ensure real understanding.

A belief held by many (Bloom, 1956; Ennis, 1963; Fisher, 2005; Lipman, 2003; Paul, 2006) is that critical thinking, when clearly defined, establishes guidelines, that if adopted by schools and universities, has the potential to provide students with a deeper understanding of the concepts they encounter rather than a basic knowledge of rules, facts and formulas that they have memorised. Lipman (1988) asserts that:

If teaching critical thinking can improve education, it will be because it increases the quality of meaning that students derive from what they read and perceive and that they express in what they write and say. (p. 43)

If a curriculum rich in opportunities to think skilfully is delivered to students, the necessary means to solve problems and make decisions based on deep understandings can be taught (Swartz, Costa, Beyer, Reagan & Kallick, 2008).

Significant evidence of this renewed interest in critical thinking in education abounds. A trip to the local teaching resource centre highlights the growth in the number of ‘how to’ manuals for teachers in the area of thinking. Whole isles are dedicated to the teaching of thinking. Professional development providers issue numerous flyers promoting workshops for teaching thinking and developing thinking curricula. Whole conferences are dedicated to the notion of thinking. “Almost every new curriculum report and guideline now emphasises the importance of promoting thinking and reasoning, as well as knowledge about the world, as essential foundations for successful learning” (Fisher, 2005, p. 209). Our own revised New Zealand Curriculum (2007) now has thinking included as a ‘key competency’.
Even with all this focus on thinking there still appears to be a lack of consistent understanding of just what is meant when we talk about thinking as it relates to learning and teaching. Numerous authors (Fisher, 2005; Gardner, 1999; Lipman, 2003; Ritchhart, 2002; Swartz et al, 2008; Tishman, 1995) highlight the concern that although schools and universities are now expected to address thinking within their programmes as a means to deepen student understanding, very few educators or leaders within these institutes can clearly articulate what thinking is, let alone associated skills, dispositions, dimensions or principles. Bailin, Case, Coombs and Daniels (1999) highlight the importance of sound definitions when undertaking the teaching of thinking:

Critical thinking is a subject of considerable current interest, both in terms of theory and pedagogy. A great deal is written about critical thinking, conferences on the subject abound, and educational initiatives aimed at fostering critical thinking proliferate. It is our view that much of the theoretical work and many of the pedagogical endeavours in this area are misdirected because they are based on faulty conceptions of critical thinking. (p. 269)

Defining thinking for understanding and inquiry

To establish a successful professional development programme for teachers in the context of teaching thinking for understanding within inquiry, the relevant terms must be clearly defined and understood. In defining thinking, for the purposes of this research we must examine what conditions necessitate its use in the school context. In broad terms thinking is required when a student: uses reasoning to develop understanding; makes judgement in the decision making process; applies understanding of issues and possible solutions to solve problems; or creates something original and valuable (Sternberg, 1998). A student involved in all or any of these activities requires a deep understanding of the underlying concepts to fulfil their task, that is, decision making without a deep understanding of the available options is simply guesswork.
Reasoning can be considered the act of drawing conclusions from evidence. Establishing truth lies at the heart of reasoning. Ennis (1962) discusses the notion that although there may only be one right way to think correctly, there are many ways to make mistakes in our thinking. Reasoning relies on logic to ensure the correctness of facts or statements. By ensuring that new knowledge is accurate we can be confident that new understandings will be more reliable. This is supported by Ennis’ (1962) original definition of critical thinking being “the correct assessing of statements” (p. 83), which he has since revised to “reasonable reflective thinking that is focused on deciding what we believe and do” (1987, p. 45). This change in definition suggests a shift in emphasis to the application of correct knowledge as opposed to simply being right. The risk associated with this sort of thinking is the lack of focus on the big picture (Fisher, 2005). By focusing so closely on the details one could easily lose sight of whether or not the information being scrutinised was in fact useful in addressing the wider context.

The ability to make sound decisions based on good judgements goes some way to addressing this concern. It also highlights the fact that thinking cannot be considered as separate parts, rather it should be considered as having complimentary, interwoven components acting together to ensure good thinking. Good decision making relies on good judgement (Swartz et al, 2008). In the course of our lives we make countless decisions, big and small, all requiring us to judge the worth, importance, significance, consequences or personal value of the available options. The skill with which we carry this out often determines the success of the choices we make.

In cases where possible choices are not evident we must adopt problem solving strategies. Sternberg (1998) provides an analogy to highlight the difference between decision making and problem solving:

The goal of problem solving is to move from a problem situation (e.g., not having enough money to buy a new car) to a solution,
overcoming obstacles along the way. The goal of judgement and decision making is to select from among choices or to evaluate opportunities (e.g., choosing the used car that would please you most for the amount of money you have). (p. 321)

Problems can generally be divided into two types of problem. The first being well-structured problems with a well defined path to find a solution such as a mathematical problem. The other being an ill-structured problem where there is no clear, pre determined path to follow to find a solution. In both cases our aim is to find a suitable solution.

In solving these problems consideration must be given not only to the acquisition of correct information and judgement of the possible solutions or decisions, but also to the options that are less conventional. As an architect designing a new home, if attention is not given to the lifestyle choices and tastes of the client, the design could be fully functional but completely inappropriate (Lipman, 2003). This highlights the importance of creativity within all thinking. Without creativity, originality and artistic merit would not exist. Of all the components of thinking creativity is perhaps the most difficult to define, yet when we see it we know it exists. Sternberg (1998) highlights his own challenges in trying to define creativity:

How can we possibly define creativity as a single construct that unifies the work of van Gogh and of Einstein? Although there may be as many narrow definitions as there are people who think about creativity, most would broadly define creativity as the process of producing something original and valuable. The something could be a theory, a dance, a chemical, a process or procedure, or almost anything else. (p. 343)

In the creative world we find open-mindedness, spontaneity, curiosity, originality and freedom from rules (Ritchhart, 2002).

Having defined thinking as both critical and creative dispositions as a means to solve problems, make decisions or better understand a unfamiliar concepts, we look to a pedagogy that provides opportunities for all to exist purposefully in authentic learning situations. Inquiry, as it is
most commonly referred to as, can be defined as the process or structure that is followed to assist in solving problems. Dewey (1933) applied scientific inquiry to this notion of problem solving in his work *How We Think*. This was the beginning of inquiry being bought into the common school arena. Scientific inquiry provided a model to guide the problem solving process. Lipman (2003) presents an interpretation of Dewey's model as:

...sensing a difficulty, [people] would note that something they had been taking for granted, some belief they had assumed to be true, could no longer be counted on as reliable. It would be necessary to define the problem, convert wishes into possible hypotheses as possible ways of achieving ends-in-view, imaginatively consider possible consequences of acting on these hypotheses, and then experiment with them until the problem was resolved. (p. 35)

It is clear from Dewey's definition that thinking in all its forms is required at every stage of the inquiry process. Critical reasoning is required to test assumptions, creative thinking provides possible solutions and critical judgement guides the decision making process. The problem itself provides the context for thinking in which the aim is to establish a better understanding of the issue and react accordingly.

Defining understanding as it pertains to schools and education is more subjective. Knowledge is often discussed in the same breath as understanding, yet there is a subtle but important difference. Knowledge is merely the information we have at our disposal (Ritchhart, 2002). Using skills, abilities, strategies or techniques to put our knowledge to work in demonstrating our awareness of how the information can be used, organised and applied to a variety of situations or contexts highlights our understanding. Perkins (1998, cited in Wiske, 1998) defines understanding generally as “the ability to think and act flexibly with what one knows” (p. 40). This definition implies that one’s understanding stems from reflection on current knowing and can be demonstrated through some kind of performance. DeBoo (1999) offers a slightly more technical definition suggesting that “understanding is knowing how to apply knowledge in
different situations, and knowing how to select appropriate knowledge to use and apply” (p. 86). The idea that knowledge must be selected has its own difficulties. (De Boo, 1999; Fisher, 2005; Lipman, 2003; Ritchhart, 2002) all agree that knowledge is constantly changing. What we know or our body of knowledge changes “as time and technology modify our experiences and perceptions” (De Boo, 1999, p. 82).

Accepting that knowledge is not a constant, schools can no longer continue to be institutes that aspire to fill the minds of children with predetermined facts about unrelated content. “Accepting the proposition that we learn by constructing new understandings of relationships and phenomena in our world makes accepting the present structure of schooling difficult” (Brooks & Brooks, 1993, p. 5). With a renewed focus on developing understanding, children must be aware of the limitations and flexibility of new knowledge and schools must allow children the opportunity to think critically about information as they investigate new areas of learning. This requires an environment that not only allows thinking, but more importantly, actively promotes thinking.

**Learning in a culture of thinking**

If ‘thinking skills’ are to be considered the focus of professional development efforts, conditions necessary to nurture and sustain them must be examined. Tishman, Perkins and Eileen (1995) propose that “in order for skills to become part of day-to-day behaviour, they must be cultivated in an environment that values and sustains them” (p. 1). Lipman (2003) suggests one way to provide a suitable environment is to convert classrooms to ‘communities of inquiry’ in which:

…students listen to one another with respect, build on one another’s ideas, challenge one another to supply reasons for otherwise unsupported opinions, assist each other in drawing inferences from what has been said, and seek to identify one another’s assumptions. A community of inquiry attempts to follow
the inquiry where it leads rather than be penned in by the boundary
lines of existing disciplines. A dialogue that tries to confirm logic, it
moves forward indirectly like a boat tacking into the wind, but in the
process its progress comes to resemble thinking itself.
Consequently, when this process is internalised or introjected by
the participants, they come to think in moves that resemble its
*procedures*. (p. 20)

Unlike more structured approaches to the direct instruction of thinking, a
community of inquiry is a culture in which thinking is the norm. This norm
can be developed over time as children become confident in the process
of philosophical debate. Ritchhart (2002) discusses eight cultural forces
that impact directly on a classrooms culture, thinking or otherwise:

- The expectations for students’ thinking and learning that the
teacher conveys
- The routines and structures that guide the life of the classroom
- The language that the teacher and students use and the
conversations they engage in
- The opportunities, work, or activities the teacher creates for
students
- How the teacher acts and what the teacher models for students
- The attitudes that the teacher and students convey
- The interactions and relationships between the teacher and the
students as well as among the students themselves
- The physical environment and artefacts present in the room (p.
146)

These forces provide a starting point for teachers to examine the existing
culture within their classrooms. If understanding is the ultimate goal of
learning then this can provide the context by which we examine our
current classroom culture against these forces. Do activities require
thoughtful responses? Does the teacher model thinking? Does the teacher
discuss what kind of thinking they are using? Is children’s thinking evident
in the room? Who asks most of the questions?
Tishman et al. (1995) describe a classroom where a culture of thinking is established. “There is a sense that ‘everyone is doing it’, that everyone - including the teacher - is making the effort to be thoughtful, inquiring, imaginative, and that these behaviours are strongly supported by the learning environment” (p. 2). By establishing this norm classrooms begin to enculturate members into a community of inquiry where thinking for understanding is a way of life as opposed to something we do on Thursday afternoon.

Teaching for understanding within a culture of thinking

If the intended outcome of the professional development programme at the centre of this study is that thinking for understanding is established as a cultural norm, it is apparent that traditional transmission methods of teaching are no longer appropriate. Piaget (2002) discusses the notion that learning cannot be done to someone. Understanding is shaped as we make connections and establish relationships between new information and our existing knowledge as it becomes apparent. Brooks and Brooks (1993) suggest “each of us makes sense of our world by synthesising new experiences into what we have previously come to understand” (p. 4).

Although not complete, school leaders and teachers at least have a basic understanding of how we might develop understanding in children. To varying degrees these ideas are employed with some success. However what is still very much an area of discussion is how ‘will to think’ is developed. The old saying “You can lead a horse to water, but you can’t make it drink” comes to mind. You can lead a child to school, but you can’t make it think. The term ‘disposition’ is one that is frequently used when grappling with this issue. In simple terms disposition relates to the ‘will’. As one might discuss the will to survive in the context of being stuck in the bush one might discuss the will to think when confronted with a problem. Without a thinking disposition we might ask how a child can develop new understandings independently outside the classroom. Ritchhart (2002)
suggests that clarity of process and outcomes can facilitate reflectivity. It is this reflective behaviour that motivates one to act (or not to act as the case may be). Reflecting on new understandings in order to perform them (Perkins, 1998, cited in Wiske, 1998) requires a pedagogy that supports children’s involvement in developing curriculum goals.

Dewey (1933) suggested scientific inquiry offered real opportunity for developing deep understandings. By utilising scientific methods students had to consider all the facts to prepare a hypothesis and in turn connect new learning to old to develop new understandings of their world. This idea however did not address the notion of understanding in areas such as art and history. Brooks and Brooks (1993) highlight the role of constructivism in addressing this concern. They argue that schools “can become settings in which teachers invite students to search for understanding, appreciate uncertainty, and inquire responsibly” (p. 6).

In developing new understandings through inquiry, a wide breadth and depth of thinking is required. Although a great deal of literature exists around thinking as a necessary part of learning (Brooks & Brooks, 1993; Fisher; 2005; Gardner, 1999; Lipman, 2003; Ritchhart, 2002; Swartz et al, 2008; Tishman et al, 1995; Wiske, 1998), very few discuss what conditions must exist to necessitate thinking. Swartz et al (2008) go someway to address this in suggesting that skilful thinking should be explicitly taught within three “complex thinking tasks” (p.14); decision making, problem solving and conceptualising. Sternberg (1998) includes ‘thinking creatively’ in this list.

Thinking, as it may appear in the classroom, is often reduced to a set of skills. This approach is well provided for by an absolute plethora of literature on thinking routines, maps, styles, hats and organisers (Buzan, 2003; DeBono, 1992; Hyerle, 2004; Ryan, 1990; Venn, 1880). What appears to be lacking is literature that demonstrates how successful understanding of well-constructed learning outcomes (Biggs, 2003) is connected to pedagogy, thought provoking tasks and thinking skills or
routines. Also lacking is a model that clearly situates these terms to show which skills or routines relate to each of the thinking tasks and more importantly how. The correct thinking it seems is left to chance.

**An all-encompassing model of thinking**

If school leaders are to provide professional development for teachers to become skilled practitioners in teaching thinking for understanding a framework that provides a theoretically sound basis for instruction is essential. In having this framework we address two significant concerns. The first, defining what a thinking curriculum should consist of, and secondly, identifying what those delivering a thinking curriculum must understand.

Having previously defined the terms commonly used when discussing thinking for understanding in modern schooling, we must examine how these terms are situated in relation to one another. Figure 2.1 provides a synthesis of the key terms identified in the literature and an interpretation of the literature places these in a framework that outlines how they are each reliant on a broader context. That is, for example, successful inquiry relies on the learner to be both critical and creative in their thinking as supported by (Dewey, 1933; Ennis, 1987; Fisher, 2005; Lipman, 2003; Perkins, 1998; Swartz et al., 2008). Thinking skills must be taught to enable the learner to address a real purpose or problem as suggested (Ennis, 1987; Hyerle, 2004; Perkins, 1998; Ritchhart, 2002; Swartz et al. 2008). The quality of thinking is governed not only by ones skill but also ones will or disposition to think (Fisher, 2005; Perkins, 1998; Ritchhart, 2002; Sternberg, 1998). This disposition is best fostered in a supportive culture of thinking (Ritchhart, 2002).
Environment
Culture of Thinking
Evaluated against eight cultural forces (Ritchhart, 2002, p. 146)

1. Expectations
2. Routines
3. Language
4. Opportunities
5. Actions
6. Attitudes
7. Relationships
8. Environment

Dispositional Thinking
Critical/Creative Thinking
(Ennis, Perkins, Sternberg, Swartz)

Critical thinking first defined by Ennis as ‘the correct assessing of statements’ (1962, p. 83), revised to ‘reasonable reflective thinking that is focused on deciding what to believe and do’ (1985, p. 45) is undertaken within three dimensions of thinking whilst considering the twelve aspects of critical judgement.

Logical Dimension—Does the statement make sense assuming one understands the meanings of any relevant terms;

Critical Dimension—Is there sufficient knowledge of the criteria to judge the statement, except where the criteria is logical;

Pragmatic Dimension—Does the statement address its intended purpose

Twelve aspects of critical judgement

- Judging whether a statement is specific enough
- Judging whether a statement is actually the application of a certain principle
- Judging whether an observation statement is reliable
- Judging whether an inductive conclusion is warranted
- Judging whether the problem has been identified
- Judging whether something is an assumption
- Judging whether a definition is adequate
- Judging whether a statement made by an alleged authority is acceptable

Critical/Creative Thinking
Creative thinking defined as ‘the process of producing something that is both original and valuable.’ (Sternberg, 1998, p. 344)

Something—a theory, a dance, a chemical, a possible solution to a problem, a process or procedure, or almost anything else

Original—ideas, techniques, theories, styles developed in novel, unconventional and valuable ways based sometimes on analysis and synthesis of information from predecessors

Valuable—the something is significant, useful, or worthwhile in some way to some segment of the population or some field of endeavour

Pedagogy
Inquiry
Lipman (2003) presents an interpretation of Dewey’s (1933) model of ‘scientific inquiry’:

sens[ing] a difficulty, [people] would note that something they had been taking for granted, some belief they had assumed to be true, could no longer be counted on as reliable. It would be necessary to define the problem, convert wishes into possible hypotheses as possible ways of achieving ends-in-view, imaginatively consider possible consequences of acting on these hypotheses, and then experiment with them until the problem was resolved. (p. 35)

The inquiry process is operationalised within three thinking tasks. Thinking may be required in one, two or all three of these tasks depending on the issue requiring investigation (Swartz et al, 2008).

Problem Solving
Decision Making
Conceptualising

Goal: finding the best solution to an identified problem
Goal: Choosing the best course of action
Goal: deep understanding

Curriculum
Core/fundamental types of thinking
The successful undertaking of the thinking tasks within inquiry require to varying degrees and in various combinations these types of thinking to be undertaken skilfully as identified by (Ennis, 1987; Hyerle, 2004; Perkins, 1995; Ritchhart, 2002; Swartz et al., 2008).

<table>
<thead>
<tr>
<th>Define</th>
<th>Describe</th>
<th>Classify</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe</td>
<td>Sequence</td>
<td>Compare and contrast</td>
</tr>
<tr>
<td>Cause and Effect</td>
<td>Evaluate</td>
<td>Part whole relationships</td>
</tr>
<tr>
<td>Predict/Hypothesis</td>
<td>Generalise</td>
<td>Analogy/Metaphor</td>
</tr>
<tr>
<td>Make connections</td>
<td>Reason with evidence</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.1: Situating Thinking
The skills presented in the curriculum section of Figure 2.1 represents an amalgamation of terms discussed by numerous authors in this field. The use of the term curriculum is intentional as it implies the need for direct instruction of these components. Swartz et al (2008) makes a strong case for the direct instruction of thinking skills by suggesting that the initial purpose is not to use each skill in context, rather it is to understand and become proficient in a certain type of thinking. Once understood, the purpose then shifts to using each skill in different settings. Ultimately the aim is self-selection of appropriate types of thinking to best address the purpose at hand. That is, for example, to compare and contrast possible options and identify possible outcomes or effects to make a good decision.

It is important to note that this model merely places the parts of thinking in a seemingly logical arrangement based on one interpretation of the associated literature to aid in understanding the connections between these terms. It is not designed as a hierarchical programme for teaching thinking nor is it a definitive set of criteria for developing a thinking curriculum. It is not enough to provide schools, school leaders, or teachers with this model and expect them to understand and therefore teach thinking skilfully.

In order to implement this model successfully each part must be examined and defined fully and strategies for teaching skilful thinking in particular must be developed with teachers and implemented in classrooms. This work will provide the basis for ongoing reflection and further development as teachers become familiar with the inherent strengths and weaknesses of such a programme. This process of implementation and ongoing review must make use of current educational leadership theories to ensure best teacher practice is achieved.
Educational leadership for teacher development

With the development of learning and teaching clearly the main focus of the cluster schools EHSAS contract, educational leadership theories were researched in an effort to establish a model of successful practice with regard to the development of a professional development programme for teachers. Setting aside the managerial model, there are three significant educational leadership models discussed throughout the literature: instructional, transformative, and distributive leadership. As management is more concerned with “maintaining efficiently and effectively current organisational arrangements” (Cuban, 1988, cited in Bush, 2003, p. 8) it is not a model worth considering in achieving the aims of the cluster schools in which significant curriculum reform is the intended outcome.

Instructional leadership has at its core, learning and teaching. Educational leaders who employ this model ensure that all plans, decisions and actions aim to improve the quality of learning and teaching. The broader view of this model considers learning as an exercise in development for teachers and children alike. Southworth (2002, cited in Bush, 2003) states that “instructional leadership...is strongly concerned with teaching and learning, including the professional learning of teachers as well as student growth” (p. 15).

In an effort to further define instructional leadership Southworth (2004) and Blasé and Blasé (1999) identify a similar feature, that is instructional leaders engender a culture of professional dialogue regarding pedagogy. Although not explicit in the literature it is implied that this would occur primarily between the teacher and the principal, however it does not rule out the idea that these conversations could take place between other leaders within in the school and teachers, i.e. deputy principals or curriculum leaders. With instructional leadership having such well intentioned outcomes, it is interesting to note that Hallinger (1992, cited in Bush, 2003) suggests “instructional leadership has been supplanted by transformational leadership” (p.15).
Perhaps the rationale behind Hallinger's statement is the assumption that the development of learning and teaching is inherently part of transformational leadership. With learning and teaching being the core business in any school, it is not difficult see how Hallinger may have come to this conclusion. Transformative leadership has been defined as the leadership of people. Leaders working within this model aim to get everyone ‘on board’ to achieve common goals (Harris, 2005). Burns (1978, cited in Fidler & Atton, 2004) asserts that “transformational leadership seeks to inspire followers to exceed their own and the leaders expectations” (p. 24). Starratt (2003) lists the features of transformational leadership as “(a) setting directions, (b) developing people, and (c) redesigning the organization” (p. 8). Leithwood et al. (1999, cited in Harris, 2005) introduce the additional task of “building relationships within the school community’ (p. 80). With so many demands inherent in transformational leadership it is little wonder a new model is emerging (Bottery, 2004).

When studying the concept of leadership, traditional research has examined those individuals identified as leaders (Bottery, 2004). Studies have shadowed these people and observed their interactions in an effort to identify what successful leadership consists of. Recently this focus has changed. Rather than focus on individual leaders, an effort has been made to describe the act of leadership in all its forms:

From this perspective, leadership is then much more easily appreciated as a shared, group and distributed process than has been generally recognised, either in the literature, or in the way in which roles and positions are created in organisations. (Bottery, 2004, p. 20)

This new focus has lead to the emergence of distributive leadership. Through their review of current literature regarding this relatively new theory, 1996 and beyond, Woods, Bennett, Janet and Harvey (2004) identify the three main elements of distributive leadership as (a) emergent
property, (b) openness of boundaries, and (c) leadership according to expertise. The first element identified here suggests that leadership grows or emerges from within a group. This emergent leadership is carried out cooperatively giving it the benefit of pooled knowledge, skills and expertise. This idea is made possible by the second element of open boundaries. By doing away with closed leadership groups, opportunities are created for anyone within an organisation to lead where applicable. Distributive leadership allows those with particular expertise to develop within the organisation, a specific area of ability in concert with similarly skilled and interested peers to a common end (Harris, 2005). As Woods et al. (2004) suggest “leadership [should] attach itself to the best expertise for the issue at hand” (p. 454).

In the ‘Best Evidence Synthesis’ (BES) work of Timperley, Wilson, Barrar and Fung (2007) a summary of leadership roles or tasks that have been seen to have positive outcomes for students is presented. This summary identifies, Developing a vision; Managing and organising; Leading the professional learning; and Developing the leadership of others (p. 193) as essential elements of successful educational leadership. Table 2.1 provides an interpretation of how the four major categories identified by Timperley et al. (2007) require leadership from each of the three models outlined above.

<table>
<thead>
<tr>
<th></th>
<th>Instructional</th>
<th>Transformative</th>
<th>Distributive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>• Vision linked to student outcomes</td>
<td>• Setting direction</td>
<td>• Identifying a common end</td>
</tr>
<tr>
<td>Managing and Organising</td>
<td>• Plans, decisions and actions</td>
<td>• Redesigning the organisation</td>
<td>• Self and peer directed</td>
</tr>
<tr>
<td>Leading PL</td>
<td>• Learning and teaching focus</td>
<td>• Developing people</td>
<td>• Sharing expertise</td>
</tr>
<tr>
<td>Leadership development</td>
<td>• Teacher PL</td>
<td></td>
<td>• Identifying expertise</td>
</tr>
</tbody>
</table>

Table 2.1 – A synthesis of BES and educational leadership models

In recent studies Bottery (2004) identified that successful school leadership is more “appreciated as a shared, group and distributed process than has been generally recognised, either in the literature, or in the way in which roles and positions are created in organisations” (p. 20).
Timperley et al. (2007) add that “part of the leader’s job is to build capacity within a school by developing the intellectual and professional capital of its staff; this includes leadership potential” (p. 193). Consideration must be given to these findings to ensure appropriate leadership practices are woven into a teacher professional development programme.

As with teaching thinking, it is important for the leader, regardless of style, to develop a culture of learning. This is not to suggest that the leader must get approval or voluntary involvement from teachers, but rather it suggests that leaders must create an environment where professional learning is an expectation. Timperley et al. (2007) highlights cases of leaders participating in the learning themselves rather than organising the learning of others in an effort to reinforce this expectation. Piggot-Irvine (2006) supports this notion suggesting that the “principal (and to a lesser extent other leaders) have a significant impact on the climate for development in a school. They can more broadly determine a culture for development where collaboration and collegiality are the norm” (p. 480).

As an organisational culture is developed to support the development of those within, attention must shift to what is being developed. To achieve this, Timperley et al. (2007) suggests that active leaders set visions where “better outcomes for students are linked to professional learning goals, student achievement targets, and more general school goals” (p. xxxi). Taking the contemporary view that leaders lead from the centre (Fullen, 1999, cited in Harris, 2003), this vision must be developed in a collaborative manner. In doing so, stakeholders are not only more inclined to ensure the success of the established goals, they are also empowered to evaluate and reflect on their part in the success of the vision. With leaders and teachers having collective input into, and a shared awareness of, organisational visions, goals, and targets, greater coherence of development and understanding is more likely (Timperley et al. 2007).

Having established a culture of learning, at a more practical level, Piggot-Irvine (2006) suggests leaders must also provide purposeful, needs based,
focused, coordinated and effective resources to achieve collaboratively developed goals. This position is supported by the findings of Timperley et al. (2007) who note that in cases of successful teacher professional learning and development “Most frequently, leaders ensured organisational arrangements were put in place that provided teachers with opportunities to learn, access to relevant expertise, and opportunities to meet to process new information” (p. xxxi).

### Figure 2.2 – Leading professional development for teachers

Figure 2.2 presents a synthesis of the literature relating to the leadership of professional development for teachers. This framework is an interpretation of the various ideas around professional development and aims to identify the relationship between associated functions and key elements. This framework guided the research and provided a point of reference for the development of recommendations for the cluster schools leadership to assist them in developing a professional development programme for teaching thinking for understanding. Much like the
framework outlined in Figure 2.1, the layout of this table aims to highlight how each component of leadership must be considerate of the broader context it exists within. That is, a professional learning programme requires clear organisational goals as discussed by (Timperley et al., 2007; Fullen, 1999, cited in Harris, 2005). These goals must be developed within a culture of professional learning as noted by Piggot-Irvine (2006). Finally, various leadership styles appropriate to the vision and goals must be considered as outlined by (Bottery, 2004; Bush, 2003; Harris, 2005; Southworth, 2004; Woods et al. 2004).

**Conclusion**

Having reviewed the literature in relation to teaching thinking for understanding, a curriculum framework (Figure 2.1) has been established. This framework provided the basis for the theory to practice gap analysis discussed in Chapter Five based on the findings in Chapter Four. To enable the development of recommendations for a professional development programme to address a theory to practice gap, educational leadership literature was reviewed and presented as a model to compare with current leadership practice as it relates specifically teacher development. Chapter Five discusses the implications of this theory for school leaders as it relates to their efforts to prepare their teachers to deliver a curriculum where teaching thinking for understanding is the goal.
Chapter 3
RESEARCH METHODOLOGY AND METHODS

Introduction

The central aim of this study was to examine the educational leadership required to develop teachers understanding of a thinking curriculum within primary education. As was shown in the previous chapter the notion of ‘thinking’ as a curriculum is extremely complex and opinions vary considerably regarding approaches, content and supporting pedagogies. Thus, this study sought to define a thinking curriculum, check the current understanding of this ideal and identify the required leadership to align these.

This chapter discusses the evolution of social research as it relates to educational research conducted presently, in an effort to better understand the defining elements inherent within qualitative and quantitative methodologies. In turn the use of a qualitative approach as an appropriate methodology for this study has been identified and rationalised. This leads to an exploration of a small scale qualitative case study as a suitable strategy for this research whilst acknowledging the associated limitations. Accompanying this, the process for selecting the case study schools is outlined to help frame the research context. To conclude, data gathering and analysis methods are outlined and justified with reference to their ability to address the issues of data reliability and validity followed by a discussion on the ethical considerations of such a study.
Educational Research

Social and more specifically ‘educational research’ methodologies can be traced back to the late nineteenth century with the emergence of the child study movement (Keeves, 1997). This early, quantitative study laid the foundation for educational research conducted throughout the twentieth century and on to present day. De Lansheere (in Keeves, 1997) suggests this moment in history can be divided into four distinct periods each with its own epistemological underpinning and each contributing to the current movement in which both a post-positive and an interpretive stance are seen as necessary and complimentary. Creswell (2002) suggests that the “situation today is less qualitative versus quantitative and more how research practices lie somewhere on a continuum between the two” (p. 4).

The initial social science paradigm adopted a positivist perspective, characterised by the application of ‘scientific’ methods to research social realities (Bryman, 2004). During the 1930’s questions were raised over the ability of quantitative methodologies to answer more philosophical and progressive questions regarding education where phenomena were not necessarily quantifiable (De Landsheere in Keeves, 1997). These questions were provoked by feelings that education was not atomistic and therefore associated research could not be conducted as such.

The impact of these questions on positivist research was not one of domination and defeat; rather it bought about the post-positivist movement, which bore the effects of the more socially based humanistic influences. By the 1960’s this debate was formalised and interpretivism with new ontological and epistemological beliefs challenged the positivist way of doing research. Opponents of the positivist paradigm challenged the deductive and mechanical nature of such research. Positivism’s failure to acknowledge such human behaviours as will, intent and agency (Cohen, Manion and Morrision, 2007), left many arguing that positivism lacked worth in enhancing understanding of human behaviour.
Interpretivists suggested that empiricism gave very little consideration, if any, to the “multi-faceted aspects of human behaviour and all its environment-bound subtle nuances” (De Landsheere in Keeves, 1997, p. 9). The emerging qualitative movement aimed to adopt a multidisciplinary approach utilising research methods from numerous disciplines including anthropology, sociology, history and linguistics (Keeves, 1997). As research became more considerate of these humanistic elements the need to make sense of the interrelationships inherent in educational settings became an influencing factor in research design.

By the 1990’s the debate shifted focus once again and it was accepted that the answer to educational research was no longer positivist versus interpretivist, rather it was a case of the scientific complimenting the humanistic (Creswell, 2002; De Landsheere in Keeves, 1997; Husén, 1997). This new perspective initiated discourse with regard to the respective merits and limitations of qualitative and quantitative methodologies with some suggesting both were equally important and somewhat indistinguishable (Layder, 1993, cited in Bryman, 2004). However Bryman (2004) suggests otherwise by insisting that the distinction provides a useful vehicle for classifying different social research methods.

Quantitative and Qualitative Research

Quantitative and qualitative methodologies hold different ontological perspectives. The former assumes the objective position that social phenomena exist externally or independently of the people within it. That is, the organisation holds a set of jobs, processes, traditions and functions at its core that are imposed and in the extreme those within the organisation who don’t conform to these phenomena may face punitive measures. If this is the belief of the researcher then it is likely the focus of study will be on the systems and structures of an organisation.
Conversely qualitative research holds the constructivist or constructionist view that social phenomena are produced and constantly influenced by the people within it. This notion has been extended further in recent years to include the idea that the social researchers interpret the research from their own worldview perspective challenging some to regard this kind of research as definitive. This view has also come at a time when the notion of knowledge as fixed is being challenged. The constructivist would suggest, “knowledge is viewed as indeterminate” (Bryman, 2004, p. 17).

As stated earlier this study aimed to identify the leadership required to develop teachers’ understanding of a multifarious and ever evolving ‘thinking curriculum’. Theories in both educational leadership and learning and teaching are developing constantly and our knowledge of what is considered ‘best practice’ in either area can only be considered as pertinent at a particular point in time. The ongoing evolution of theories in these fields suggested that a qualitative approach to this research was necessary as the people within each of the participating organisations were contributing to and influencing their very development.

Although a qualitative approach satisfied the ontological and epistemological positions relative to this study consideration was given to the criticisms of this type of research. Perhaps of most importance was the fact that conclusions drawn from this study could be considered restricted (Bryman, 2004; Cohen et al., 2007). By this it is meant that the findings of this research could not be “generalised to other settings” (Bryman, 2004, p. 285) as they centred on only five schools. Although an important consideration, it was not the intention of this study to generalise or apply the findings to all school settings; rather the findings were for possible use by those leaders within the participating organisations to develop a plan for development informed by the research.

It is this notion of ‘findings’ that raised another important consideration. The qualitative researcher should be aware they are unable be totally objective. It is their interactions with others and their own background that
shapes their interpretation and in turn ‘positions’ themselves in the research (Creswell, 2002). With this in mind the interpretive nature of this study posed an interesting challenge. This was problematic in the sense that understandings of phenomena should be “from the participants’ perspectives, not the researcher’s” (Merriam, 2009, p. 14). In acknowledging this issue, it is worth noting that as the leader of one the participating organisations this research was somewhat ethnographic. Ethnography has its roots in anthropology and characterises the study of “human societies, institutions and social relationships by getting ‘inside them’.” (Wellington, 2000, p. 44). The consequences of being an ‘insider’ required careful consideration as the issues of influence and ethical research were substantial. These issues are discussed later in this chapter however it is important to identify at this stage that ‘insider’ knowledge has undoubtedly contributed to the framing of this study and, in turn, interpreting it.

As thinking in education is continuously being researched and developed to ascertain best practice (Fisher, 2005; Lipman, 2003; Ritchhart, 2002; Swartz et al., 2008) with teachers and school leaders very much involved in constructing and leading this emerging pedagogy, research in this area must be considerate of the different perspectives held by those involved. Qualitative research satisfied the needs of the constructivist ontology (Bryman, 2004) and humanistic epistemology (De Landsheere in Keeves, 1997) inherent in this study. It provided an approach that considered the humanistic perspective requiring interpretation, whilst acknowledging that those involved in the research participate in creating the reality they exist within. In order to identify the educational leadership necessary to develop teachers’ understandings of thinking for understanding within inquiry this study aimed to identify the current reality as it compared with identified theory and made recommendations for development. It is these recommendations that will inform the development of appropriate leadership practices.
Small Scale Qualitative Case Study Design

The rationale of this research problem took its cues from the propositions contained within current literature around thinking curricula along with the educational leadership necessary to develop teacher understandings in this area. Thinking curriculum models and educational leadership theories associated with teacher development were reviewed to create an ‘ideal’. This ideal provided the basis for the development of a set of criteria, or “dimensions of merit” (Davidson, 2005, p. 23), that focused data collection around current teacher and leader understandings and experiences. The findings as presented in Chapter Four and discussed in Chapter Five provide a clear picture of the current theory and practice gap with regard to teacher understanding of thinking curricula within inquiry and the educational leadership enacted thus far to develop it.

Since the aim of this study was to understand and explain the current situation, as it existed for the five cluster schools, and in turn offer recommendations for future development, a small scale qualitative case study strategy was most appropriate. Merriam (2009) states that the purpose of case study evaluation is to establish a basis for decision-making (the recommendations) and Bryman (2004) suggests case studies in general should involve an extensive examination of a specific location or setting (the cluster schools). The evaluative nature of this study is well justified by Davidson (2005) who suggests that:

- Evaluation is something that prudent individuals, groups, organisations, and countries make a point of doing as part of good quality management. It is the only way in which to accomplish the following:
  - Find out whether the resources we pour into something (including our blood, sweat, and tears) are really yielding the greatest possible benefit;
  - Help a new product, program, or intervention find its feet; and
• Avoid reinventing the wheel (perhaps even a wonky one) because we did not bother to learn from our own (and others’) successes and failures. (p. 20)

Merriam (2009) specifies that a bounded system must be the unit of analysis to necessitate the use of a case study. The bounded system in this study has a certain duality to it. Whilst focusing on teacher understandings of a thinking curriculum, this study also focused on educational leadership necessary to develop understandings relating to this curriculum. Although these units of analysis could be studied independently the intention of this study was to understand the theoretical base of each unit clearly and in turn compare this to the current case to ultimately guide the development of recommendations.

The case in this study involved five schools as (shown in Table 3.1) each with its own set of values and beliefs. There were three types of school involved in this study; contributing, full primary and intermediate. The type refers to the year levels catered for by each school as indicated in the table below. Further to this the five schools cover a wide range of deciles. A decile is an indicator generated by census data to indicate the socioeconomic status of each schools local community. The government uses this indicator to establish the degree of school funding. Simply put, the lower the decile, the greater the government funding.
<table>
<thead>
<tr>
<th><strong>School Label</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>School One (S1)</td>
<td>State Contributing Primary school (Years 1-6) Suburban Roll 278 Decile 5</td>
</tr>
<tr>
<td>School Two (S2)</td>
<td>State Contributing Primary school (Years 1-6) Suburban Roll 328 Decile 4</td>
</tr>
<tr>
<td>School Three (S3)</td>
<td>State Intermediate School (Years 7/8) Suburban Roll 457 Decile 6</td>
</tr>
<tr>
<td>School Four (S4)</td>
<td>State Full Primary (Years 1-8) Semi rural Roll 254 Decile 10</td>
</tr>
<tr>
<td>School Five (S5)</td>
<td>State Full Primary (Years 1-8) Suburban Roll 402 Decile 7</td>
</tr>
</tbody>
</table>

*Table 3.1: Participating Schools*

The complexities buried within this study required an approach that allowed the research to be conducted in such a way that complex social phenomena could be understood (Yin, 1994). The exemplifying case (Bryman, 2004) to be understood here could potentially be considered a multiple site case study due to the number of schools involved. However, these schools were working together as one on a New Zealand Ministry of Education contract as part of the Enhancing High Standards Across Schools (EHSAS) initiative. This is otherwise known as an ‘EHSAS cluster initiative’ and as such the research centred around the collective thoughts and processes of these organisations. Although some cross-school comparisons were made, the main aim of this study was to determine the collective gap in teacher understandings and to identify the necessary educational leadership to address this. Therefore this study was conducted, and consequently presented, as a single site case study.
Data Collection Methods

With this case study being based on a pre-established group much of the work with regard to sampling and gaining access was eliminated. The majority of time at this stage was spent determining what was to be collected and how. Questionnaires and focus group interviews were the methods used in this study. By combining these methods both broad themes and specific issues could be explored over a wide population.

Questionnaire

The initial method of data collection was a questionnaire (Appendix A) issued to a population consisting of all classroom teachers and school leaders (approx 80) in the EHSAS cluster. A questionnaire was suitable at this stage as it gained both qualitative and quantitative information from a wide population over a large geographical area allowing generalisations to be made for further investigation (Hinds, 2000). Further to this, the lack of interviewer variability inherent in questionnaires ensured that initial data was less biased (Bryman, 2004). The information sought in the questionnaires was general and less complex than that of the planned subsequent focus groups. The purpose of the questionnaires was to identify general themes surrounding thinking for understanding and leadership of teacher professional development. These themes were then woven into focus group sessions to gain more detailed responses where applicable.

To ensure maximum response rates, the questionnaires were issued by the principal of each school at the beginning of a scheduled staff meeting and collected back immediately upon completion. The collected questionnaires were then inserted into a self-addressed envelope and posted directly to me ready for collation. In my own school the deputy principal issued, collected and posted the questionnaires in my absence.
This took place over a two-week period with all questionnaires ultimately returned to my home address.

Although the questionnaire provided useful preliminary data, it was necessary to be mindful of the limitations that this type of data collection presented. Of particular relevance in this case was the inability to probe further. The topic of this research was highly subjective and in an effort to gain useful responses, the risk of over simplification was ever present. To address this it was necessary to balance the use of open and closed questions in the questionnaire. Too many open questions would have reduced the quality of responses, as participants don’t typically like writing a lot (Bryman, 2004). Too many closed questions and the data would not have provided useful insights for further investigation in the focus group phase.

The final concern was the lack of opportunity to prompt respondents if they were having difficulty answering questions or understanding the questionnaire. This raised the issue of design. Great care was taken to ensure the final questionnaire was easy to complete and that questions were clear and unambiguous (Jenkins, 1999). Piloting the questionnaire using individuals outside of the study ensured this. One copy was sent to a fellow principal and another two copies were sent to teachers at a local school not involved in the study. Feedback was gained from these individuals and only minor changes were made at this time. The first change was to include in brackets ‘(if any)’ in question five as this allowed for a nil response if the participant felt thinking was not a necessary programme component. The other change involved adding the word ‘briefly’ to question fifteen to keep answer specific as it was felt responses could end up very drawn out and detailed.
Focus Group Interview

The subsequent method of data collection was through focus group interviews consisting of five to six teachers from each of the five schools plus one group made up of the school leaders (shown in Table 3.2). The sampling method used to select these participants is outlined in detail in the following section.

The focus group interviews involved a thorough exploration of the research questions in addition to themes identified in the questionnaires to gain a deeper understanding of teachers and principals’ experiences and thoughts. Hinds (2000) suggests that focus groups are used “to gain information relating to how people think; to explain perceptions of an event, idea or experience; when there is a desire for more understanding of the human experience; and when seeking the perspective of the client” (p. 50). To allow some time to consider their thoughts and provide more in depth responses participants were provided with the interview questions prior to the focus group interviews. (Appendix B Teachers, Appendix C Principals)

<table>
<thead>
<tr>
<th>Focus Group</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus group 1 (F1)</td>
<td>6 Teachers (T1A-F)</td>
</tr>
<tr>
<td>Focus group 2 (F2)</td>
<td>5 Teachers (T2A-E)</td>
</tr>
<tr>
<td>Focus group 3 (F3)</td>
<td>6 Teachers (T3A-F)</td>
</tr>
<tr>
<td>Focus group 4 (F4)</td>
<td>6 Teachers (T4A-F)</td>
</tr>
<tr>
<td>Focus group 5 (F5)</td>
<td>5 Teachers (T5A-E)</td>
</tr>
<tr>
<td>Focus group 6 (F6)</td>
<td>5 Principals (P6A-E)</td>
</tr>
</tbody>
</table>

Table 3.2: Focus Group Participants

As one of the major research concerns was to do with teacher understanding, the opportunity to have an open discussion amongst peers
that a focus group affords, was more appropriate than individual interviews as it allowed participants to reflect on one another’s comments generating more considered responses (Bryman, 2004). These focus group interviews all took place at each of the respective schools at a time that best suited the participants. The principal group met at café with a private outdoor area. A digital voice recorder was used to capture the interviews. This allowed me to download the recordings directly on to my laptop for transcribing. Upon completion, archive copies were burnt to CD and all remaining copies were destroyed. At the commencement of each focus group interview participants identified themselves for transcription purposes however all identities were concealed through the use of codes when publishing transcripts.

Upon completion the focus group interviews were transcribed to allow a qualitative analysis of responses. These transcripts were passed on to participants within two weeks of each interview for review. No discrepancies were raised at this time. After confirming the accuracy of the transcripts, common themes, understandings and meanings were identified through coding and analysis and specific quotes were identified to support these findings (Lofland, Snow, Anderson & Lofland, 2006). The data gathered from these focus groups was used in conjunction with the questionnaire data to pinpoint differences between current theory and practice (Robinson, 1998). These differences provided much of the information used to develop recommendations for the cluster of schools at the conclusion of this small scale qualitative case study.

**Participant Sampling**

With both means of data collection, consideration was given to who was involved and how they were selected. Initially, in the case of the questionnaire, all teachers and school leaders in the cluster schools participated. As there was no selection process this was a non-probability sample consisting of the teaching and leadership population across the
cluster. This was a convenience sample as it involved all members of the cluster engaged in the case study (Bryman, 2004). This clearly raises ethical issues around informed and voluntary consent, which are addressed in the last section of this chapter.

With regard to the focus groups, a probability sample was used which ensured a lack of bias when conducting these in-depth discussions. As there was a risk of school leaders putting forward perceived skilled practitioners to make their school look like they were ‘ahead of the game’ a stratified random sample was generated using three identifying groups (Bryman, 2004). Junior (years 1-3), middle (years 4-6) and senior (years 7/8) school teachers. Depending on the type of school, varying numbers were taken from each of these groups to form focus groups of five or six members. Contributing schools required three members from both junior and middle school groups. Full primary schools required two members from each of the groups and intermediate schools only required five members from the senior group. This ensured the complete teaching population of each school was represented. Like the questionnaire, the focus group consisting of school leaders was a non-probability, convenience sample.

**Data Analysis Process**

The research methods discussed above generated three distinct types of response as outlined below (shown in Table 3.3).

<table>
<thead>
<tr>
<th>Tool</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionnaire</td>
<td>Likert Scale</td>
</tr>
<tr>
<td></td>
<td>Qualitative, Written</td>
</tr>
<tr>
<td>Focus Group</td>
<td>Qualitative, Verbal</td>
</tr>
</tbody>
</table>

*Table 3.3: Response Type*
Each type of response required a different approach to make meaning of the data. With the Likert scale data from the questionnaires, a numbered table was created to correspond with the questionnaire items. A manual count of responses from each school was conducted and a table was completed for each. This data was then entered into a spreadsheet. This allowed the data to be analysed in a variety of ways.

- Response to questions by each focus group
- Response to questions collectively
- Response to questions by cohort and each focus group or collectively

In doing this, the degree of positive or negative response could be observed. To record these findings another table was created into which the question number and the corresponding response for each group was recorded both collectively and by cohort. This table was then printed and highlighted where major themes were evident. Each of these areas was then labelled to identify the dominant themes.

The written responses required a far more labour intensive process. Firstly each questionnaire was read through and key words that linked directly to the research questions were highlighted and a plus or minus sign was placed alongside to indicate a positive or negative response. Next key words were recorded by school and then organised into a table with each question number and a positive and negative column. Once completed these were placed alongside each other to identify common themes across the cluster and to highlight anomalies.

Finally the transcripts required a very structured approach to identify the essence of each interview. Transcripts were personally typed providing very intimate knowledge of the contents of each interview. As a consequence initial impressions within and across the interviews were gained. To make the most of this a document was established to record anything of significance as it became apparent (Bryman, 2004; Cohen et al., 2007). This process is otherwise known as memoing (Merriam, 2009).
Once complete each transcript was read and in doing so any common phrases or words were identified. Whilst doing this any poignant statements were highlighted for possible use in Chapters Four and Five. Initially a list of random words was created. Broad categories to group these under were then identified. Merriam (2009) states “it should be remembered that I see category the same as a theme, a pattern, a finding, or an answer to a research question” (p. 178). Having grouped these terms into major categories, minor themes embedded within each of these areas that were emerging from the texts were considered. This ultimately led to the creation of a taxonomy as suggested by (Bernard and Ryan in Denzin & Lincoln 2000) highlighting the major ideas present in the interviews with a layer of minor ideas connected to each.

To assist this process, words were coded in a way that was derived from the data. Rather than come up with a list of words, colours were used to identify similar words. Terms were then established that captured the main idea of each colour. Cohen et al. (2007) stress “A code is a word or abbreviation sufficiently close to that which it is describing for the researcher to see at a glance what it means” (p. 478). Although a lengthy process it proved quite intuitive and relatively free of bias, a declaration that raises the issue of reliability and validity of data.

**Reliability and Validity of Data**

Two criticisms have plagued the qualitative researcher for some time now. One is that of reliability being “the extent to which research findings can be replicated” (Merriam, 2009, p. 220) and the other being validity. Validity in this instance is concerned with the integrity of the data through measures such as “careful sampling, appropriate instrumentation and appropriate statistical treatments of the data” (Cohen et al., 2007, p. 133). The issue of reliability is discussed at length with regard to the use of case study design. This discussion does not concern itself so much with whether or not we can replicate the findings of one case study to another; rather the
question seems to be should we. The rhetoric around this issue is borne out of the positivists desire for accuracy and replication of findings (Merriam, 2009). Indeed those who believe in the qualitative process give it little mention at all (Bryman, 2004).

The issue of validity however requires more consideration. If qualitative research is to be taken seriously it must show that findings can be sustained by the data (Cohen et al., 2007). To ensure that in this study the data and in turn the findings were valid the following considerations were made; participant confirmation, triangulation of data, establishing an audit trail and objective coding (McTaggart, 1999).

The first area of consideration around participant confirmation involved checking the accuracy of data being used for analysis by participants. This ensured that conclusions were drawn from factual accounts. In this study transcripts were returned to participants within two weeks of the focus group interviews and participants were asked to correct any factual errors. In this instance no corrections were necessary.

Triangulation of data was concerned with looking at interpretations through the lenses of multiple stakeholders and multiple data collection methods to get a sound cross section of data informing conclusions. As previously outlined in Table 3.3 various types of responses were collected from a wide population as illustrated in Table 3.1. These responses were analysed and compared to identify consistent themes as evident in Chapters Four and Five.

In order for research to be replicated an audit trail of sorts must be outlined. This chapter serves that purpose by providing a thorough description of the research process. Bryman (2004) suggests that recording and articulating the research process by which conclusions were drawn the study can be replicated. It must however be accepted that with case studies such as this the ultimate findings may differ as they can only be taken as a point in time.
The final area of consideration was around the issue of data coding. So as not to influence the data, methods that were inductive in nature were used. This process has been outlined above to provide evidence of the efforts made to avoid influencing the findings during the coding of the data.

Having taken measures to ensure this study was both reliable and valid it was important to consider the participants as subjects of observation and the implication of this.

**Ethical Issues**

To ensure this study was ethically sound an application was made to the UNITEC ethics committee. Approval was granted on the grounds that the following issues were given due consideration and appropriate measures were in place to address them. This research had three significant areas needing ethical consideration. These were a multi-dimensional conflict of interest on the part of the researcher as an insider researcher, confidentiality and anonymity, and informed and voluntary consent. The conflict of interest was due to the researcher being a principal within one of the participating cluster schools. Further to this the cluster was part-funding the study leave provided to complete the research. Finally the cluster had been consulted to ensure the research topic addressed the needs identified in the EHSAS application.

To ensure that the conflict of interest was addressed it was important to ensure that where possible participants were randomly selected, well informed about the research, and provided consent voluntarily without any sense of obligation or pressure particularly in the researchers own school. No-one declined to participate in this study and the use of stratified probability sampling (Bryman, 2004) for focus groups went some way to addressing the selection concerns.
A major concern for participants under these circumstances could have been confidentiality and anonymity. In an effort to address these issues the following protocols were used. All questionnaires were completed anonymously and returned by way of a self-addressed envelope for each cluster school. As mentioned earlier, this process was managed by the deputy principal in my school to ensure confidentiality and anonymity were maintained. With regard to the focus group interview within the insider researcher school an external interviewer was utilised. Further to this all responses included as quotes were coded to hide identity. All questionnaires and transcripts were secured off-site of any of the cluster schools. Finally all respondents were required to give informed consent before involvement in either phase of the research. In the case of my own school the deputy principal in my absence conducted this process. These protocols for anonymous involvement, secure storage of data, and non-identifying reporting practices were shared with participants as part of the consent process to address any concerns (Wellington, 2000). In making these considerations the ethical principles of reducing harm, informed consent, minimising invasion of privacy and deception (Bryman, 2004) were all addressed.

**Conclusion**

This chapter has outlined the historical significance of qualitative research and in doing so substantiated the use of it as an appropriate methodology for this study. It has provided a clear outline regarding how the research was conducted to ensure reliability concerns are addressed. Further to this, data collection methods have been explained and their ability to provide valid data justified. Finally ethical considerations have been discussed to ensure participant safety. The following chapter offers a presentation of the data collected.
Chapter 4
RESEARCH FINDINGS

Introduction

This chapter provides an overview of the findings as they relate to the research questions outlined in Chapter One. Highlighted throughout this chapter are the key themes identified in the data analysis. This chapter concludes with a summary of the main research findings for discussion in the subsequent chapter.

Data Organisation and Presentation

As outlined in the previous chapter, two key methods were used to gather research data. A self-completion questionnaire was issued and filled out by all members from each of the five case study schools, including anyone deemed to hold leadership responsibilities. Following this, a focus group interview with a stratified random sample of teachers was conducted in each of the five schools along with an additional focus group interview with the five principals.

The questionnaire contained both written response and Likert Scale responses. Questions were organised so that initial responses were generally on a quantitative scale and where appropriate were supported by written responses to gain further clarification or a deeper understanding of participant viewpoints. The focus group questions supported this deeper
examination of participant responses. In both the questionnaire and the focus group interviews the questions progressed in keeping with the key research questions.

With regard to the questionnaire, initial questions were designed to gain insight into teachers’ and leaders’ current beliefs and practices regarding teaching thinking for understanding, which in turn, provided the necessary data to identify the current theory practice gap. As the questionnaire progressed, leadership of teacher professional development became the focus. These leadership questions provided data for the development of recommendations for the cluster schools as discussed in Chapter Five.

The research findings are organised under the headings; demographics; thinking for understanding as a necessary part of schooling, alignment of teacher practice with the espoused definitions of thinking, inquiry and understanding within the school context; conditions that must exist in schools to make thinking for understanding a fundamental part of learning; and leading a professional development (PD) programme for teachers in thinking for understanding within inquiry. These headings were derived from the research questions stated in Chapter One in conjunction with the organisation of participant responses.

**Results and Analysis**

**Demographics**

Questions one and two of the questionnaire were both demographic questions relating to the participants position within their respective schools. Tables 4.1 and 4.2 summarise this data.
With a total of 79 participants overall the percentage of participants from each school ranged from 13% (S4) to 27% (S3). With a mean school size of 16 participants, all five schools were very close to this average with the maximum deviation being in schools S3 and S4 with a difference in the number of participants between the school total and the mean of five and six respectively.

With regard to the number of participants in each year level, a similar number of teachers were evident in each. Teachers in years 1-3 made up the largest group (29 participants) largely due to the lower student to teacher ratios at this level consequently producing more classes from the same number of students.

School leaders made up the smallest group in the research by far. They made up only 10% of the total number of participants across all the cluster schools combined. For the purposes of analysis those participants who identified themselves as non-teaching management or principal were combined under the label ‘school leaders’. Individual school group information provided was deliberately omitted to avoid compromising anonymity.

<table>
<thead>
<tr>
<th>School</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>13</td>
</tr>
<tr>
<td>S2</td>
<td>16</td>
</tr>
<tr>
<td>S3</td>
<td>22</td>
</tr>
<tr>
<td>S4</td>
<td>11</td>
</tr>
<tr>
<td>S5</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
</tr>
</tbody>
</table>

*Table 4.1: Total participants in each school*

<table>
<thead>
<tr>
<th>Groups</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher years 1-3</td>
<td>29</td>
</tr>
<tr>
<td>Teacher years 4-6</td>
<td>21</td>
</tr>
<tr>
<td>Teacher years 7-8</td>
<td>21</td>
</tr>
<tr>
<td>Non-teaching management</td>
<td>3</td>
</tr>
<tr>
<td>Principal</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
</tr>
</tbody>
</table>

*Table 4.2: Participant groupings*
Focus group demographics are outlined in Table 3.2 in the previous chapter. In summary though focus groups consisted of either five or six participants, each with a cross section of group members where possible. The following reports the findings of the questionnaire and focus group questions as they relate to ‘teaching thinking for understanding within inquiry’.

**Thinking for understanding as a necessary part of schooling**

As shown in Graph 4.1 the vast majority of teachers (58%) stated that they totally agreed that a focus on thinking was necessary in today’s schools and another 41% stated that they agreed. In the case of school leaders, affirmative responses were even greater with seven out the eight participants’ totally agreeing that this should be a focus.

![Graph 4.1: Relevance of a Focus on Teaching Thinking](image)

In both the written responses and the focus group responses, preparing children for an unknown future in which many new problems are likely to exist and where information will be readily available, was a consistent
theme (42% written responses) with the following focus group participants commenting that:

We’re now educating children not with information but with the skills to deal with the world they’re going to go into in the future (T4B).

With so much information available at your fingertips now it’s what you do with it rather than what you hang onto in your head (T1B).

We don’t know what problems the children will encounter when they are older so we need to develop skills that help them think about them (T5D).

If our kids can think better they’re going to be able to contribute better to a democratic society, make better decisions and have a happier life (P6C).

In addition to this issue of information overload one participant touched on the DeBoo’s (1999) notion that knowledge can no longer be considered constant.

The days of filling kids heads up with a bunch of facts are over. There’s too much new information available every day now and it keeps changing. I mean Pluto’s not even a planet any more (T5B).

Offering a possible solution to address this uncertain future, one participant wrote:

A modern democratic society requires skilful thinkers who can participate in complex decision-making.

With such an apparent certainty regarding the need to teach thinking, as highlighted above, the next research question aimed to uncover current
teacher and leader understanding of the educational theory surrounding this field.

**Alignment of teacher practice with the espoused definitions of thinking, inquiry and understanding within the school context**

Participants were asked in both the questionnaire and during the focus group interviews to describe the types of thinking they thought children should be taught to aid them in developing deep understandings. The answers varied considerably in terms of content, terminology and specificity. Responses were sorted into three lists as presented in Table 4.3. List A contains the most common responses throughout the entire case study population, list B contains responses that although not as common as list A were answers that were given at least once within each school. Finally list C presents responses that were inconsistent within each school and between each school.

<table>
<thead>
<tr>
<th><strong>List A</strong></th>
<th><strong>List B</strong></th>
<th><strong>List C</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical thinking</td>
<td>Skilful thinking</td>
<td>Predict</td>
</tr>
<tr>
<td>- 79%</td>
<td>- 42%</td>
<td></td>
</tr>
<tr>
<td>Creative thinking</td>
<td>Decision making</td>
<td>Reflect</td>
</tr>
<tr>
<td>- 62%</td>
<td>- 37%</td>
<td></td>
</tr>
<tr>
<td>Problem Solving</td>
<td>Part Whole</td>
<td>Judgement</td>
</tr>
<tr>
<td>- 55%</td>
<td>- 28%</td>
<td></td>
</tr>
<tr>
<td>Compare and contrast</td>
<td>Inquiry</td>
<td>Synthesis</td>
</tr>
<tr>
<td>- 52%</td>
<td>- 25%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Questioning</td>
<td>Analysis</td>
</tr>
<tr>
<td></td>
<td>- 21%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Define</td>
<td>Sequence</td>
</tr>
<tr>
<td></td>
<td>- 18%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause and effect</td>
<td>Evaluate</td>
</tr>
<tr>
<td></td>
<td>- 18%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOLO Thinking</td>
<td>Deep thinking</td>
</tr>
<tr>
<td></td>
<td>- 15%</td>
<td></td>
</tr>
</tbody>
</table>

*Table 4.3: Types of thinking children should be taught to develop deep understandings.*

Critical thinking was the most overwhelming term that came to mind when participants were asked to express what type of thinking they believed should be taught. With 79% of all participants using this term in some form throughout all the cluster schools it was clear that critical thinking was considered to be of great importance. Creative thinking, problem solving and comparing and contrasting were the only other three terms that received a mention by a significant number (over 50%) of participants in all schools.
A clear finding illustrated by Table 4.3 was the breadth of terms. Lists B and C showed an increasing range of terms as the responses became less common. This provided evidence of an underlying issue of shared language, or lack thereof. Key terms such as those in list A were apparently well entrenched, however beyond this there was a plethora of disconnected and unrelated terms used freely amongst many participants as evident in lists B and C.

When compared to Figure 2.1 from Chapter Two, Table 4.3 contains some relative similarities. Critical thinking was identified in Figure 2.1 as one of two key thinking dispositions along with creative thinking. As shown in list A these two terms were the most common responses to the ‘Types of Thinking’. This highlights participants’ awareness of the importance of these terms however as discussed in Chapter Five there is some misunderstanding regarding what constitutes a ‘type of thinking’. Further to this a number of responses highlighted more significant misunderstandings. An example of this was the mention of SOLO as a type of thinking.

SOLO is a completely different way of doing [thinking] and I’ve become really confused (T2A)

As discussed in Chapter Two, SOLO is a taxonomy of thinking behaviours or types that can be used to determine the degree of thinking a particular learning outcome requires. Another example of this misunderstanding was the use of the term inquiry as a type of thinking. Inquiry is a pedagogy, or an approach to learning. As outlined in Figure 2.1 ‘types of thinking’ occur within inquiry not as well as. Chapter Five fully explores this apparent issue of misunderstanding.

Having identified the types of thinking that participants thought children should be taught in school, teachers were then asked how confident they were in their ability to define/describe these types of thinking; how
confident they were in their ability to teach these types of thinking; and finally how well they believed they actually taught these types of thinking.

Graphs 4.2 and 4.4 present the associated responses and provide some evidence for the varied and diverse responses given in Table 4.3. In addition leaders (Graph 4.3) were also asked how confident they were in their ability to define the types of thinking they identified in Table 4.3. Of note here is the significant difference between the percentage of leaders (88%) who were confident or indeed very confident when compared with teachers (62%). In addition, 38% of teachers felt neutral toward their ability to define or describe thinking whilst only one leader felt this way. A clear misalignment between teachers and leaders confidence was evident here.
Of interest, when asked during the focus group interviews to define the terms previously identified many participants had difficulty with very few definitions (13 in total) ultimately being offered at all. This suggested that the confidence level (62% positive) shown in Graph 4.2 was perhaps somewhat unjustified. With this level of confidence one would have expected more concise and forthcoming definitions. Of those definitions that were put forward, some clear misunderstandings were evident. Here, two quite different definitions were offered for one of the most common terms used in all schools that was critical thinking:

**Critical thinking is having an opinion based on the facts, not just points of view (T4C).**

**Critical thinking is identifying the relevance of information (T3B).**

Graph 4.4 presents a worrying lack of confidence by the teachers in their ability to teach the thinking that they described and so strongly believed in. With 40% feeling neutral and another 3% feeling unconfident it appeared a significant theory to practice gap existed. The one exception to this trend
was seen in school S3 where the vast majority (85%) felt confident to very confident.

![Graph 4.4: Ability to teach identified types of thinking](image)

One teacher provided some insight into why teachers may have rated their confidence levels as they had. It would appear that their relative inexperience with teaching thinking meant they were unsure of how well they were doing:

*We’ve done lots. Because [thinking] iss all new to me I’m not completely comfortable with it or confident, but from [seeing] what my kids have done they’ve completely gone with it and they use it all the time for everything so I guess that means I have introduced it in the right way but I’d be interested to know how I could better it again (T2D).*

Another teacher seemed to suggest that there was room for growth in their teaching of thinking:

*For them to get better, I need to get better (T5B).*
Yet another teacher appeared to reflect on their practice during the interview and concluded that perhaps they were doing better than they initially thought:

> For me as a beginner I can see the changes in my children from term one to term four. They have progressed along a lot further than I thought and so have I actually (T3D).

Teachers identified no specific areas of confusion or misconception with regard to their understanding of teaching thinking. Rather, a common theme surfaced that suggested that due to the quantity of new ideas 18 participants noted they were feeling somewhat unsure of what was expected, as illustrated by the following two statements:

> The thing I can see is confusion and it’s confusion brought about by so many different things being brought to the table. You might be half way through a concept in your head and then someone else says “Have you tried doing this?” and then all of a sudden your brain sort of scrambles because of all the ideas coming in (T5B).

You go and see one person and you think “oh yes” and then you see another and think “oh no”. Part of what you see is suitable and over time we start to see what we can use at our school (1TC).

During the principals’ focus group interview however, the issue of shared language was raised as a specific area of confusion.

> Some of [the misunderstanding] is to do with language as we’ve discussed before. Understanding what people mean or common definitions for all these new words. We’ve even started a glossary to try and help with this (P6A).

It was somewhat curious that the teachers did not also identify this, as it was an issue that came through in the data presented thus far particularly
when they were asked to offer definitions for common terms and failed to do so.

The next series of data focuses specifically on the inquiry model present in each school. Participants were asked to state what the inquiry learning process (ILP) looked like in their school. Following this they were asked how well they believed inquiry facilitated the teaching of thinking whilst evaluating their own ability to teach using this model.

Table 4.4 summarises the five models adopted by each school. It is important to note that this table represents the most common language used to describe the inquiry process within each school. In each of the schools there was a great deal of variation in the language used. In no one case was there evidence of an absolute model with shared language used by all staff. Rather there appeared to be a general understanding of the key stages supported by similar language.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify prior knowledge</td>
<td>Front loading experiences</td>
<td>Awaken prior knowledge</td>
<td>Identify prior knowledge</td>
<td>Share fertile question</td>
</tr>
<tr>
<td>Develop questions</td>
<td>Explore prior knowledge</td>
<td>Construct key questions</td>
<td>Develop questions</td>
<td>Identify prior knowledge</td>
</tr>
<tr>
<td>Gather Information</td>
<td>Develop key questions</td>
<td>Plan the research</td>
<td>Gather information</td>
<td>Identify prior knowledge</td>
</tr>
<tr>
<td>Organise Information</td>
<td>Gather information</td>
<td>Collect relevant information</td>
<td>Identify relevant information</td>
<td>Refine questions</td>
</tr>
<tr>
<td>Identify and present new understanding</td>
<td>Share new information</td>
<td>Construct new knowledge</td>
<td>Identify relevant information that answers question</td>
<td>Research information</td>
</tr>
<tr>
<td>Reflect on new learning</td>
<td>Evaluate learning process</td>
<td>Share new insights and understandings</td>
<td>Reflect on learning</td>
<td>Present new understanding</td>
</tr>
<tr>
<td>S1</td>
<td>S2</td>
<td>S3</td>
<td>S4</td>
<td>S5</td>
</tr>
</tbody>
</table>

Table 4.4: Core components of the Inquiry Learning Process

Evident in this table was the overall commonality of the stages identified across the five schools. Although differing slightly in language and specific steps, all five schools appeared to follow a very similar process. The common steps were, framing the inquiry; exploring children’s prior knowledge of the subject and exposing them to supporting content material; formulating specific research questions; gather, interpreting and
applying research information; presenting new understandings; and evaluating learning experiences.

A possible reason for the lack of exact language used to describe this process may be the relatively short time the inquiry approach had been used in the case study schools. It would seem the process is still being refined as stated by one participant during a focus group interview:

_We used to have the last two [stages] around the other way. We used to have presentation at the very end. We reflected on our information and then delivered our presentation but we decided we had it around the wrong way and that we actually needed to deliver the [presentation] and then look back at what we’d done and say OK, where to now (T1B)._

This is supported by a participant from another school who states:

_In the beginning we had no framework so we floundered for a while until we figured out what was expected (T4E)._

Four out of the eight school leaders (Graph 4.5) felt ILP facilitated thinking extremely well with the remainder stating very well. The vast majority of teachers (68%) also felt the ILP supported teaching thinking very well with a further 18% selecting extremely well (Graph 4.8). Certainly the overwhelming consensus was in favour of ILP as a means to facilitate the teaching of thinking.
Much like the earlier results regarding teachers’ confidence and ability to teach thinking, a strong belief in the need to teach inquiry was not supported by a great deal of confidence in their own ability to facilitate such a pedagogy, as evident is Graphs 4.11 and 4.12 with just over 50% feeling confident and less than 10% feeling very confident in their ability to actually teach inquiry.
Having uncovered participants’ positive views regarding teaching thinking within inquiry, the next research question explores the conditions believed to be necessary to allow thinking for understanding to permeate all learning.
Conditions necessary in schools to make thinking for understanding a fundamental part of learning

In both the written questionnaire and the focus group interviews participants were asked to state what conditions they believed must exist in schools to make thinking for understanding a natural part of learning. Further to this, the written questionnaire asked participants to state to what degree they felt these conditions were already present in their schools. The focus group interview took a slightly different stance and asked how these conditions existed, that is, in what ways were they evident in the current culture of the school?

Table 4.5 provides a summary of the conditions that participants believed were necessary to make thinking for understanding a natural part of learning.

<table>
<thead>
<tr>
<th>Major Theme</th>
<th>Keywords/Phrases</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe/Trusting</td>
<td>Honest</td>
<td>You need to have confidence to express ideas even if they’re different from the status quo (T5C).</td>
</tr>
<tr>
<td></td>
<td>Sharing of ideas</td>
<td>Opportunity for discussion and asking questions and encouragement to do so (S5).</td>
</tr>
<tr>
<td></td>
<td>Flexible</td>
<td>Environments where staff feel happy to air concerns or discuss difficulties (T3A).</td>
</tr>
<tr>
<td></td>
<td>Accepting of opinions</td>
<td>I’ve done a thinking skills thing and it’s been atrocious, my kids have just about gone to sleep and I’ve decided that definitely wasn’t the way to do it but being allowed to do that and being allowed to say this is what I did and have no one tell me off (S1).</td>
</tr>
<tr>
<td></td>
<td>Risk taking</td>
<td></td>
</tr>
<tr>
<td>Professional Development (PD)</td>
<td>Access for all</td>
<td>Teachers know what thinking for understanding is and they have the PD to assist them to teach confidently (T5D).</td>
</tr>
<tr>
<td></td>
<td>Whole staff involvement</td>
<td>Development as a whole team. Not just some receiving all the PD in this area.</td>
</tr>
<tr>
<td></td>
<td>Quality</td>
<td>A desire to move forward and acknowledge a change in thinking/practice may be required (T2E).</td>
</tr>
<tr>
<td></td>
<td>Linked</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Modelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional reading</td>
<td></td>
</tr>
<tr>
<td>Successful Leadership</td>
<td>Clear/shared vision</td>
<td>Allows us to experiment and be creative (T4C).</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Supportive</td>
<td>Need to acknowledge and praise people who do good thinking (T3D).</td>
</tr>
<tr>
<td></td>
<td>Freedom to experiment</td>
<td>The leaders in this are need to have a good understanding of pedagogy with some supporting theory (T5A).</td>
</tr>
<tr>
<td></td>
<td>Opportunity to reflect</td>
<td>We all need to know what the vision is of what is required (T4F).</td>
</tr>
<tr>
<td></td>
<td>Change management</td>
<td>There needs to be a clear understanding of the thinking skills the school wants to focus on from management through to teacher aides so the students aren’t getting different messages from different adults (T4B).</td>
</tr>
<tr>
<td>Resources</td>
<td>Appropriate</td>
<td>In the junior school [children] always looked in books or on the internet and now they’ve branched out and found people in the community (T2D).</td>
</tr>
<tr>
<td></td>
<td>Available</td>
<td>School buildings need to be organised to allow flexibility (T5A).</td>
</tr>
<tr>
<td></td>
<td>Sufficient</td>
<td>Resources are huge factor in terms of books and computers if you want children to access information independently (T2B).</td>
</tr>
<tr>
<td>Shared Understanding/</td>
<td>Whole school approach</td>
<td>We’ve now become aware of looking at incorporating the skills, aspects, activities and specific thinking within our planning (T1E).</td>
</tr>
<tr>
<td>Language</td>
<td>Explicit</td>
<td>The language of thinking needs to be an integral part of the school culture (T2A).</td>
</tr>
<tr>
<td></td>
<td>Visual references</td>
<td>It should be a schoolwide learning process. All students must hear the same language in all curriculum areas and the same expectations must come from all teachers. The skills must be taught, reinforced and repetitive so the process can become second nature to all students at all times (T4A).</td>
</tr>
<tr>
<td>Learning community/culture</td>
<td>Consistent</td>
<td>We’re always asking how is that going to help you? How is that relevant? (T3C).</td>
</tr>
<tr>
<td></td>
<td>Infused in all areas of learning</td>
<td>A learning environment where all thinking is accepted. No right or wrong (T2E).</td>
</tr>
<tr>
<td></td>
<td>Clearly defined</td>
<td>We need PD for parents as well so they know what we are doing (T5D).</td>
</tr>
</tbody>
</table>

Table 4.5: Conditions necessary for teaching thinking

As shown in Table 4.5 six major themes emerged from this analysis. Trust, professional development, successful leadership, resource, shared
understandings and the development of a wider learning community were seen as essential components of a school where thinking for understanding was an intended outcome. These themes are shown in order of apparent importance as determined by the frequency of participant responses.

Trust was clearly the most important factor with 92% of responses stating that this, in some form or another, was essential to the development of a new curriculum where no clear expectations were yet fully established. Participants felt that they must be allowed to trial ideas and make mistakes during this time of new learning.

Of the written responses 86% made mention of the need for a quality professional development programme for all staff that was supported by sound theory and clear links to organisational goals. This was very strongly linked to the following theme of successful leadership. With 82% of responses stating the need for this, one could say that the success of the professional development programme and the leadership were seen as equally important in the development of a new curriculum.

Of the six major themes, resources, shared understandings and the development of a learning community were seen as less essential than the previously mentioned themes yet still significant in their own right. The need for appropriate resources was evident in 62% of all responses. The types of resources ranged from hands on materials for children such as actual "rock and soil samples" to additional personnel to support the time demands of inquiry learning and teaching.

The issue of shared understandings and language received a mention in 60% of all responses. As indicated by the heading of this theme, this issue centred around two major ideas. The first was the need for a shared language and the second was the need to have an understanding of this shared language. As highlighted in the quotes contained in Table 4.5 with
regard to this issue, the need for a shared language understood by all members of the learning community was seen as a clear concern.

Having identified this concern it was no surprise to see the need to develop a learning community emerge as the final major theme with just over half (54%) of all responses making reference to this issue. The language used in these responses aligned to the cultural indicators highlighted in Table 2.1 in Chapter Two regarding the environment being one of a thinking culture. There was a clear feeling that all aspects of school life should foster the development of thinking for understanding, ranging from classroom expectations, the language used by teachers with students and parents, the relationships between school and home and the opportunities for the community to understand what the school was aiming to achieve through a thinking curriculum and why. One participant provided an analogy that highlighted just how ubiquitous they believed thinking should be, stating that:

Thinking is like defensive driving; it’s not something you think right I’m going on a long trip I have to drive defensively. It’s just something you should be doing all the time (T3B).

As the focus of this research shifted to the leadership of such a curriculum, it was important to gain some indication of how well teachers and leaders believed the conditions outlined in Table 4.5 already existed in their schools. All eight leaders and 90% of all teachers felt that the necessary conditions were well in place to continue the development of this new curriculum.
Of interest here is the alignment between school leaders and teachers. Previous results have shown somewhat of a mismatch between the beliefs of these two groups. Here we see very consistent results. Of particular interest in Graph 4.9 is school S3. Of the five schools involved in this case study, S3 was the only one in which more teachers believed to a greater degree that the necessary conditions already existed in their school. This
Leading a professional development (PD) programme for teachers in thinking for understanding within inquiry

In both the questionnaires and the focus group interviews participants were asked to outline the PD they had participated in over the last five years with regard to teaching thinking within inquiry. With the exception of one school (S3) the majority of PD was facilitated by either the principal or another school leader. This was supplemented by attendance at various courses and/or conferences. Table 4.6 highlights the wide range of opportunities experienced by participants throughout the five schools.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conferences</td>
<td>One day workshops</td>
<td>Staff meetings</td>
<td>Cluster schools conference</td>
<td>Professional reading</td>
</tr>
<tr>
<td>One day workshops</td>
<td>Staff meetings</td>
<td>Cluster schools conference</td>
<td>Professional reading</td>
<td>Invited speakers</td>
</tr>
<tr>
<td>Staff meetings</td>
<td>Cluster schools conference</td>
<td>Professional reading</td>
<td>Invited speakers</td>
<td>In class guidance and support</td>
</tr>
<tr>
<td>Interschool observations</td>
<td>Professional reading</td>
<td>In class guidance and support</td>
<td>Teacher only days</td>
<td>Tertiary study</td>
</tr>
<tr>
<td>Cluster schools conference</td>
<td>Appraisal</td>
<td>Tertiary study</td>
<td>Teacher only days with trained educator</td>
<td>In school research</td>
</tr>
<tr>
<td>Professional reading</td>
<td>Teacher only days</td>
<td>Tertiary study</td>
<td>Teacher only days</td>
<td>Appraisal</td>
</tr>
<tr>
<td>Invited speakers</td>
<td>Tertiary study</td>
<td>Teacher only days</td>
<td>Teacher only days</td>
<td>Teacher only days</td>
</tr>
</tbody>
</table>

Table 4.6: PD opportunities in the teaching of thinking within inquiry

Common to all schools was the inclusion in their PD programmes of conferences, workshops, cluster schools conference, professional reading, in-class guidance and support, tertiary study and staff meetings. These common PD opportunities made up at least 80% of each schools PD programme. The remaining opportunities included invited speakers, teacher only days, appraisal and the use of trained educators (by one school). In only one school (S3) a long-term relationship had been developed with an overseas educator. This educator had developed a programme for infusing thinking to develop deeper understandings.
Participants from this school had worked extensively with this educator and as such the majority of PD was directly connected to this model. Beyond this significant difference, all five schools had experienced very similar PD programmes. Minor differences were evident in the actual conferences and workshops attended.

Having outlined the main components of the PD programme at each school, the vast majority (96%) of participants believed their experience had helped them improve their ability to teach thinking for understanding within inquiry, as shown in Graph 4.11.

![Graph 4.11: Impact of PD on ability to teach thinking for understanding](image)

With over 50% of participants feeling it had helped them to a great degree, and the majority of the remainder stating it had helped them to some degree, the issue of practical application of theory comes into question. That is, as mentioned earlier in this chapter, the number of participants who did not feel confident in their abilities to deliver a thinking curriculum was just under 50%.

Further to this observation, schools S1 and S2 had markedly less conviction (a mean of 27% stating a great degree against a mean of 65% in the remaining schools) from their participants regarding the overall
improvement bought about by their involvement in their respective PD programmes. Some clues to this are offered in their focus group interview responses. Participants were asked how they believed the relevant PD had helped them and how this programme might be improved. It seems a common thread was the feeling that the PD programme had been somewhat disjointed or disconnected as illustrated by the following statements:

New ideas don’t always seem to fit with the emerging model (T1B).

Even after I think I understand something, I see something else and I don’t know how they all fit together (T1A).

I find it hard to marry up all the bits. Since we’ve been introduced to SOLO I’ve become really confused because I can’t see what it has to do with what we’ve been doing (T2C).

I used to think inquiry was the same as thinking and now I’m not sure what I think (T2E).

The following quote came from a participant at school S4 and although this school appears to have a more positive feeling toward their overall improvement this statement identifies the same concerns raised above:

We lost the point of going to all these different speakers. It seemed like we were going to this one who was feeding us this and then this person is feeding us something different and I think it took a good while for us to see how all those threads came together and wove into something meaningful (T4D).

Apparently, compounding the problem, was the suggestion that a lack of clear communication between leaders and practitioners existed. One participant admitted:
I come out of staff meetings quite boggled when we do thinking. Sometimes I think it’s just gone straight over my head (T2E).

Another participant, when asked how their professional development could be improved, simply stated that they:

would like more clarity (T1C).

Conversely, in those schools where the overwhelming feeling was positive one common theme was evident. The clarity of vision and direction, which is supported by relevant training and suitable resources:

Our principal is passionate about [thinking within inquiry]. He works hard to make sure we understand why we are on board. It’s not a dictatorship thing that we have to do this because he said. He provides us with all the things we need to do what is asked (T3B).

When asked what PD would improve their ability to teach thinking within inquiry, participants in all five schools identified the three major themes outlined in Table 4.7.

<table>
<thead>
<tr>
<th>Major Theme</th>
<th>Keywords/Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modelling/Observation</td>
<td>• Observation of successful practice</td>
</tr>
<tr>
<td></td>
<td>• Video examples of thinking in action</td>
</tr>
<tr>
<td></td>
<td>• Access to suitable models of what is expected</td>
</tr>
<tr>
<td></td>
<td>• Observation of teachers at similar level</td>
</tr>
<tr>
<td>Feedback</td>
<td>• Visits and feedback from leaders on current practice and next steps</td>
</tr>
<tr>
<td></td>
<td>• Follow-up visits from experts to see application of new learning</td>
</tr>
<tr>
<td></td>
<td>• More clarity of what is expected</td>
</tr>
<tr>
<td>Reflecting/Sharing</td>
<td>• Time to get together and share what is working</td>
</tr>
<tr>
<td></td>
<td>• Opportunities to reflect after access to new learning</td>
</tr>
<tr>
<td></td>
<td>• Opportunities to share successes and frustrations with peers</td>
</tr>
</tbody>
</table>

Table 4.7: Areas identified for improved professional development

Although represented equally, the first theme of modelling and observation was overwhelmingly the most frequent response (78%) across all five of
the cluster schools. The following quote is indicative of the type of statement made with regard to this issue:

*There are schools that are doing a really good job in thinking. It would be really good to go and visit them and talk to their staff at a similar level and find out what they’re doing, how they do it and why it works so well for them. I think that would be really useful* (T1B).

Notably absent from this table was the request for more direct input. It would appear teachers wanted to consolidate what they had already learnt to date and to gain some clarity around the expectations held by school leaders. It is not surprising then to see the following comments regarding time for reflection and sharing being voiced.

*There’s no time to really discuss with another teacher why they’re doing what they’re doing. We just look at their walls and that’s about it* (T4F).

This statement illustrates the frustration of one teacher given the opportunity to visit a colleague without any time to meet and process what had been observed. This notion of observing other teachers raises the issue of expertise.

Table 4.8 outlines those who were identified as leaders in each of the schools in order of frequency. Principals were clearly most commonly identified (86%) as leaders followed by senior management (52%). Of note was the lack of acknowledgement of the lead teacher as a leader. Every school had a lead teacher in the area of developing thinking as a requirement of the ministry contract, yet only 8% of participants identified them as leaders. These responses were consistent across all five schools suggesting the leadership inherent in each of the five schools is somewhat similar in its distribution.
<table>
<thead>
<tr>
<th>Position of identified leaders</th>
<th>Frequency (n=79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal</td>
<td>68</td>
</tr>
<tr>
<td>Senior management (Deputy Principal, Curriculum Leader, Team Leader)</td>
<td>41</td>
</tr>
<tr>
<td>Outside facilitator</td>
<td>17</td>
</tr>
<tr>
<td>Lead teacher</td>
<td>6</td>
</tr>
<tr>
<td>Colleague</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 4.8: Identified leadership

When asked how knowledgeable participants felt their leaders of thinking were, responses suggested a significant majority (68%) felt confident that those in positions of responsibility had the ability to be there:

*I think our principal has done a huge amount of research and reading and talking and what have you. He always comes across as knowing what he’s talking about when he talks to us about thinking and it’s always backed by the fact that he’s been talking to some person ho is very knowledgeable (T3C).*

*Our principal is always sharing what he has read with us (T2C).*

One participant raised an interesting thought about possibly untapped leadership:

*I think there are people here who are very knowledgeable and they don’t even realise (T5C).*

Responses to the question of how the leadership could be improved were very much in line with those made in reference to improving the PD programme as outlined in Table 4.7. Little, if any, distinction was made between improving the leadership and improving the PD programme itself. Responses merely suggested that leaders implement those themes identified earlier. One possibility here is that participants consider PD a component of leadership and, in turn, treat the two concepts as one.

The final leadership component in this research study centred around goal setting, both personal and institutional. In the focus group interviews
participants were asked what goals existed in their schools with regard to teaching thinking for understanding within inquiry. One participant captured the general response to this question very well:

*There’s nothing explicit out there though is there? Is it written down somewhere? I’m just trying to think (T3A).*

Across all cluster schools participants struggled to identify with any confidence the goals they were working toward. The exception being school S4 where participants (73%) confidently suggested they were developing a thinking curriculum.

Although it was clear from the relative consistency of responses demonstrated throughout this chapter that there must have been some clear sense of where these schools were heading, it could not be clearly articulated by anyone except the principals’ focus group and, to some degree, school S4. Consequently, when asked which theories were guiding the current direction of their school, participants drew a blank. Not surprisingly when asked what involvement teachers had in developing goals for the school the overwhelming response (19 of 22 responses) was ‘none’.

With the apparent lack of awareness around their schools’ goals is was interesting to note that a small majority (54%) of participants stated that they had a formal personal professional development goal linked to the teaching of thinking for understanding within inquiry (Graph 4.12).
Interestingly, 80% of teachers in school S4 stated that they had a personal goal linked to thinking. As identified earlier this was the one school where a school wide goal was able to be clearly identified.

Finally, those participants that stated that they did indeed have a personal professional development goal linked to teaching thinking were asked to record it as accurately as possible. Table 4.9 summarises the keywords/statements present in the goals recorded by teachers.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Integrate thinking and inquiry</td>
<td>• Integrate thinking into all learning</td>
<td>• Integrate thinking into all learning</td>
<td>• Integrate thinking into all learning</td>
<td>• Integrate thinking into all learning</td>
</tr>
<tr>
<td>• Develop confidence in the use of ILP</td>
<td>• Implement SOLO taxonomy</td>
<td>• Develop student feedback in thinking</td>
<td>• Develop understanding of ILP</td>
<td>• Implement SOLO taxonomy</td>
</tr>
<tr>
<td>• Develop planning and assessment practices in ILP</td>
<td>• Develop planning and assessment for a thinking curriculum</td>
<td>• Develop understanding of ILP</td>
<td>• Observe other teachers introducing and teaching a thinking skills lesson</td>
<td></td>
</tr>
<tr>
<td>• Embed Inquiry into school culture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.9: Statements present in personal professional development goals

One consistent idea evident here is the desire to integrate thinking into all learning experiences. This is a positive sign as principals stated this as a
key goal for their schools during their focus group interview as evidenced by the following statements:

*It’s about the infusion of thinking into content instruction (P6C)*

*Thinking is absolutely necessary for inquiry and all learning is, or should be, inquiry (P6A)*

There is no evidence however to suggest that the alignment between the teacher goals and the institutional goals was explicitly planned on the part of school leaders. It would seem this came down to good luck rather than good planning.

**Conclusion**

This chapter has provided an analysis of data obtained through self-completion questionnaires and focus group interviews. Evident in this analysis is the overwhelming desire to infuse thinking into all areas of learning by both teachers and leaders. Considering the professional development opportunities provided for teachers in this area, their lack of confidence in their ability to define, connect and teach these thinking skills is an area for further discussion. Teachers identified two key areas that may support them in developing this confidence and ability. The first is around clarity of expectations in terms of what is expected from leaders and the second, although related, specifically deals with the modelling of successful practice. Data also suggest that the necessary conditions for the successful development of a thinking curriculum as identified by participants are well in place. What is therefore curious is the lack of ownership or input into developing goals directed at improving thinking for understanding within inquiry as an ideal. Discussion of these key points occurs in the following chapter.
Chapter 5
DISCUSSION OF FINDINGS

Introduction

The initial research questions explored why a focus on thinking for understanding was necessary in schools followed by an investigation into participants understanding of the associated terms concluding with a theory to practice gap analysis in this area. Having examined how aligned participant practice was with the theory around a thinking curriculum, the research focus moved on to identify what conditions were deemed necessary for thinking for understanding to become a natural part of all learning. The remaining research questions studied what leadership was necessary to bridge the theory to practice gap identified in this study. Specifically three key issues are explored in this chapter in relation to this apparent gap. The issues discussed are around establishing greater participant understanding and confidence, identifying and sharing successful practice in both teaching and leadership, and finally, broadening participant input into the development and success of institutional goals.

Teaching thinking for understanding

The initial focus of this research centred on why a focus on teaching thinking was necessary, how the terms thinking, inquiry and understanding were defined and connected and finally, what conditions should exist in
schools to make thinking for understanding a natural part of learning. Participant responses during focus group interviews and in written questionnaires suggested a reasonable alignment between current theory and practice regarding thinking as a necessity as well as an appropriateness of conditions for this thinking to take place.

In the first instance, participants identified a strong belief in the need to teach thinking. Reasons centred on the need to prepare children for an uncertain future, in which a wealth of information will be readily available to help them solve complex problems and make thoughtful decisions. Participants’ beliefs appeared to be in line with Fisher’s (2005) point that teachers “should focus on teaching skills essential to gaining, organising and using information. To be prepared for the challenge of the future, children will need skills that will give them control over their lives and their learning” (p. x).

Nearly 80% of participants believed children should be empowered to think critically about the information available to them whilst learning the skills to develop creative solutions. Participants repeatedly spoke about a changing future in which children will be required to think through some very difficult and complex problems, which will require them to have a thorough understanding of the issues if they are to tackle them. The data suggested participants saw thinking as a key to improving ones ability to develop these deep understandings. It was also noted by one participant that knowledge could no longer be considered constant. These ideas conform with Swartz et al's (2008) notion that skilful thinking enables one to “develop thoughtful products, such as decisions, arguments, and other analytical, creative, or critical products” (p. 1). They also align with Ennis’ (1987) revised idea of critical thinking. With knowledge being accepted as somewhat fluid, children must now think more critically about the information at hand and “make sound judgements regarding what to believe or do” (p. 45).
Necessary conditions to develop a thinking curriculum

With regard to the conditions identified as necessary for successful curriculum change, specifically in the area of teaching thinking, participants in this study suggested they felt very positive toward the current situation in their respective schools. That is, the culture of professional learning, as defined by Piggot-Irvine (2006) in Figure 2.2 in Chapter Two, was perceived as very positive within all of the cluster schools in this study. Of note was the high degree of trust commented on by just over 90% of participants. This trust, it appeared, allowed participants the opportunity to try new ideas, to experiment and be creative without fear of negative consequences should mistakes have occurred. Trust is essential in developing an environment where teachers and leaders can continue forward into the unknown feeling safe and supported. Beatty (cited in Lumby, Crow & Pashiardis, 2008) supports this assertion, stating that, “As all members of learning communities build trust, resilience and discerning responsiveness to the needs for change they also become better able to address both foreseeable and unforeseeable complexities together” (p. 154).

Of the 72 comments made by participants in relation to the need for high trust, 65 suggested regular open and honest reflection was an equally critical factor in developing a thinking curriculum. With new learning around pedagogy, time to share ideas, experiences and successes was seen as a very valuable, worthwhile and productive exercise by participants in this study. This is in keeping with Timperley et al’s (2007) findings that successful leaders “ensured organisational arrangements were put into place that provided teachers with the opportunities to learn, access to relevant expertise, and opportunities to meet to process new information” (p. xxxi).
Defining the terms of a thinking curriculum

With such positive alignment between theory and practice with regard to the need for teaching thinking, in addition to fostering a suitable environment to support this, it was somewhat curious to see such misalignment between what participants’ definitions of thinking were when compared with the literature or indeed each school.

The definitions of critical and creative thinking offered by Ennis (1987) and Sternberg (1998) included in Figure 2.1 in Chapter Two suggest these terms represent dispositions that are required by children to “become independent, self-directed and productive thinkers” (Swartz et al, 2008, p. 94). This notion of disposition refers to one’s ‘will’ (Tishman et al, 1995) or ‘character’ (Ritchhart, 2008). When asked what types of thinking should be taught in schools, the most common responses made by participants in this study were critical (79%) and creative (62%) thinking. These responses suggested that participants had not yet made a clear distinction between what constituted a ‘type’ of thinking that could be taught explicitly and in isolation, versus what had been identified in the literature as a way of thinking. Participants’ ideas in this instance contrasted Ritchhart’s (2008) belief that these critical and creative dispositions should be developed through “an abundance of rich thinking opportunities woven throughout the year that were carefully timed and supported. Through these opportunities, students learned thinking skills and were given a chance to practice them” (p. 148). That is, being skillful in various types of thinking supports and develops one’s ability to think critically as opposed to being a type of thinking in itself. Fisher (2005) asserts that “[children] need to be shown how to think critically” (p. 53). The ‘how’ in Fisher’s statement refers to the types of thinking.

The confusion demonstrated by participants’ responses in this study might have stemmed from an interest in the work of Ennis (1962) by some of the school leaders. In Ennis’ (1962) earlier work he defined the term ‘critical thinking’ in an effort to clarify this growing field of academic study
particularly within philosophy. Some leaders in the case study schools who were exploring the need to develop critical thinking held Ennis’ work in high esteem. Consequently, thinking was primarily referred to as critical thinking in the early stages of this initiative. Participants could therefore be excused for believing this was what they were expected to teach. Adding further to this confusion was the difficulty finding a curriculum related document that did not contain the term critical and/or creative thinking. Even the recently published New Zealand National Standards in Reading document (New Zealand Ministry of Education, 2009) state that children from years one to eight should think critically about the text they are reading. Highlighted here is the need for school leaders to ensure a clear understanding of current theory is achieved to ensure everyone is on the same page. This is in line with the findings of Robinson et al (2009) who assert that, “A prerequisite for engaging is the ability to inquire into the theory that underpins the practice that needs changing” (p. 44).

Perhaps a more fundamental reason for this misconception shown by participants in this research stemmed from a lack of understanding of the key terms themselves. If one cannot define the key terms in a thinking curriculum, how can one possibly understand how they are connected let alone feel confident teaching them? Participants were by and large unable to clearly define the term ‘critical thinking’ that was so commonly used. With slightly less than 80% of participants suggesting that we teach critical thinking, including school leaders, it was concerning that when asked to define this term during focus group interviews, only four definitions were offered, each different from the other, with not one being accurate or complete enough to call ‘correct’. With teachers and leaders being equally incapable of defining critical thinking, it was not surprising that they were unable to situate it appropriately in a theoretical framework.

In a similar vein to the lack of clear definitions and understandings discussed above, there were further misconceptions evident in the data. At least one participant from each cluster school put ‘inquiry’ and ‘SOLO’ forward as ‘types’ of thinking along with ‘decision making’. ‘Problem
solving’ was also put forward by more than half of all participants as a ‘type’ of thinking. These responses represented significant misconceptions when compared to the situating thinking framework presented in Figure 2.1 in Chapter Two. The notion put forward by participants in this study that decision making and problem solving are types of thinking contrasts with Swartz et al’s (2008) idea that these are instead thinking tasks that can be undertaken within an inquiry process.

In contrast to earlier misconceptions, when participants in this research were asked to describe the inquiry process as it existed in their schools, results were notably consistent. All schools identified a similar set of stages indicating a good understanding of the inquiry process as initially described by Dewey (1933). One would assume that a clear understanding of the inquiry process would prevent participants referring to it as thinking. Yet as highlighted by participant T4C when asked to describe the stages of their inquiry model their response was “our thinking model has five stages of inquiry”.

As mentioned already, another issue of confusion illustrated in the research results related to the use of SOLO, “Structure of Observed Learning Outcomes” (Biggs, 2003). In short, Biggs & Collis (1981) developed a taxonomy to assist educators evaluate the demands of learning outcomes and consequently construct better ones. Since this time some proponents of higher order thinking programmes have adopted this language to assist them in describing the thinking involved in learning tasks. As a component of the EHSAS professional development programme, the cluster schools in this research introduced SOLO with input from two external educators, to support the development of a thinking language. As highlighted in Table 4.5 in the previous chapter, participants believed that a shared language was a necessary condition for teaching thinking. An unfortunate outcome of this SOLO professional development, it seemed, was the mistaken belief that SOLO was in itself a type of thinking. This resulting confusion highlighted the need to mindful of how external expertise was selected and utilised. This conclusion is
consistent with the findings of Timperley et al (2007) who suggested experts were a common factor in the success of professional development programmes, however they need “more than knowledge of the content of changes in teaching practice that might make a difference to students; they also need to know how to make the content meaningful to teachers and manageable within the context of teaching practice” (p. xxix).

The final conclusion in relation to the theory and practice gap identified in this study was exposed in list C in Table 4.3. By and large this list reflected very closely the ‘types of thinking’ identified in literature and summarised in the curriculum section of Figure 2.1 from Chapter Two. One could say that list C represented the most accurate answer to the question concerning the types of thinking for instruction, however it summarised the most inconsistent responses across all the cluster schools. This suggested that collectively a small minority of participants were aware of the various types of thinking, however once again, consistent understanding by the majority of cluster school participants was lacking.

**Teaching thinking in practice**

A significant concern identified in the findings was that participants, particularly teachers, lacked confidence in their ability to teach the thinking they so strongly believed in and valued. With the focus of this study being around leading the development of a thinking curriculum, this issue was one that needed addressing. A more thorough exploration of current theory and practice in the field of thinking in education by the cluster school leadership before introducing it to teachers may have provided a clearer starting point for teachers and leaders alike. This assertion compares favourably with Timperley et al’s (2007) finding that, “All the studies with substantively improved student outcomes had a strong theoretical underpinning that was clearly communicated to teachers” (p. 79). Although leaders had done a good job of creating a safe and trusting
environment in which teachers were able experiment with new ideas, a great deal of confusion reigned which was ultimately counterproductive.

The findings of this study also highlighted a significant gap between how confident leaders were in their ability to define thinking as compared to teachers, with leaders being notably more confident. This finding indicated either a misplaced degree of confidence by one of the two groups or, a poor understanding of leaders’ expectations and goals by teachers. Data suggested it was the latter. When asked what professional development would further develop their ability to teach thinking, participants identified three major themes with these being, modelling/observation, feedback and reflecting/sharing. These themes all have a common goal of improving understanding suggesting participants were not yet suitably confident in their ability to define and consequently teach thinking.

In their work around effective instructional leadership Blasé and Blasé (1999) highlight the need for ongoing reflection and feedback by suggesting that, “effective principals valued dialogue that encouraged teachers to critically reflect on their learning and professional practice” (p. 133). It would seem, in the case of the cluster schools, new ideas were presented and then left in the hands of teachers to explore and trial. Missing from this process were consistently planned opportunities to reflect and share experiences and/or discuss feedback from principals or experts based on observations. Without this reflective feedback, teachers were not provided with the positive effects outlined by Blasé and Blasé (1999) being, “increased teacher reflection, innovation/creativity, instructional variety, risk taking, better planning for instruction, and improved teacher motivation, efficacy, sense of security, and self-esteem” (p. 134).

As explicitly teaching thinking is a somewhat new idea in modern schooling, it is likely to challenge the current values and beliefs on which teacher practice is based. Reflective dialogue would have allowed teachers and principals to acknowledge participants’ tacit knowledge whilst
introducing new knowledge as suggested by (Timperley et al. 2007). This process would have served two purposes. The first, being the opportunity to ensure clarity of expectations from school leaders was achieved, and secondly, it would have explored participants understanding and application of leaders’ expectations and provided feedback against these.

This section has highlighted numerous areas of misunderstanding, misalignment and misconception. Essential to the success of any new curriculum initiative is the development of a shared language with shared understandings. The data suggested that participants in this case study believed this to be the case. The general feeling indicated by participants was that an agreed set of thinking skills with shared names and meanings must be taught, reinforced and revisited so they became second nature to all students at all times. Participants’ views in this case were in line Timperley et al’s (2007) findings in which Little (2003) is cited discussing the failings inherent in a particular case study. “One limitation was teachers’ superficial, decontextualised descriptions of practice, expressed in language that lacked shared meanings. In these circumstances, it was difficult for teachers to assist one another to be more effective” (p. 204). There is a fine line between providing opportunities for teachers to experiment and trial new ideas and simply floundering. With a clear desire to establish greater understanding and clarity, it was understandable that nearly 80% of participants felt opportunities to observe best practice would have been helpful in clarifying what leaders expectations looked like in action.

**Necessary leadership to align theory with practice**

This section is divided into two parts for discussion. The first point examines the idea of identifying and sharing successful practice with regard to learning and teaching whilst the second discusses the identifying and sharing of successful leadership.
Identifying and sharing best practice in learning and teaching

The most common theme that emerged from the findings, in response to how the professional development of teaching thinking could have been improved, was the notion of identifying and sharing/observing best practice. This idea raises some substantial challenges for leaders. In the first instance, in order to identify best practice, a clear impression of what this consists of must be established. Simkins (2005) refers to this exercise as identifying knowledge of practice. “This refers to the knowledge that is derived scientifically from research and then applied to practice. In this sense, practitioners don’t create knowledge, but they use it….When this is known, standards of ‘best practice’ can be established…” (p. 20).

Having established the expectations or standards of best practice, internal expertise can be identified and shared. This notion sits very well with the principles of distributed leadership. That is, “viewing leadership as dispersed helps organisations to more effectively utilise all the talents within them, and in so doing not only facilitates the achievement of goals, but also the empowerment of individuals” (Bottery, 2004, p. 20). This idea of shared leadership supports the features of adult learning in that “it is focused on practical and relevant issues for the participants, incorporates their prior experience, is active, links theory and practice, and is participant led” (Piggot Irvine, 2006, p. 482). As it was the teachers who were the learners in this study, both these theories needed consideration. Data suggested that whilst the professional development focused on practical and relevant issues, it did little else to incorporate the needs of the teachers as adult learners. Further to this, data clearly demonstrated a hierarchical approach to leading the learning in the sense that participants in this study overwhelmingly identified their principals or senior management members as the leaders of this initiative in their schools.
Identifying and sharing best leadership practice

Although participants in this study identified modelling and observation as a means to further their understanding of teaching thinking, the same principles could easily have applied to school leaders. That is, where successful leadership was identified, it would have been useful to share this with colleagues to further develop the leadership capacity within the cluster.

Responses suggested that participants in this study were interpreting the role of leadership as a leader’s ability to implement a professional development programme. In this study it was evident that participants in schools S3 and S4 (Graph 4.11) felt significantly more positive toward their professional development experience than participants in the other schools. Of interest here was the fact that school S3 and S4 had established ongoing relationships with outside experts. One could conclude from this that the use of these experts was a determinant of success with regard to professional development. This conforms with Timperley et al’s (2007) suggestion that, “In effective communities, alternative perspectives introduced by external experts served to deepen teachers’ understandings. Not only were external experts able to introduce new perspectives, they were not constrained by existing dialogical norms” (p. 203).

In addition to the use of external experts, participants in all schools noted that those identified as leaders within their schools participated alongside them in their new learning. This was a very promising observation as Robinson et al. (2009) note that promoting and participating in teacher learning and development had the largest estimated effect size on student outcomes. “This means that this set of leadership practices has a large, very educationally significant effect on student outcomes” (p. 42).

This issue of the leader’s involvement in professional development raised the question of where leadership resided in the case study schools. As a
requirement of the EHSAS contract, schools were encouraged to identify and utilise lead teachers. Of the 79 participant responses in this study only 6 identified the lead teacher as a leader. This suggested that distributed leadership is not simply a case of giving someone a title and/or a role. It should be considered far more organic than this as illustrated by Woods et al. (2004) who assert that “distributed leadership highlights leadership as an emergent property of a group or network of interacting individuals” (p. 441).

Collaborative development of organisational goals

Evident in the conclusions thus far is the successful inclusion of relevant educational leadership as defined by (Bush, 2003; Bottery, 2004; Harris, 2005; Southworth, 2004) along with the development of a positive learning culture as promoted by Robinson et al. (2009) and a well promoted, supported and resourced professional leadership programme as outlined by (Piggot-Irvine, 2006; Timperley et al., 2007). Notably absent was the collaborative development of organisational goals as suggested by (Fullen, 1999, cited in Harris, 2005; Southworth, 2004, Timperley et al., 2007) within a common vision supporting student outcomes and school goals. This led to a professional development programme that was, in some participants’ opinions, disjointed and incoherent in its design. As one might expect it was participants in schools S1, S2 and S5 that data suggested were less positive about the impact of their professional development experience (Graph 4.11) that were the same making the negative comments. The consequence of this was that the implementation of a professional development programme for teachers that had everything going for it, with little shared knowledge of where it was going. This was well illustrated by participant T2D. “We’ve done heaps of really interesting and exciting stuff around thinking and I’m just not really sure where we’re going with it all though”.

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How can one know when one has arrived if one doesn’t indeed know where one is going? With the development of a thinking curriculum being the central aim for this cluster of schools, one would have expected to find numerous goals to this end. Only school S4 identified a common goal with any consistency. Even so, the goal identified was very broad and was more in line with the central aim stated above. The cluster schools provided a strategic plan with seven specific goals (Appendix C) with the heading ‘Developing a Thinking Curriculum’. During their focus group meeting, four of the five principals made mention of this document. During the teacher focus group interviews, not a single participant mentioned this document. Clearly school leaders had worked on this document extensively and had a clear understanding of where they were heading, however it would seem it was not communicated successfully to teachers.

Southworth (2004) identified framing school goals and communicating school goals as “being connected to teachers’ professional growth and performance” (p. 105). In the work of Robinson et al. (2009), “setting and communicating goals for teacher and student learning was one of the most obvious exercises of leadership” (p. 106). It appeared in this study that the cluster school leaders had fulfilled the first component of these findings around the establishment of goals. Needing development was the communication of these goals. Closely tied to this was the issue of clarity raised earlier in this chapter. The lack of clarity demonstrated by participants was of concern as Robinson et al. (2009) go on to suggest that regardless of “how often they are articulated by leadership, goals are not clear if they are not understood by those they are intended to influence. This is particularly important when those who set the goals are not those who have to achieve them” (p.108). That is, it is not enough for principals to develop seemingly important goals. They must also ensure teachers understand these goals and are aware of their importance.

This process of developing a shared understanding cannot take place in a vacuum. As discussed earlier, the established culture was seen as very safe and supportive. Professional dialogue was mentioned by a number of
participants as a worthwhile and productive exercise that was conducted regularly. This is in keeping with Southworth’s (2004) point that “professional dialogue and discussion are important because they develop shared knowledge, common meanings and deeper understandings” (p.105). This being said something still did not add up. Given that regular, open and honest conversations were held regarding teaching thinking, why did such a lack of awareness and understanding still prevail? Wilson and Berne (1999) in Timperley et al. (2007) offer a plausible reason. “In a review of professional development “…the goals for engagement in professional development experiences are typically not shared” (p. 15). This was a strong possibility in this study, as already mentioned, not a single participant made reference to the EHSAS strategic plan that contained the professional development goals established by the cluster school principals.

With the exception of school S4 (Graph 4.12), the mean percentage of participants with personal professional development goals linked to teaching thinking for understanding sat at just 50%. With school S4 sitting well above this mean at 80%, this perhaps offers yet another clue as to why 70% of participants from this school felt their professional development experience had had a great degree of impact on their ability to teach thinking for understanding. The underlying concern in relation to this lack of goals was one of teacher improvement. As data showed in Chapter Four, participants wanted more clarity around what leaders expected. The answer to this problem lies in the communication and monitoring of these goals. Timperley et al. (2007) suggest ‘self-regulation cannot happen in the absence of goals” (p. 15). Had participants been actively involved in the development and ongoing refinement of these EHSAS cluster goals, they would have been more aware of the expectations held by school leaders and in turn leaders would have been able to provide greater feedback against these shared outcomes.
Conclusion

This chapter has provided a discussion of the data in Chapter Four as it relates to current theory. The need to teach thinking and the establishment of a suitable environment for this to take place were two areas in which current practice reflected the theories espoused in current literature. Conversely three areas were identified in which a theory to practice gap existed. Participants’ responses highlighted a lack of understanding and confidence in relation to teaching thinking for understanding. Further to this there was a feeling more opportunities to share successful practice were necessary. Finally there was a clear gap between leaders and participants' knowledge of the organisational goals in relation to developing a thinking curriculum. Consequently Chapter Six provides recommendations for use by the cluster schools leadership, to further develop the current professional development programme for teaching thinking, employing best practice identified in current educational leadership research.
Chapter 6
CONCLUSIONS AND RECOMMENDATIONS

Introduction

This final chapter summarises the conclusions drawn from the research. These conclusions are divided into two parts and link directly to the research questions outlined in Chapter One. The first part of this chapter identifies and highlights the positive alignment between theory and practice with regard to participants’ belief in teaching thinking for understanding as well as the successful development of a cluster wide culture incorporating the conditions necessary for teacher professional learning. The second set of conclusions identify three areas where a theory to practice gap exists. A discussion regarding how these areas are connected is followed by an overview of the implications for leadership regarding the theory to practice gap identified. Consequently, recommendations are provided for the cluster school leaders to improve the professional development programme for teaching thinking for understanding within inquiry. Finally the limitations of this study are outlined along with ideas for future research in this area.

Successful alignment of theory to practice

The first research question in this study asked why a focus on thinking for understanding is necessary in schools. In both the data and the literature it was clear that the need for children to learn skills that will enable to them to gain, organise and utilise information to solve complex problems, make
thoughtful decisions and develop deep understandings were seen as essential. Central to this was the belief that children needed to become skilful thinkers (as supported by Swartz et al., 2008) who will be able to independently think critically and creatively when confronted with these challenges later in life. This is a view previously noted by Fisher (2005).

Question four set out to explore the conditions best suited to the development of thinking for understanding as a fundamental part of learning. A comparison of existing conditions as described by participants in the cluster schools, and the theory associated with professional development suggested that school leaders had done a good job of creating a positive and high trust culture of professional learning in which professional development was valued. This bodes well as Piggot-Irvine (2006) asserts that it is principals that have a significant impact on the climate of professional learning where collaboration and collegiality are the norm. Participants in this study also suggested that an appropriate culture to support the infusion of thinking was well established in the five cluster schools. That is, participants felt conditions in their schools relating to Ritchhart’s (2002) eight cultural forces, summarised again below in Figure 6.1, reflected their desire to infuse thinking into all areas of learning and teaching.

**Partial alignment of theory to practice**

Literature relating to research questions two and five provided a theoretical foundation to create ideals or models (Figures 2.1 and 2.2 in Chapter Two) to act as lenses through which practice could be viewed and compared with theory. In both these instances findings were mixed. Participant responses to questions two and five suggested in both cases there were areas of alignment and areas needing development.

In the first instance research question two asked how the terms thinking, understanding and inquiry within the school context are defined and
connected. An interpretation of the literature relating to this question is presented as the ‘Situating Thinking’ framework (Figure 2.1) in Chapter Two. This framework contains the terms used most frequently throughout the literature with respect to teaching thinking for understanding within inquiry. This framework acted as an ideal to compare theory with teacher practice thus providing answers to question three of this research. Figure 6.1 below contains a summary of the Situating Thinking framework from Chapter Two. The shaded areas in this figure illustrate areas where participants demonstrated sound understanding of the terms contained within them. The white areas indicate a distinct lack of alignment between the theoretical ideals and participant practice. These areas of misalignment are discussed later in this chapter.

As indicated by Figure 6.1 participants had a sound understanding and awareness of the cultural forces developed by Ritchhart (2002) necessary to infuse thinking into all areas of learning and teaching. When asked to
identify the conditions necessary in schools to make thinking for understanding a fundamental part of schooling, participants’ responses touched on each of the these cultural forces. Evidence that these cultural forces were well established was also present in findings contained in Table 4.5 in Chapter Four. That is, many of the participants made reference to the same terms used in the cultural forces. Figure 6.2 illustrates how both sets of responses connect the cultural forces with the development of the major themes identified in Table 4.5. It is interesting to note here that participants suggested a learning community required the consideration of all eight cultural forces.

<table>
<thead>
<tr>
<th>Conditions necessary in schools to make thinking a part of all learning</th>
<th>Cultural forces to support necessary conditions</th>
</tr>
</thead>
</table>
| Safe/Trustng | Attitudes  
| | Relationships  
| | Environment  
| | Expectations  
| | Language  
| | Opportunities  
| | Actions  
| | Successful professional development | Expectations  
| | Language  
| | Opportunities  
| | Actions  
| | Attitudes  
| | Relationships  
| | Successful leadership | Opportunities  
| | Environment  
| | Suitable resources | Expectations  
| | Routines  
| | Language  
| | Opportunities  
| | Shared understanding/Language | Expectations  
| | Routines  
| | Language  
| | Opportunities  
| | Learning Community/Culture of learning for all | Actions  
| | Attitudes  
| | Relationships  
| | Environment  
| |

*Figure 6.2: Connecting cultural forces with conditions for teaching thinking*

An area of partial alignment evident in the findings relating to question two was the appreciation by participants of ‘inquiry’ as a suitable pedagogy for teaching thinking. More specifically, participants’ understanding of inquiry, in the context of teaching thinking, centred on the ‘process’ of inquiry
rather than how it facilitated the teaching of thinking. That is, participants in all five schools identified similar steps in the inquiry process, yet confidence levels amongst participants to facilitate such a pedagogy were not as high as their belief in the need to teach this way. Comments made during focus group interviews suggested that this lack of confidence was, in part, due to a superficial understanding of inquiry as a pedagogy. Participants did not explicitly make the connection that the inquiry process served to assist learners to solve problems, make decisions or conceptualise new learning. This suggested participants were unaware of Swartz et al’s (2008) belief that the inquiry process is operationalised within three ‘thinking tasks’ being problem solving, decision making and conceptualising.

Having identified areas of alignment and partial alignment with regard to participants’ understanding of the theory relating to teaching thinking for understanding within inquiry as well as their ability to put this into practice, attention turns next to how this alignment came about. It was evident in this study that a programme of professional development had been undertaken. Question five examined how the leadership of the professional development programme in the cluster schools aligned with current leadership theory. As stated earlier, Figure 2.2 in Chapter Two provided a theoretically informed lens through which to examine the leadership of professional development for teachers in the participating cluster schools. Figure 6.2 below indicates the areas where the leadership of professional development found in this study aligned with theory along with a number of areas for development.
### Areas of alignment with theory

<table>
<thead>
<tr>
<th>Educational Leadership</th>
<th>Areas for development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional/Transformative/Distributive</td>
<td>Organisational Goals</td>
</tr>
<tr>
<td>Culture of Professional Learning</td>
<td>Collaborative development of:</td>
</tr>
<tr>
<td>Leaders participate in professional learning in an environment of collaboration and collegiality</td>
<td>• Vision</td>
</tr>
<tr>
<td></td>
<td>• PL goals</td>
</tr>
<tr>
<td></td>
<td>• Student achievement targets</td>
</tr>
<tr>
<td></td>
<td>• School goals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional Learning Programme</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaders ensure organisational arrangements are made to provide teachers with:</td>
<td>• Opportunities to observe best practice</td>
</tr>
<tr>
<td>• Opportunities to learn new ideas</td>
<td>• Opportunities to meet and process new information</td>
</tr>
<tr>
<td>• Access to relevant expertise</td>
<td>• Teacher feedback</td>
</tr>
</tbody>
</table>

*Figure 6.3: Theory to practice gap in leading professional development for teachers*

The first area of alignment in this study is in the area of educational leadership. Evidence in this study suggested leaders had; developed a clear vision for change linked directly to student outcomes (instructional); built strong relationships with and amongst teachers and themselves (transformative); and provided some opportunities for expertise to emerge from within their schools (distributive). These statements regarding each model of leadership reflect the definitions offered by Bush (2003) in his article on educational leadership and management.

Following this, the next area of alignment in the professional development programme was the establishment of a positive culture of professional learning. All of the cluster school leaders were actively involved in professional learning and participated alongside teachers in professional development opportunities. This finding compares favourably with the research findings of Robinson et al. (2009) in which they identify the notion that leader participation in school wide professional development has been
shown to have the greatest impact on outcomes for students, twice that in fact of any other act of leadership.

The final area of partial alignment with regard to the professional development programme relates specifically to the professional learning programme within the cluster schools. Findings suggest participants in this study were provided opportunities to learn new ideas along with access to relevant experts. Professional learning for teachers, involving external expertise in a collaborative environment has been shown by Saxe, Gearhart and Nasir (2001) to provide greater benefits than just collegial support. In their study of teaching conceptual understanding of fractions, students made the greatest gains when teachers were provided access to suitable resources along with external expertise to challenge their beliefs and provide conceptual and practical advice.

**Identifying the theory to practice gap**

So far in this chapter areas of successful theory to practice have been discussed in relation to participants understanding of a thinking curriculum along with the leadership of the professional development programme that has gotten them to this point. The following section highlights significant theory to practice gaps evident in the findings.

The previous section identified participants’ knowledge of the Situating Thinking framework, as summarised in Figure 6.1, specifically in relation to their awareness of the cultural forces and their understanding of ‘inquiry’ as a process. In contrast to these areas of positive alignment between theory and practice, findings suggest that participants had a distinct lack of knowledge and understanding of the terms relating specifically to thinking dispositions and core types of thinking. In addition to this, their awareness of how the inquiry process specifically supports the teaching of thinking was limited.
Perhaps the most perplexing finding with regard to participants understanding of the Situating Thinking framework was in relation to their responses regarding critical and creative thinking. Critical and creative thinking are not types of thinking to be taught, rather they are enculturated in an environment where various types of thinking are regularly taught and enacted. This is consistent with views held by Fisher (2005), Ritchhart (2002), and Swartz et al. (2008). In this study 79% of participants stated that critical thinking, and 62% stated creative thinking, were types of thinking that should be explicitly taught. An impossible task if we accept the view held by Fisher (2005) that these are in fact dispositions. Of greater concern was the complete inability by anyone to clearly define the one term that is used most widely by all participants. That is, not one participant could clearly, confidently or, most importantly, accurately define critical thinking. With one in five participants suggesting critical thinking be taught, this is a significant issue.

Similarly, findings suggested participants had very limited knowledge of the types of thinking that should be taught as a thinking curriculum. Collectively, participants identified only eight of the fourteen ‘core/fundamental types of thinking’ listed in the summary of the Situating Thinking framework (Figure 6.1). No one school or individual in this study was able to identify the majority of these types of thinking. Again, a most alarming finding as these ‘types’ of thinking form the curriculum component of this framework. That is, the ‘types of thinking’ listed in figure 6.1 are the components that should be taught explicitly. This position is strongly supported by Swartz et al. (2008) in which they propose that learners need to become proficient in each type of thinking so that they may ultimately self select the appropriate type of thinking to address the purpose at hand.

The final area of misalignment with regard to participants’ understanding of the Situating Thinking framework relates to their locating of ‘inquiry’. Although, as outlined earlier, participants were aware of the process of
inquiry, findings suggested that they did not have a deep understanding of the inquiry learning process as a vehicle for developing thinking with one in four participants listing inquiry as a type of thinking. As shown thus far participants in this study had great difficulty identifying and defining the majority of the terms contained within Figure 6.1 and understandably even greater difficulty situating them in any logical manner. This lack of understanding and confidence on the part of the teachers indicated that it there were most certainly gaps in the leadership of the professional development programme.

As noted earlier the fifth research question sought to examine the leadership of the professional development programme for teachers in the cluster schools. Participants in this study noted that opportunities to reflect and share ideas were productive and worthwhile however a more coordinated and planned approach to this process was an area identified by them as needing further development. In addition to this, findings also suggested that external expertise was regularly available however participants identified a need to explicitly connect new learning to their current knowledge and practice. This need to coordinate and plan opportunities for reflection to make sense of new learning is consistent with Piggot-Irvine’s (2009) model of ‘Action Research’ in which participants are required to reflect to inform future learning. In Timperley et al’s (2007) model of ‘Teacher inquiry’ this opportunity for reflection is represented by a question in the teacher knowledge-building cycle. This cycle suggests that once teachers have trialled new practices, they consider what the impact of their changed actions has been.

Findings also indicated that participants felt opportunities to observe successful practice and to receive regular feedback from school leaders would be helpful in developing their understanding of, and consequently, their ability to teach thinking for understanding. The notion of observing successful practice and gaining feedback aligns well with one of the key principles of successful professional development discussed by King and
Newmann (2001) in which they suggest that “Teacher learning is most likely to occur if teachers have sustained opportunities to study, to experiment with and to receive helpful feedback on specific innovations” (p. 86).

Although not suggested as an area for improvement by participants, notably lacking in the findings was any real awareness or knowledge of the organisational goals associated with the cluster schools initiative to develop a thinking curriculum. With such a significant pedagogical and cultural shift being sought in the cluster schools, this lack of awareness of goals is of significant concern. Robinson et al. (2009) identify goal setting and communicating goals as the second-equal greatest leadership dimension affecting student outcomes. Ironic considering the most important act of leadership identified in the same study is well entrenched in the cluster schools, that is, principal participation in professional development.

Participant misunderstanding and lack of confidence may have been a consequence of the process by which the organisational goals in the cluster schools were developed. Robinson et al. (2009) suggest, “there is evidence that the content of goals may be as important as the process of goal setting” (p. 41). It was clear in both the written responses and the feedback from focus group interviews that the EHSAS goals were very much the product of work done by the cluster school principals. Beyond this group, very few participants were able to articulate what the cluster goals were for developing a thinking curriculum. The EHSAS cluster (W3BS) strategic overview (Appendix D) clearly shows seven goals along with some indication of timing regarding their likely completion. One would assume that even if participants did not know the contents of this document they might have at least made reference to it. Knowing that it existed and that they could refer to it would, at the very least, have shown an awareness that some goals existed. This was not the case.
Implications of the identified theory to practice gap

The initial concern in this study was the participants' lack of ability to identify, define and situate the most significant terms associated with teaching thinking for understanding within inquiry used throughout this research. It is essential that those delivering a curriculum of any sort be able to articulate what it is exactly they are teaching and consequently what it is their children or students are expected to understand as an outcome of this teaching. An apparent consequence of participants' limited understanding of the thinking curriculum was a lack of confidence in their ability to teach thinking for understanding. This notion is supported by Saxe et al. (2001) in which they developed a successful professional support programme guided by findings from prior research on classroom practice and student learning. Two of the components of their professional development programme aim to (a) develop teachers’ understanding of the mathematics they teach and (b) develop teachers’ understanding of children’s mathematics. Clearly evident here is the need to develop teacher understanding of the curriculum they are charged with delivering.

This significant lack of teacher understanding suggested the professional development programme evident in the cluster schools had not achieved all of its intended goals. As highlighted in the previous section participants in this study suggested three factors that they believed would have improved the impact of professional development on their ability to teach thinking. The first factor identified was the belief that more structured opportunities to reflect and share their experiences were necessary. This was followed by an identified need for feedback from either school leaders or external experts. Participants revealed that experts had provided varying degrees of input and support however they felt more work was needed to connect new theories to their own existing theories. The final consideration was the need for opportunities to observe best practice.
It is not unreasonable to see these three components mentioned collectively as they are very much interdependent and reflect very closely the action research model described by Piggot-Irvine (2009). That is, a teacher looking to further develop his or her practice might observe someone who is deemed to be a successful practitioner or capable of modelling best practice. Having done so, an opportunity to reflect on these observations with the teacher concerned would provide possible next steps. Once employed, these next steps form a set of criteria for either the school leader or indeed the successful teacher to provide feedback against regarding how well these changes have been implemented. This in turn would provide new next steps creating an endless cycle of self-development. The action learning model described by Piggot-Irvine (2009) arranges these components into three cycles; Examination of the existing situation, Implementation of change and, Evaluation of implementation of change. Having noted the apparent similarities between participants’ suggestions for improving the professional development programme and the action learning process, it would be useful for school leaders to consider this approach further.

Having noted that teachers must develop their understanding of a thinking curriculum through a process somewhat similar to an action research process, the notion of purpose comes to the fore. Without shared goals it is difficult to see how any organisation can move forward collectively to achieve a common outcome. The simple fact that the majority of teachers in this study could not articulate any goals relating to the development of a thinking curriculum suggests shared goals were not in place. Without a clear sense of direction afforded by shared goals it is understandable that participants did not yet have an understanding of a thinking curriculum. In the absence of shared goals there is no end point to work toward, no central thread to connect new learning to and certainly no opportunity to consider how closely current practice compares with the desired outcomes. This is a view shared by Timperley et al. (2007) who suggest that “it is the discrepancy between the goals to which teachers aspire and
the evidence about what is actually occurring that creates the motivation to learn and provides information about what needs to be monitored” (p.14). A case in point here is school S4 in which 80% of participants had a personal professional development goal linked directly to thinking for understanding. Consequently all participants from this school felt their professional development experience had a positive impact on their ability to teach thinking for understanding within inquiry, with 70% of these suggesting it had helped them to a great degree.

When asked what theories underpinned the development of goals regarding the development of thinking for understanding within inquiry, only the school leaders in this study were able to offer any reasonable response. Even then, the theories offered were somewhat superficial and tended to revolve around the motivation for teaching thinking, rather than what thinking consisted of in a curriculum context. This distinct lack of a sound theory base would explain why leaders had not provided teachers with a clear indication of what was expected. It is the knowledge of theory that creates dissonance between what is and what should or could be. This belief is consistent with the findings of (Fenwick, 2004; Robinson et al., 2009; Saxe et al., 2001; Timperley et al., 2007).

In addition to this need for theory based practice, if a shared language is to be established, as identified by participants as a necessary condition for teaching thinking, a clear understanding of relevant theory along with associated terms and definitions must be a prerequisite. This is consistent with Ritchhart’s (2001) suggestion that a commonly understood and shared language is one of the strongest cultural forces in an organisation. It is therefore evident from this research that the success of any professional development programme relies on the establishment of goals that are shared and valued by all stakeholders that are grounded in research and have a commonly understood language.
The final research question asked what leadership is necessary for a professional development programme for teachers in thinking for understanding within inquiry. The theory to practice gap identified above centres around two fundamental issues. The first issue noted that the majority of participants were unable to identify, define or situate the terms associated with the development of a thinking curriculum at the core of the professional development programme being researched. Secondly participants had very limited knowledge of the intended outcomes or goals guiding the professional development in place to improve this understanding. The conclusions outlined above provide some indication as to what needs attention to close this theory to practice gap. Research identified a minimal understanding or awareness of a relevant theory base with regard to teaching thinking within inquiry. Subsequently the language of thinking across the cluster and within each school was inconsistent. Further to this, it was found that participants were unaware of the goals that leaders had devised to support the development of a thinking curriculum. As a result teachers lacked clarity around what was expected and consequently confidence in their ability to teach such a curriculum was limited.

In order to develop a professional development programme, leaders and teachers must have an understanding of the theories that suggest change is necessary. In the case of this study it stands to reason that theories identified by school leaders were different to teachers’ current theories of action; otherwise there would have been no need for a professional development programme. This is consistent with Robinson et al. (2009) who suggest it is the comparison of theories that form the focal point for discourse during the development process. It is this discussion and debate that will ultimately develop the mutual understandings and language, identified earlier in this study by participants, as essential in establishing a new curriculum. As the schools in this case study had the intention of developing a shared thinking curriculum, the associated theories should have been well understood and shared by leaders prior to devising and
developing the cluster goals. This is significant component of action research often referred to as reconnaissance or, as described by Piggot-Irvine (2009), examination of the existing situation in which the researcher conducts a literature (theory) review around the identified issue to determine an ideal.

Having established an informed theory base, a need for teachers’ to explore their theories of practice with regard to what is being developed arises. That is, teachers’ must seek to understand what values and beliefs are guiding their current practice. In doing this teachers’ beliefs are made tangible making it possible for leaders and teachers to identify the challenges involved in changing their practice. A notion discussed by Argyris (1977) in his seminal work regarding double loop learning. This idea of exploring the driving forces behind one’s practice is well supported by the findings of a study conducted by Fenwick (2004) in which this process of theory examination was used to develop teacher professional growth plans. Common benefits identified by participants in her study were greater authenticity and commitment to their professional development, increased focus, increased collegiality and teacher self-affirmation. These benefits align very closely with the consequences of goal setting outlined by Robinson et al. (2009).

With the establishment of organisational goals a set of criteria to identify best practice can be developed. By identifying best practice within the cluster schools, other participants can observe this and reflect on how their theories and practice compare to this ideal. Feedback can be given regarding teachers’ performance in relation to these criteria. Again this notion aligns closely with the action research model identified earlier in this section. This idea is in keeping with what is described by Piggot-Irvine (2009) as evidence or data-based decision making in which decisions in action research are guided by data and evidence supported by reflection. Having reflected on changes made to teachers’ practice, the opportunity to
evaluate the effectiveness of what has been implemented avails itself (the final phase of the action research model).

**Recommendations**

The recommendations below have been derived from those areas where a theory to practice gap has been identified in relation to leading the development of teaching thinking for understanding within inquiry discussed above. The issues arising from this study needing to be addressed are as follows:

1. That school leaders research and develop a sound theory base for the development of a thinking curriculum. This will provide a clear starting point for the development of a shared vision. From this, leaders and teachers can develop universally understood organisational goals collaboratively to achieve this vision.

2. That the teacher professional learning programme be developed to ensure teachers and leaders have a thorough understanding of this theory base. As identified in this study teachers and leaders alike had very limited knowledge of the theory regarding teaching thinking for understanding leaving teachers feeling unsure of their ability to teach such a curriculum.

3. That the professional learning programme provides participants with access to external expertise followed by planned opportunities to reflect on new learning and make connections with current practice. The use of external expertise ensures that the status quo is challenged by ideas outside the current norm. As this is likely to cause some degree of dissonance, leaders must ensure time is allocated to explore any differences to identify how ones practice may be modified by this new information if at all.
4. That school leaders or indeed experts (external or internal) provide regular feedback to teachers regarding their practice as it compares to organisational goals and theory. This process affords two outcomes. In the first instance teachers are able to identify and develop next steps to further improve their practice. In addition to this, school leaders are able to identify examples of ‘best practice’ that provide models for future observation. This notion of internal expertise aligns with the theories of distributive leadership in which it is suggested that the person most capable of leading may not in fact be the school leader.

5. That teacher’s are provided opportunities to observe models of best practice followed by planned opportunities to reflect and share ideas. Much like the access to external expertise, these observations are likely to challenge teachers’ current theories and practice hence the need to discuss these observations with the person being observed.

The following flow chart provides a model showing the recommendations discussed above in action. The intention of this model is to compartmentalise the stages of teacher development into phases. These phases are necessary to ensure each stage of development is informed by clear expectations and understandings. That is, external support cannot be implemented without a clear understanding of what the overall vision and subsequent goals are for the organisation. Likewise, best practice cannot be identified without a clear understanding of what the theory looks like in practice.
Having indicated that the professional development programme necessary to improve teachers ability to teach thinking for understanding within inquiry requires modelling/observations, feedback from experts and school leaders along with more structured opportunities to reflect and share, Figure 6.4 demonstrates how addressing these concerns might also deal with the issues of participant misunderstanding and lack of confidence whilst improving involvement in developing and awareness of organisational goals. Having made reference to the action research model
throughout this chapter it is no coincidence that this model closely resembles the “Problem Resolving Action Research (PRAR) Model” adapted from the Cardno/Piggot-Irvine Model (1994) by Piggot-Irvine (2009, p. 14). Although similar to one another, two significant differences are apparent.

This three-phase model puts a great deal more emphasis on developing goal clarity and shared understanding and awareness of these goals. This reflects a need identified in a number of studies (Robinson et al., 2009; Saxe et al., 2001; Timperley et al., 2007) as well as the findings of this study. This model also focuses specifically on providing opportunities to observe ‘best practice’. This was a common suggestion made by participants throughout this study for improving the professional development programme. As teachers they wanted to see examples of what principals were talking about. This notion of observation for learning and reflection is one that is discussed at length by King and Newmann (2001).

**Limitations of this study**

The first and most significant limitation of this study was the dyadic nature of the research questions. As the aim of this research was to identify the leadership necessary to develop thinking for understanding within inquiry it was necessary to first define thinking in a modern schooling context. This provided an ideal to measure the degree of alignment between participant understanding and theory. The findings of this theory to practice gap provided the basis for the evaluation of leadership to date with strong alignment indicating successful leadership, and poor alignment indicating unsuccessful leadership. The consequence of the dyadic nature of this research was a division of time between curriculum research and leadership research. Although a limitation, a positive outcome of this split focus was a much deeper personal understanding of thinking for
understanding within inquiry, which as a leader of one of the cluster schools was extremely beneficial. This raises another limitation.

As a leader of one of the schools involved in the study, a significant challenge was ensuring data was as free of bias as possible. In the first instance, participants in my school were fully informed about the research and were subsequently offered the option to not be involved in this study at any level. All participants in my school chose to remain involved. Further to this, written questionnaires were issued and collected by the deputy principal in my absence and then posted directly to my home address. Secondly, it would not have been reasonable to conduct the focus group interview in my own school, as anonymity would have been compromised. Without this anonymity it would be difficult to ascertain the degree of honesty of responses. In an effort to address this, a peer from outside the cluster schools conducted the focus group interview within my school. The consequence of this was a lack of connection on the part of the researcher with the transcript from this interview. As an active participant in the other focus group interviews, the transcripts held more meaning due to an understanding of the context in which responses were made.

A further limitation of this study was the limited time spent exploring participants understanding of what constituted a thinking curriculum. It became evident early on that a thinking curriculum brings in a wide and complex range of terms each with their own definitions and place within a whole. As the focus of this study was on leading the development of teaching thinking for understanding within inquiry I explored the most significant terms relating to thinking as a curriculum, as identified in the literature review, allowing more time to query participants impressions of their professional development experience. Had I tried to examine participants’ understanding of all the terms associated with a thinking curriculum I would have needed much more time with each focus group. This would have been impractical as teachers and principals are very busy
people who have little time to spare. Not only that but the time necessary to transcribe each interview would have been excessive.

Further research

This research concentrated on leading the development of thinking for understanding within inquiry. Although the notion of inquiry has been around for nearly a century now, explicitly teaching thinking for understanding is still somewhat new and undefined in the modern schooling context. Further research could investigate the leadership of professional development in a more familiar context. This would allow a more concentrated focus on how teacher practice is developed where teacher knowledge is not such a significant barrier.

Although not specifically suggested by participants in this study, the notion of identifying best practice and consequently sharing this to develop others, is one that could apply equally to school leaders. Data from this study provided evidence of schools in which participants felt significantly more favourable toward the impact of their professional development experience on their ability to teach thinking for understanding. A worthwhile undertaking would be to identify the factors that impacted on these participants feeling more positive and share them.

This study identified a significant lack of theory awareness by participants. Further research into participants’ knowledge of the theory base informing professional development programmes they are involved in, in a variety of settings and contexts, would help to identify the relative importance of theory of practice on the likely success of their professional learning opportunities.

With such a complete lack of awareness or ownership of the professional development goals by participants in this study, further research into the
impact of goal development and awareness on the success of professional development programmes would be valuable.

Finally as highlighted above, the final recommendations of this study resembled very much a model of action research. As such, a trial of action research as a theoretically grounded professional development model for this cluster could be implemented and evaluated. A comparison of the findings of this study with the findings of a trial would provide useful insights for school leaders in developing a professional development programme in any curriculum area not to mention thinking for understanding within inquiry.

Conclusion

The intent of this study was to identify appropriate leadership practices that would facilitate the development of teachers’ ability to teach thinking for understanding within inquiry. Initial findings suggested school leaders had done a good job of creating a positive high trust culture of professional learning in which participants felt favourable toward the general direction of the professional development programme. The remaining findings suggested an appropriate culture with commonly held beliefs was not enough to develop teacher practice. With nearly half of the participants in this study stating they did not feel confident in their ability to teach thinking for understanding within inquiry there were clearly gaps in the professional development programme.

In the first instance this study found that the majority of participants could not identify, define or situate the terms inherent in a thinking curriculum. Of those participants that did offer suggestions, a great degree of misunderstanding and confusion as to what should be taught and how prevailed. Reasons for this confusion appeared to be linked to a lack of
knowledge of theory along with a lack of awareness regarding organisational goals guiding the professional development programme.

Further to this, participants suggested opportunities to observe best practice, critically reflect on changes to practice and receive feedback on current practice were critical to their ability to understand the expectations of school leaders regarding the implementation of this new curriculum. One participant from school S3 captures the essence of this notion nicely:

*I would like a theoretical session followed by an observation of a lesson ending with an evaluation and discussion (T3C)*

In conclusion, this study has found that leaders must, when designing professional development programmes, ensure teachers are aware of the importance of the organisational goals, are clear about what they mean and the theory that underpins them. In ensuring this is the case participants are more likely to have a more genuine commitment to these goals (as suggested Robinson et al., 2009) providing greater opportunity for them to self-regulate against them (as encouraged by Timperley et al., 2007). A theoretical informed understanding of the goals can form the basis for ongoing reflective conversations with peers, leaders and/or experts to help evaluate the effectiveness of changes made to date as well as identifying examples of best practice for the purpose of observation. As stated by Saxe et al. (2001) being aware of the discrepancy between what is currently happening and what is being strived for provides motivation and information on what needs further development. It is in the organisational goals that one finds what is being strived for. Without goals, there can be no discrepancy.
Bibliography


Dear Participant

The first stage of this research is to define and identify the relationship between the terms thinking and understanding, and to examine pedagogies and leadership that support the implementation of these. The next stage will compare this identified theory or 'ideal' with current teacher/leader understandings and practice in order to determine if there is a gap between the theory and practice in our schools. The final stage is the drawing up of recommendations that can be used to establish a professional development programme (and its leadership) for teaching thinking for understanding within inquiry.

Please take your time to read each question carefully and answer as honestly as possible. A simple tick placed on the most appropriate line is all that is required in most cases. Where a written response is requested, please keep responses short and to the point and ensure writing is clear and legible. All responses are entirely anonymous and will be treated in the strictest confidence. DO NOT RECORD YOUR NAME ON THIS QUESTIONNAIRE.

Thank you once again for your participation

1. Where do you currently work?  
   Beach Haven Primary  ___  1  
   Birkdale Intermediate  ___  2  
   Birkdale Primary  ___  3  
   St Marys  ___  4  
   Wainui  ___  5

2. Which group best describes you (please tick one only)?  
   Teacher years 1-3  ___  1  
   Teacher years 4-6  ___  2  
   Teacher years 7/8  ___  3  
   Non-teaching management  ___  4  
   Principal  ___  5

   *If you have answered this question as non-teaching management or principal, please do not answer the following underlined questions
3. A focus on teaching thinking is necessary in today’s schools.
   Totally agree ___ 1
   Agree ___ 2
   Neutral ___ 3
   Disagree ___ 4
   Totally disagree ___ 5

4. Please give your reasoning for your previous answer.
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

5. Please list what thinking (if any) you believe children should be taught in schools to
devote deep understandings?
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

6. How confident are you in your ability to clearly define/describe the kinds of thinking you
listed above?
   Very confident ___ 1
   Confident ___ 2
   Neutral ___ 3
   Unconfident ___ 4
   Very unconfident ___ 5

7. How confident are you in your ability to teach the kinds of thinking you listed above?
   Very confident ___ 1
   Confident ___ 2
   Neutral ___ 3
   Unconfident ___ 4
   Very unconfident ___ 5

8. How well do you believe you actually teach the kinds of thinking you listed above?
   Very well ___ 1
   Well ___ 2
   Neutral ___ 3
   Poorly ___ 4
   Very poorly ___ 5
9. What conditions do you believe must exist in schools to make thinking for understanding a natural part of learning?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

10. To what degree do you believe these conditions already exist in your school?
Great degree ___ 1
Some degree ___ 2
Very little ___ 3
Not at all ___ 4

11. Please outline what you believe the main stages/components of inquiry learning are in a typical sequence.
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

12. How well do you believe the inquiry learning model facilitates the teaching of thinking?
Extremely well ___ 1
Very well ___ 2
Neutral ___ 3
Very poorly ___ 4
Extremely poorly ___ 5

13. How confident are you in your ability to teach inquiry learning?
Very confident ___ 1
Confident ___ 2
Neutral ___ 3
Unconfident ___ 4
Very unconfident ___ 5

14. How well do you believe you actually teach inquiry learning?
Very well ___ 1
Well ___ 2
Neutral ___ 3
Poorly ___ 4
Very poorly ___ 5
15. Please outline briefly the professional development you have participated in over the last five years with regard to teaching thinking, thinking for understanding and inquiry learning?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

16. To what degree do you believe this professional development has helped you improve your ability to teach thinking for understanding within inquiry?

<table>
<thead>
<tr>
<th>Great degree</th>
<th>Some degree</th>
<th>Very little</th>
<th>Not at all</th>
</tr>
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<tbody>
<tr>
<td>___</td>
<td>___</td>
<td>___</td>
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</tbody>
</table>

17. What sort of professional development do you believe would improve your ability to teaching for understanding within inquiry?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

18. Who (please state their position) in your school has played a leadership role in your professional development in the area of teaching thinking within inquiry?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

19. What aspects of this leadership role were particularly helpful to you in your development?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

20. Do you currently have a formal professional development goal linked to the teaching of thinking for understanding within inquiry?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
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<tbody>
<tr>
<td>___</td>
<td>___</td>
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</table>

*If you have answered No to this question, please follow the instructions below.*
21. If you answered **Yes** to question 20, please write your current professional development goal as accurately as possible?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
APPENDIX B

Leading the Development of Thinking for Understanding within Inquiry

FOCUS GROUP SCHEDULE - TEACHERS

1. Location:
   - Beach Haven Primary
   - Birkdale Intermediate
   - Birkdale Primary
   - St Marys
   - Wainui

2. Why do you believe the cluster schools have a focus on teaching thinking?

3. Describe what thinking you believe children should be taught in schools to develop deep understandings.

4. Define the thinking terms you have described.

5. How well do you currently teach the kinds of thinking you have described?

6. What conditions do you believe must exist in schools to make thinking for understanding a natural part of learning?

7. Describe how these conditions already exist in your school.

8. Describe the inquiry learning process as it exists in your school.

9. Describe how your school’s inquiry learning model facilitates the teaching of thinking.

10. Describe what thinking you currently teach to develop deep understandings.

11. Describe any areas where you believe misconceptions or confusion exists with regard to you or your colleagues understanding of teaching thinking?
12. Describe the professional development you have participated in over the last five years with regard to teaching thinking, thinking for understanding and inquiry learning?

13. Describe how you believe this professional development has helped you improve your ability to teach thinking for understanding within inquiry.

14. How do believe the professional development of teaching thinking for understanding within inquiry could be improved?

15. Describe how well you believe this professional development programme has been lead.

16. How could this leadership be improved?

17. Describe how knowledgeable you believe the leaders of thinking are within your schools.

18. What goals exist within your school that supports the development of teaching thinking for understanding within inquiry?

19. Describe the theories that you believe have contributed to developing these goals.

20. Describe your personal involvement in developing these goals?
APPENDIX C

Leading the Development of Thinking for Understanding within Inquiry

FOCUS GROUP SCHEDULE - PRINCIPALS

1. Why do you believe the cluster schools have a focus on teaching thinking?

2. Describe what thinking you believe children should be taught in schools to develop deep understandings?

3. Define the thinking terms you have described.

4. How well are these kinds of thinking currently being taught in your school?

5. What conditions do you believe must exist in schools to make thinking for understanding a natural part of learning?

6. Describe how these conditions already exist in your school.

7. Describe the inquiry learning process as it exists in your school.

8. Describe how your school’s inquiry learning model facilitates the teaching of thinking.

9. Describe what thinking is currently taught in your school to develop deep understandings.

10. Describe any areas where you believe misconceptions or confusion exists with regard to you or your colleagues’ understanding of teaching thinking?

11. Describe the professional development you have participated in over the last five years with regard to teaching thinking, thinking for understanding and inquiry learning?

12. Describe how you believe this professional development has helped you improve your ability to lead teaching thinking for understanding within inquiry.
13. Describe how well you believe you have lead this professional development programme.

14. How could this leadership be improved?

15. How do you believe the professional development of teaching thinking for understanding within inquiry could be improved?

16. Describe how knowledgeable you believe you are as leaders of thinking within your schools.

17. What goals exist within your school that support the development of teaching thinking for understanding within inquiry?

18. Describe the theories that you believe have contributed to developing these goals.

19. Describe your personal involvement in developing these goals?

20. Describe the involvement of your teachers in developing these goals?