Improving the Reading Comprehension of Struggling Year Nine and Ten Readers

A thesis presented in partial fulfilment of the requirements for the degree of

Master of Education

At Massey University,

Palmerston North, New Zealand

Hillary Knowles

2012

Abstract

The objective of this project was to investigate to what extent metacognitive reading comprehension strategy training would influence the reading comprehension growth of a group of struggling Year Nine and Ten readers in a low decile New Zealand secondary school. The metacognitive comprehension strategy training framework Transactional Strategies Instruction (TSI) provided the theoretical basis of the project. TSI incorporates teacher-led explicit explanation and modelling of strategies as well as the guided practice of their use by students. The high levels of teacher involvement means that TSI potentially works within Vygotsky's Zone of Proximal Development and is therefore expected to help accelerate student comprehension growth. Developments in adolescent cognitive abilities also support comprehension growth within a TSI-style intervention. A ten week intervention which targeted four metacognitive comprehension strategies was carried out with a group of Year Nine and Ten students across two classes who had a history of reading comprehension under-achievement. The pre- and post-intervention comprehension test results demonstrated that above expected growth was achieved by many of the students as a result of the strategy training. The extent of the movement in student achievement data was significant in relation to national norms. Case study analysis of student think aloud transcriptions and class work revealed that students who accelerated their progress during the intervention were primarily aided by the explicit strategy instruction in that it transformed these students from passive decoders into active comprehenders. For students whom the intervention did not apparently work, factors which negated its success included negative attitudes towards the use of strategies and poor decoding skills. The intervention's results suggest metacognitive reading comprehension strategy training has the potential to improve the comprehension of some underachieving adolescent readers significantly and, considering the duration of the intervention, relatively quickly.

Acknowledgements

It is with sincere gratitude that I acknowledge the many hours of work by my supervisors, Dr Alison Arrow and Dr Brian Finch, which have helped to craft this loose pile of ideas into something that makes sense and will (and already has) improved my teaching beyond the imaginable.

To my principal and HoD, you two inspire me on a daily basis to be better at what I do. Thank you for your professional trust and for letting me 'do-as-I-please'.

Thanks to my BoT who allowed me to have the study leave to finish this. Study leave is a precious commodity and is coming under increasing political and economic pressure but its worth is immeasurable. This time has given me the opportunity to not only assess the best way of teaching kids how to read better, but also the many other aspects of my job. I know that I really just couldn't teach anywhere but here. Thank you for making life-long learning not just an ideal but a reality.

Thanks to TeachNZ as well as the KA North and Purehuroa scholarship committees for paying the bills and tuition fees. It would be impossible without your support.

To the Massey Distance Library Staff, you people are amazing and extramural study would be nothing without your support. Thank you for sending me the same book three times when I have forgotten to write down the reference as well as cancelling inter-loan requests when I have already got the book.

To Mark, Mum and Dad, thank you – you know why.

Dedication

To all the Dub-T kids that I have taught, do teach and will teach, thanks for being amazing.

"You is kind… You is smart. You is important."
-Kathryn Stockett, *The Help (p. 443)*

Table of Contents

List of Figures

List of Tables

Chapter One Introduction

According to international PISA results, New Zealand has some of the world's best adolescent readers and some of the worst (Marshall, Caygill, & May, 2008; McDonald, Thornley, Thomson, Pullar, Pullar, & Low, 2008; Telford & May, 2010). This 'tail' of under-achieving readers is disproportionately large compared to similar nations (Telford & May, 2010). These struggling readers are unable to cope with the many and varied texts from Othello in English to advanced Chemistry textbooks which are simply thrown at them every day in classrooms around the country because many of them do not possess the comprehension skills needed to interact with these texts. In response, many leave school to escape the torture but then are ill-equipped to function effectively in our modern, fast-paced, and highly literate society (Burke, 2007; Deshler, Sullivan-Palincsar, Biancarosa, & Nair, 2007). Even struggling readers who do manage to stay at school are finding that the literacy demands of tertiary education and the workplace exceed their skill levels (Burke, 2007; Deshler et al., 2007).

Alfred Tatum (2008), in his research with struggling adolescent African American male readers, examined the significance of reading comprehension ability. As a part of his study, Tatum worked with a young man who had been involved with the law, whose mother was starting to give up on him and whose father was in jail. After a 10 week reading intervention, this same young man stated that, "I'm starting to think. Before I started reading, I didn't think period. So what I am saying now is I'm starting to think about things. Before I started reading I didn't really care. I just did what I do" (p. 51). The significant implications of the highly developed reading skills that this young man articulated so clearly are also reflected in economic and social statistics. The more literate a student is, the less likely they are to become unemployed, have poor housing, nutrition and health or end up in correctional facilities (Wise, 2009). For example, for every illiterate high school dropout it is estimated that the United States will lose $260 000 in taxes whereas every college graduate will save the state $13 706 in medical care (Wise, 2009). In New Zealand, the under-achieving tail end of the PISA results is over-populated by Maori students and this statistic correlates with Maori over-representation in the tail end of health, poverty and correctional statistics (Statistics New Zealand, 2008, 2009, 2010). It is a vicious cycle. But by finding ways to improve the reading comprehension skills of students so that they are able to start to think, there is a chance to break that cycle.

1.1 Adolescent Literacy

Adolescent literacy has only become one of educational research's 'hot topics' within the last 10 years as international measurements, such as PISA, have highlighted a significant reading achievement issue (Cassidy, Ortlieb, & Shettel, 2011). As a result, research on adolescent literacy, whilst increasing, has been limited and most of the literature, and subsequent government policy, has focused on the tasks performed by younger reader and writers such as decoding and phonics instruction (Conley, 2009; Conley, Freidhoff, Gritter, & Van Duinen, 2008; Pressley, 2006; Wise, 2009). In the New Zealand context, only a small amount of New Zealand based research is readily available (for example McDonald et al., 2008; Thornley & McDonald, 2005).

One of the significant issues for adolescent literacy is that reading instruction often stops when children reach high school; students are expected to know 'how' to read and use this knowledge as the primary vehicle for new learning (Lee & Spratley, 2010; Moore, Bean, Birdyshaw, & Rycik, 1999; Wise, 2009). Secondary teachers are often not aware that the basic skills of reading that are taught in primary schools need to be further supported, practised and refined to enable secondary students to engage with the different structures and contents of subject specific texts. Often, however, the task of teaching students how to comprehend what they read, including specialist subject texts, is avoided. Instead it is replaced by lecturing and simplified notes which allow students to bypass complex text-based experiences (McDonald et al., 2008; Vacca et al., 2000).

The distinct lack of on-going literacy teaching in secondary schools is perhaps due to the lack of supporting infrastructure. For example, there is less governmental money, fewer packaged interventions available and substantially less pre-service and in-service professional development that would result in teachers confidently teaching the literacy requirements of their courses (Pressley, 2006; Shanahan & Shanahan, 2008). Consequently, at a time when the complexity of texts and vocabulary explodes, adolescents are seemingly left to just manage on their own. To stop the resultant flailing, it is vital that we learn more about adolescent literacy and what effective literacy instruction looks like in classrooms (Snow & Biancarosa, 2003).

1.2 The Simple View of Reading

An important conceptual framework which should underpin and focus work designed to improve the literacy skills of adolescents is the Simple View of Reading (Gough & Tunmer, 1986; Wren, 2000). The Simple View of Reading suggests that there are two equally important

but fundamentally different skills which facilitate effective reading: decoding and comprehension (Gough & Tunmer, 1986; Wren, 2000). Each leg of this framework is made up of many parts. For example, successful decoding means that the reader has a strong knowledge of letters, phonology, the Alphabetic Principle and print concepts (Wren, 2000). Whereas comprehension depends upon a reader's linguistic and background knowledge (Wren, 2000). Effective reading relies on both components working efficiently and simultaneously (Gough & Tunmer, 1986; Hoover & Tunmer, 1993; Nation, 2005; Wren, 2000).

Whilst decoding and comprehension are both necessary elements of successful reading there does appear to be a hierarchal order to their development. Decoding is the first step that young readers make towards successful reading (Hoover & Tunmer, 1993; Kamhi & Catts, 2012; Shanahan & Shanahan, 2008; Spear-Swerling & Sternberg, 1996). This initial phase of development is logical because without the ability to accurately recognise the printed versions of words, it seems somewhat impossible to understand their meaning. Consequently, once a student's decoding skills have reached a relatively independent level, comprehension processes, such as summarising, accessing vocabulary meanings and monitoring understanding, begin to develop also (Hoover & Tunmer, 1993; Kamhi & Catts, 2012; Nation, 2005; Pressley, 2006; Shanahan & Shanahan, 2008). With strong foundational decoding and comprehension skills, students are able to further refine their skills, which allows them to access the advanced and sophisticated aspects of subject specific texts that they will encounter in tertiary education and the workplace (Shanahan & Shanahan, 2008).

By the time most students reach early adolescence, they have developed sound decoding skills (Cain, 2010; Gough & Tunmer, 1986; Greaney, 2004; Hoover & Tunmer, 1993; Kamhi & Catts, 2012; Lee & Spratley, 2010; Nation, 2005). Many have begun to develop their comprehension skills also. But for the relatively large proportion of under-achieving and at-risk readers, those readers who represent the tail end of New Zealand's achievement gap, there are significant issues with their comprehension development (Lee & Spratley, 2010). They may lack or inappropriately use their background knowledge (Greaney, 2004; Hoover & Tunmer, 1993; Kamhi & Catts, 2012; Nation, 2005); have vocabulary deficits (Greaney, 2004; Nation, 2005); fail to spontaneously infer meanings from texts meaning that they then miss the main ideas (Greaney, 2004; Nation, 2005); fail to link main ideas within and across texts (Greaney, 2004), and fail to identify or understand how semantic and syntactic structures work (Kamhi & Catts, 2012). Additionally, poor comprehenders will often fail to monitor their comprehension and, consequently, will not deploy fix up strategies to help them understand what they are reading

(Nation, 2005). Consequently, this significant group of students is missing one of the foundational skill sets which would allow them to further develop the literacy skills to participate fully in a global economy. Consequently, for struggling and at-risk readers who have sound decoding skills, the instructional focus must look to develop comprehension skills that students are able to apply flexibly in a range of literacy-based situations (Hoover & Tunmer, 1993; Kamhi & Catts, 2012; Schuder, 1993; Spear-Swerling & Sternberg, 1996).

1.3 Rationale of the Study

The aim of this study was to evaluate to what extent and how metacognitive comprehension strategies could accelerate the comprehension achievement of a group of Year Nine and Ten (ages 12-15) struggling readers in a low decile secondary school. The significance of this project was to assess the extent to which a sample of the 'tail' of New Zealand's achievement statistics would respond to metacognitive strategy training, what elements of the training accelerated student comprehension learning, as well as what factors prevented students from accelerating their learning.

1.4 The Study

This study involved one Year Nine English class and one Year Ten English class (*n*=31 students). They were involved in a ten week intervention which focused on four metacognitive reading comprehension strategies; identifying and using text features, questioning, summarising, and inferencing. The Year Nine class had eight hours of English lessons over a two week timetable period and the Year Tens had seven hours. All students participated in whole class tuition and activities as well as independent practice of the strategies using graphic organisers to support their learning and, finally, one to one training sessions with the teacher.

The study employed pre-test and post-test design using e-asTTle Reading Comprehension (Ministry of Education, 2012) as the data tool. Quantitative measurements of the intervention groups were then compared to the e-asTTle Reading Comprehension national normative trends for New Zealand published in 2010 by the New Zealand Ministry of Education. Case study analysis then examined the factors which both accelerated and delayed students' reading achievement in response to the intervention.

1.5 Overview

Chapter Two (Literature Review) begins by examining the comprehension strategies that effective readers use. It is through the use of these strategies that effective readers begin to

actively engage with the texts that they read. It is inferred that struggling readers do not use comprehension strategies, and by extension, are inactive readers who only passively decode words. Explicit, systematic and intensive strategy teaching has the potential to transform struggling readers into active readers because it tells them that they should be engaging with texts and shows them how to do it. The case is made that metacognitive comprehension strategy teaching, based on models such as Reciprocal Teaching and Transactional Strategy Instruction, offers the most potential to accelerate the comprehension development due to its explicit, systematic and intensive nature. These interventions work within the students' Zones of Proximal Development which nurture their growing cognitive abilities through close interactions with adults who model and explain the processes. This section closes with an account of the literacy achievement gap in New Zealand and proposes that a metacognitive comprehension strategy training intervention has the potential to accelerate the learning of the achievement gap's underachievers. Research questions are then posed which inquire into the extent of the shift in achievement a metacognitive comprehension strategies training intervention can accomplish, which factors facilitated accelerated achievement and which factors impeded comprehension growth.

Chapter Three (Methodology) describes the Year Nine and Ten students who took part in the intervention as well as the research setting and the researcher who was also the classroom teacher. The intervention's procedures for the teaching and guidance of student practice of four comprehension strategies, text features, summarising, questioning and inferencing, are also described. A mixed methodology was employed to investigate the research questions. Pre- and post-test design using an e-asTTle Reading Comprehension test was used to evaluate the extent of the intervention's effect on student comprehension achievement and these results were compared to year level national norms published by the data tool. Case studies of four participants explore which factors contributed to the acceleration of comprehension learning and which factors prevented acceleration. The case studies make use of recorded one to one training session transcripts, student classwork, e-asTTle written answers as well as student reflections to explore the research questions.

Chapter Four (Results) examines how this intervention affected the comprehension development of this group of students. The group made significant gains on the national norms for e-asTTle. Case studies were then able to identify explicit and systematic teaching, as well as the ability of one to one training sessions that allowed the teacher and student to work within the student's Zone of Proximal Development, as effective intervention factors which

accelerated the comprehension learning of many students. Factors such as inefficient decoding skills as well as attitudinal barriers were identified as key factors which limited the effect of the intervention.

In Chapter Five (Discussion), the case is made that metacognitive comprehension strategy training has the potential to significantly move the comprehension of students who are situated in the tail of New Zealand's achievement gap. It does this by making the implicit skills good readers employ spontaneously obvious to students who have failed to acquire these skills naturally. By working within a student's Zone of Proximal Development, the intervention is also able to accelerate the maturation of these skills through interactions between student and teacher. However, metacognitive comprehension strategy teaching is not a magical panacea which will work for all students. Some prerequisites for its success include attitudinal factors as well as efficient and advanced decoding skill. In Chapter Six (Conclusion), the implications of the research are discussed as well as the research design limitations and possible future research avenues.

Chapter Two Literature Review

2.1 Introduction

The literature review begins by outlining the concept of the 'Good Reader' and the strategies they employ to read effectively and actively. The corollary of the 'Good Reader' construct is that struggling readers do not know about or how to use the strategies that good readers do. The role of cognitive development during adolescence and how working within Vygotsky's Zone of Proximal Development can accelerate cognitive skill development is then discussed. An exploration of the importance of teaching good readers' cognitive and metacognitive comprehension strategies to struggling readers to improve their comprehension then follows. How the teaching of strategies may look in the classroom is examined through an analysis of the Reciprocal Teaching and Transactional Strategies Instruction frameworks. Finally, there is an investigation of which strategies offer the most potential to shift student achievement before a discussion of how strategy teaching could potentially lift the achievement of students who find themselves in the tail of New Zealand's achievement gap.

2.2 Comprehension Skills that Adolescents Need - The Concept of the 'Good Reader'

Researchers often use the concept of the 'Good Reader' to help describe the comprehension characteristics of effective readers (for example Pressley & Afflerbach, 1995; Pressley & Hilden, 2006; Tovani, 2000). It is a useful concept in that it provides a framework of strategies which indicate effective comprehension. Characteristics of the good reader include the use of pre reading strategies such as setting a purpose, skimming, predicting and making judgements about the worth of a text in the context of the purpose for reading (Alvermann & Eakle, 2003; Conley et al., 2008; Falk-Ross & Hurst, 2009; Jackson & Cooper, 2007; Lewis & Reader, 2009; McDowall, 2010; Moje, 2008; Pressley & Afflerbach, 1995; Pressley & Hilden, 2006; Stahl & Shanahan, 2004; Thornley & McDonald, 2005; Underwood & Pearson, 2004). Whilst reading, good readers use their prior knowledge, visualise, seek main ideas, monitor understanding, generate questions, clarify, summarize, interpret, evaluate, critique, read selectively, reread, look for patterns, substantiate, adjust understandings, link information to other texts and experiences, and infer to construct meaning as they read and after they finish (Alvermann & Eakle, 2003; Conley et al., 2008; Falk-Ross & Hurst, 2009; Jackson & Cooper, 2007; Lewis &

Reader, 2009; McDowall, 2010; Moje, 2008; Pressley & Afflerbach, 1995; Pressley & Hilden, 2006; Stahl & Shanahan, 2004; Thornley & McDonald, 2005; Underwood & Pearson, 2004).

The identification of such a large number of strategies demonstrates that effective comprehension is defined by active reading (Jackson & Cooper, 2007; Pressley & Hilden, 2006). This means that reading is not simply the passive reception of printed material but is a complex and complicated series of active decisions made by the reader in response to text. Good readers hold these comprehension strategies in their minds as they read and use them to help them understand (Pressley & Afflerbach, 1995). They actively construct meaning as they read, are aware if meaning construction breaks down and how to fix it (Israel, 2008; Pressley & Afflerbach, 1995). Because strategy use is highly situation dependent, readers need to be able to deploy a flexible repertoire of comprehension strategies to cope with the many different text types that they encounter (Alvermann, 2006; Israel, 2008; Pressley & Hilden, 2006; Snow & Sweet, 2003).

Summary and Implication

The concept of the 'good reader' is useful in that it identifies the salient characteristics of effective reading. Good readers use a wide range of reading comprehension strategies which are the tools with which they are able to actively engage with the text. The main implication of this concept is that the struggling reader does not have a large and flexible repertoire of comprehension strategies at their disposal and, consequently, is unable to engage with the text beyond passively decoding the words (Klinger, Morrison, & Eppolito, 2011).

2.3 The Role of Cognitive Development

Reading comprehension is an important cognitive skill which develops over a long period of time. This development, as with all cognitive developments, is usually predictable despite being generally discontinuous as periods of intense development are interspersed with periods of relative stability (Bjorklund, 2005). Adolescence is one of the periods of intense development where the brain is suddenly able to function at much higher levels than previously. For example, adolescents increasingly have the potential ability to focus on one task for much longer periods of time because they are better able to ignore distractions than when they were younger (Bjorklund, 2005; McDevitt & Ormrod, 2002). Cognitive developments support the development of comprehension skills as they provide an optimal environment in which to grow.

One of the important cognitive developments, in terms of reading comprehension, is that many adolescents are increasingly able to think about and understand abstract ideas (Bjorklund, 2005; Falk-Ross & Hurst, 2009; Galotti, 2011; McDevitt & Ormrod, 2002). An important consequence of the ability to think in the abstract means that adolescents are also potentially able to think about and analyse their own learning (Crawford, 2008; McDevitt & Ormrod, 2002). Increases in the ability to reflect upon and learn from one's own thinking provides valuable understanding and guidance on how to think (Crawford, 2008; Galotti, 2011). An example of the effect that metacognitive capacity has is demonstrated in the differing outcomes of teaching cognitive strategies to younger children and adolescents. Small children can be taught cognitive comprehension strategies such as summarising and prediction but they remain unaware that the strategies aid their performance because they lack the cognitive capacity to reflect upon the effectiveness of the strategies (Bjorklund, 2005). During adolescence, however, the reader is increasingly able to understand the abstract nature of how and why these strategies aid their performance. It is this increased understanding which, in theory, promotes enhanced strategic reading and, consequently, effective comprehension (Bjorklund, 2005).

Partnering with this increased ability to think about the abstract, is an increase in the background knowledge of a student, which is a crucial ingredient of successful reading comprehension. This knowledge base comes as a result of age and the associated increase in experiences such as going to the zoo or ordering food at a restaurant (Galotti, 2011). Schema theory suggests that these increases in experience and knowledge allow students to understand more of what they read as old knowledge provides an entry point to understand new information (van den Broek, White, Kendeou, & Carlson, 2009). Existing background knowledge also defines how new information and understandings are assimilated and stored in the brain (Goswami, 2008). Because working memory capacity is limited, new knowledge is bundled into groups, known as schema. It is this bundling by category which allows for fast and efficient access to the stored experiences by the working memory when required in response to the reading experience (Byrnes, 2008; Goswami, 2008; Reeder, Martin, & Turner, 2010; Winne, 2011).

At the same time, for most adolescents, working memory capacity also continues to increase. While small children can hold two pieces of information in their working memory, this increases to seven pieces by the time a child is pre-adolescent (Reeder et al., 2010). The size of this space matters as more items of information can be held at the same time, in turn allowing

greater assimilation of new information introduced by the reading process with old information stored in the memory (Byrnes, 2008; van den Broek et al., 2009). The increases in capacity of working memory space work in tandem with the increasing schematic organisation of existing knowledge in the long term memory to enable adolescents to comprehend more complex texts (Anzures, Lee, & Freire, 2011; Byrnes, 2008; Reeder et al., 2010). The increasing co-ordination of both cognitive processes is further aided by the process of myelination which increases during adolescence (Galotti, 2011). This is a process by which the neural pathways are insulated with a fatty sheath to protect neural links in turn making inter-neuron communication faster and more efficient (Galotti, 2011; Holler & Greene, 2010; McDevitt & Ormrod, 2002; Parris & Block, 2008). Consequently, adolescents are simply able to hold more information and more concepts in their brain as well as more efficiently process and link new information to the background knowledge that the brain accesses in response to the text being read (Bjorklund, 2005; Moses, Carlson, & Sabbagh, 2005). Working memory capacity increases and the processing speed improvements that myelination produces also provides the space for adolescents to think metacognitively and, subsequently, deploy reading comprehension strategies (Anzures et al., 2011; Howe & O'Sullivan, 1990).

A second, and crucial, cognitive development for reading comprehension during adolescence is the refinement of executive functioning. It is this enhancement which allows adolescents to refine their abilities to plan, inhibit undesired behaviours, integrate past knowledge and future goals, behave flexibly, monitor their understanding, as well as detect and correct errors (Baker & Carter-Bell, 2009; Bjorklund, 2005; Galotti, 2011; Goswami, 2008; Holler & Greene, 2010; Moses et al., 2005; Towse & Cowan, 2005). Executive functioning development during adolescence is primarily a period of refinement for these cognitive abilities (Galotti, 2011). In short, adolescents become more self-regulated and systematic in their approach to life in general but also their reading during this time (Goswami, 2008). Consequently, adolescents are able to monitor their comprehension and deploy fix-up strategies more efficiently and flexibly than when they were younger, leading to a further refinement of the strategies which they deploy (McDevitt & Ormrod, 2002; Miller, 1990; Parris & Block, 2008).

The social context in which a child grows up also mediates their cognitive development (Bjorklund, 2005). Bjorklund (2005) notes that different cultures define which intellectual tools are important and guide their children in culturally appropriate ways of thinking, often under the direct guidance of experts within their societies. Reading is an example of one such tool and because reading is "…perhaps the single most important technological skill in post-

industrial cultures" (Bjorklund, 2005, p. 392), in New Zealand's highly industrialised and literate society, the conditions are such that an emphasis on reading education accelerates cognitive growth to enhance reading comprehension.

2.3.1 Vygotsky's Zone of Proximal Development

The cognitive development of children and adolescents can be optimised. Russian psychologist, Lev Vygotsky, hypothesised that children learn best through meaningful interactions with an adult because they are able to achieve more with the adult's help (McDevitt & Ormrod, 2002; Vygotsky, 1978, 1986, 2011). Such interactions consequently accelerate children's learning because they are exposed to the intricacies of tasks and the guidance of the expert helps them to master and then internalise skills so that they can be employed independently. He suggested that children and adult interactions work with a child's Zone of Proximal Development (ZPD). The ZPD and how it operates has important implications for teachers working with struggling adolescent readers as it offers a framework of teaching and learning which can accelerate the cognitive development of adolescents in fields such as reading comprehension.

The ZPD is the zone defined by what a child can achieve when supported by an adult (Byrnes, 2008; McDevitt & Ormrod, 2002; Tudge, 1990; Vygotsky, 1978, 1986; Wertsch, 1985). This zone is underpinned, theoretically, that with the support of a more experienced adult or peer, children can do things that are normally outside their sphere of independent ability because the interaction initiates several developmental processes depending on the activity (Bjorklund, 2005; McDevitt & Ormrod, 2002; Tudge, 1990; Vygotsky, 1978, 1986). For example, a five year old may be able to count to ten but not yet add five and five to find the answer. But, if an adult counts out two lots of five objects such as apples and then guides the child through the process of addition, the child will soon arrive at the answer of ten apples. It is this support and guidance, or educational scaffolding, by an adult which constitutes working within the ZPD. It is this support which is able to accelerate the internalisation of processes and skills leading to optimised cognitive development.

The ZPD functions by fostering the internalisation of complex mental operations that are socially constructed through adult-child interactions (Daniels, 2001; McDevitt & Ormrod, 2002; Wertsch, 1985). Adult-child interactions provide children with a valuable opportunity to watch how adults successfully complete a range of tasks, consequently internalising the key elements of each task. Skills are firstly developed through social situations on the interpersonal plane;

there is a need to talk and discuss the skills and how they should be completed. As the child begins to master the skills they are transferred to and adapted by the intrapersonal plane, finally becoming automatized (Daniels, 2001; Gallimore & Tharp, 1990; Vygotsky, 1978; Wertsch, 1985). For example, as a child develops cognitively they will often talk themselves through tasks and question the adult assisting them. This ego-centric conversation demonstrates that the child is working on an interpersonal plane; they are reliant on the help of others to successfully complete challenging tasks and openly voice this. As they master the skill, interpersonal and egocentric speech is internalised and demonstrates the movement from the interpersonal plane to the intrapersonal; the process has been internalised and the student can now independently function at a higher level (Byrnes, 2008; Vygotsky, 1986). Such development is optimised when the adult is able to guide and scaffold the child's learning within their ZPD leading to the development of new cognitive skills more quickly than if the child were attempting to learn it on their own (Bjorklund, 2005; Vygotsky, 1986).

The ZPD environment fosters higher order, analytical thinking in adolescents because it shows them what they are supposed to do whereas before the adolescents interacted with the adult they remained unaware that could or should think in this manner (Lewis & Jones, 2009; Underwood & Pearson, 2004). The scaffolding which characterises work within the ZPD, gives teachers an opportunity to let students in on the secrets of expert complex text processing in a highly effective manner because it shows students the skills they should be employing (Lewis & Jones, 2009; McDowall, 2010; Moje, 2008; Vygotsky, 1986; Wertsch, 1985). It is this conversation around the learning which is most pertinent (Daniels, 2001). The collaborative environment in which the teacher and student work is able to accelerate cognitive growth because language is the medium in which the knowledge is conveyed firstly between adult and child and then internally by the child (Vygotsky, 1978). It engages both participants in deeper, more effective thinking and talking around the skills and knowledge adolescents need to know (Bjorklund, 2005; McDevitt & Ormrod, 2002). It is this conversation which encourages the social construction of knowledge and skills. It is this conversation which affords the flexibility which is the central concept supporting scaffolding as a successful pedagogical method. For example, through the conversation the teacher is able to identify gaps in the student's knowledge or which processes are going awry. Subsequently the teacher is able to identify and then fix the issue which may be as simple as taking the pieces of knowledge that the child has and guiding the child through the construction of one coherent text interpretation (Gallimore & Tharp, 1990). It is this conversation which allows the teacher to judge the highly individualised and highly changeable ZPD of each student and then work within it (Jackson &

Cooper, 2007; Vygotsky, 1978, 1986, 2011). The conversation is also critical from the student's perspective as it allows them an opportunity to check, confirm and adapt their developing cognitive processes before internalising them (Vygotsky, 1978).

One of the most salient educational implications of the ZPD framework is that the ZPD is a measure of potential achievement; a measure which constantly changes in relation to a child's increasing knowledge and experience base in that the more a child knows and does, the more they can potentially know and do (Vygotsky, 1978, 2011; Wertsch, 1985). Therefore, by working within the ZPD, teachers do not seek to only remediate skills which struggling readers lack but grow individual skill levels relative to where the child has come from, consequently making the growth limitless (Vygotsky, 2011). It places the positive expectation on both the student and the teacher that they will grow student comprehension skills, regardless of level, because by working in the ZPD, students will get teaching tailored to exactly what they need (Vygotsky, 1978, 2011).

Consequently, with this expectation, the teaching and learning that characterises effective work within the ZPD begins with active and guided participation that allows multiple opportunities for a student to master a skill (Bjorklund, 2005; Byrnes, 2008; Gallimore & Tharp, 1990). Multiple opportunities are important as they afford students the opportunity to refine and develop cognitive skills to a higher level with each practice session until the processes finally enter the intrapersonal plane and become automatized (Bjorklund, 2005; Byrnes, 2008; Daniels, 2001; McDevitt & Ormrod, 2002; Vygotsky, 1978). To ensure that students are being taught to their potential, tasks should be challenging enough to facilitate cognitive development but not overwhelm it (Bjorklund, 2005; Byrnes, 2008; McDevitt & Ormrod, 2002; McDonald et al., 2008; Vygotsky, 1978, 2011). Students should not be taught based on what they can do, but rather on the basis of their developing cognitive functions as this constitutes the very best learning as it nudges their development forward (Vygotsky, 1978, 1986). The ZPD, and its inherent scaffolding of student learning, provide a pedagogical framework in which to foster and accelerate learning providing a rich opportunity for struggling readers to begin to catch up to the achievement of their peers.

2.3.2 Teaching in the ZPD: The Power of Thinking Aloud

Thinking aloud represents a potentially powerful method to access and work within a student's ZPD. During think alouds, readers are encouraged to verbally report their thoughts as they read and construct meaning. Popular in cognitive psychology, think alouds are seen as useful

because it is thought that items in the short term, or working, memory are able to be reported orally by the thinker (Pressley & Afflerbach, 1995; Sasaki, 2008). Thinking aloud has powerful significance in the context of the ZPD as by reporting orally what a student is thinking, the cognitive loop that is often hidden is put on display. Dependent on whom the thinker is, think alouds can be useful in terms of experts demonstrating complex cognitive processes or supporting the development of these same processes in younger, or less developed, thinkers.

In the classroom context there are two important think aloud opportunities. The first is during teacher modelling episodes (Klinger et al., 2011). When teachers model what expert readers do, they think about the text using the cognitive strategies good readers use such as summarising or questioning. By modelling these strategies, they are exposing the inner workings of expert and efficient comprehension practices which good readers employ naturally (Tovani, 2000). They are making the implicit, and often inadvertently secret processes, explicit showing struggling readers how to comprehend, and setting the expectation of ways that readers should interact with their texts (Smith, 2010; Vygotsky, 1978, 1986, 2011). Teacher think alouds offer a chance to scaffold or support student learning simply by showing them what to do, when to do it and how to do it (Crawford, 2008; Vygotsky, 1978).

Students, too, can be encouraged to think aloud during their reading (Klinger et al., 2011). By getting students to report their reading practices, it opens up the cognitive loop exposing both understandings and misunderstandings. Student think alouds hold the potential to capture what a student knows and also track how their thinking changes in response to teaching. Therefore, think alouds offer the opportunity to continuously work within a student's constantly evolving ZPD (Chi, 1997). By capturing what a student does well and which elements of comprehension they falter on, a teacher has the opportunity to praise and extend skills that are done well and remediate any problems in a timely manner. The immediacy of feedback and support helps to accelerate the students' cognitive development.

There is some debate over the extent of the completeness of data which think alouds can garner, as cognitive processes that are automatic are often unreported due to the reader's attention being on processes which require more cognitive effort (Anders Ericsson & Simon, 1984/1993; Pressley & Afflerbach, 1995; Wilson, 1994). But when attempting to work in the ZPD to develop cognitive skills, it is more important to focus on the maturing processes than what a child can already do. When a student can verbalise the process they are utilising, this suggests that the process has not yet been fully internalised because it is available for reporting on the interpersonal plane (Vygotsky, 1978). So, while think alouds perhaps hold

limited value in some fields of research, in terms of a reading intervention focused on developing skills, as opposed to developed ones, think alouds reveal the zone of potential that the ZPD symbolises. Consequently, the use of think alouds allows teachers to assess in detail their students' skill levels and respond by flexibly tailoring instruction to work within student ZPDs; the hallmarks of extremely effective teaching (Bauer, Golson-Bradley, & Dillon, 2010; Wharton-McDonald, 2008).

One of the clear implications which think alouds have for classroom practice is that whilst whole class teaching is an acceptable practice for teacher modelling, to hear the intricacies of student think alouds, small group or one to one teaching is vital. There is data which suggests small groups of three students to one teacher are equally as effective in terms of intervention outcomes as one to one teaching (Juel, 1996; Ross & Begeny, 2011; Tunmer & Greaney, 2008; Wasik & Slavin, 1993). Small groups offer the chance for more regular teaching because more students can be taught at one time but one to one teaching offers the chance to deeply examine a student's comprehension practices. Both methods of teaching have benefits, and it is unclear if there is a distinct advantage to teaching struggling readers using just one of the methods.

Summary and Implication

Adolescence is a time of vast cognitive development. There is the increased potential to think in the abstract and increases in executive functioning, for example. These developments offer an optimal opportunity to accelerate the reading comprehension of struggling readers. Vygotsky's ZPD theory suggests that cognitive developments can be accelerated through interactions between adults and children. It is through these interactions that children are exposed to the strategies experts use when attempting to complete complex cognitive tasks. The interaction makes the implicit characteristics of task completion explicit so that the child can see them. If the implicit strategies an effective reader employs can be explained, demonstrated and coached by an adult, the reading comprehension skill of the struggling reader should advance in an accelerated manner. Using think alouds as a teaching and learning tool provides a powerful way in which to effectively work within the ZPD. The implication of using think alouds to access and work within the ZPD is that small group or one to one teaching is necessary so that the intricacies of student understanding can be heard.

2.4 Strategy Training

The important implication of the identification of the strategies which good readers use, as well as cognitive developments and the ZPD theory, is that struggling readers can be taught how to use the techniques, the cognitive strategies, which good readers use to accelerate their comprehension growth (Klinger et al., 2011; Schneider, 2010). There are many cognitive strategies that the good reader employs during efficient reading, as have already been outlined. By teaching struggling readers the cognitive strategies the 'good reader' uses, there is significant potential for them to begin to develop these effective strategies. Strategy teaching brings together these diverse theoretical threads for use in the classroom.

The ZPD theoretical framework suggests that if students are guided through complex cognitive tasks by an adult, they will identify the individual elements of strategies the adult uses to complete these tasks and then adapt and internalise the strategies for their own future use (Vygotsky, 1978, 1986, 2011). Because struggling adolescent readers seem to lack the strategies needed to unlock the meaning of the texts they study (Hinchman, 2008), teacher directed strategy instruction opens up the secrets of academic reading comprehension and improves their abilities by working within student ZPDs (Alvermann & Eakle, 2003; Duffy, 2002; Falk-Ross & Hurst, 2009). Consequently, teachers who model and provide explicit instruction in reading comprehension strategies are the key to improving adolescent comprehension because they show struggling readers how to interact with texts (Archer, Gleason, & Vachon, 2003; Bjorklund, Muir-Broaddus, & Schneider, 1990; Gaskins et al., 1988; Moats, 1998; Moore et al., 1999; Pressley, 2006; Pressley et al., 1992; Spear-Swerling, 2011; Tunmer, Chapman, Greaney, & Prochnow, 2002; Tunmer & Greaney, 2008). It makes the implicit characteristics of effective reading visible for students who have not discovered the 'tricks' of good reading independently (Archer et al., 2003; Klinger et al., 2011; McKenna, 2002; Moats, 1998).

Of equal importance is student practice of strategies. Little will be learnt by students who just watch the experts. Students must be supported in practising strategies themselves during their own reading. By applying their increasing knowledge, they will better understand how the strategies work to support their comprehension construction and this will aid in the internalisation of strategies. Inevitably, as they learn the strategies, students will suffer from cognitive overload as they grapple with this new way of thinking which high jacks their short term memory, leaving little space for actual comprehension construction (Bjorklund, 2005). This can make strategy use and its subsequent development, at times, laborious, however, practise makes the employment of such strategies over time easier as the knowledge of how

to use them is internalised by the student, especially when this practise is supported through the use of student think alouds and teacher guidance and feedback (Vygotsky, 1978). Thus practice is the key to successful strategy development as adolescents build up the knowledge of how and when to use a strategy to successfully solve their problem (Bjorklund, 2005).

2.4.1 Metacognitive Comprehension Strategy Training

To amplify the effectiveness of strategy training students should be taught not only what a strategy is, but how to use it, why to use and when to use it. This procedural, declarative and conditional knowledge develops a student's metacognitive knowledge. The overarching metacognitive knowledge enables students to understand how and when a strategy should be deployed, which develops the flexible repertoire of strategies that is a hall mark of the good reader (Alvermann, 2006; Israel, 2008; Pressley & Hilden, 2006; Snow & Sweet, 2003).

Whilst metacognition naturally improves with age, teaching seems to be able to accelerate this development (Bjorklund, 2005). Analyses of studies involving explicit metacognitive teaching interventions have found mid to large effect sizes such as 0.77, suggesting metacognitive training has the potential to transform struggling readers into successful comprehenders (Baker & Carter-Bell, 2009; Bjorklund, 2005; Klinger et al., 2011). By including a metacognitive element in a comprehension intervention there is significant potential to effect authentic change in the comprehension of students (Gaskins et al., 1988; Greaney, Tunmer, & Chapman, 1997). This is because the explanation of the metacognitive underpinnings of strategies, such as summarising and questioning, transforms student understanding so that strategies become generative, meaning that students deploy metacognitive strategies to monitor their own understanding and fix break downs by independently using the right cognitive strategy at the right time (Gaskins et al., 1988; Greaney et al., 1997; Spear-Swerling, 2011). Essentially, it is the difference between giving a starving person a fish to quell their hunger for a day and giving them the fishing rod and showing them how to fish independently.

The teaching of metacognitive strategy use supports struggling readers who generally do not monitor their comprehension, by getting them to ask themselves questions, such as how well am I doing? Do I need to use a strategy here? Which strategy would work best? Did my selected strategy meet my need? (Bjorklund, 2005; Crawford, 2008; Garner, 1990). Such questions encourage students to begin planning their reading activities, constructing, checking, evaluating, and remediating their understandings, as well as testing and adapting cognitive strategies, such as prediction, as they read (Baker, 2002; Conley, 2009; Pressley & Afflerbach,

1995; Pressley & Hilden, 2006). In short, metacognitive strategy development builds the active element of the good reader (Baker & Carter-Bell, 2009; Dole, Nokes, & Drits, 2009; Pressley & Afflerbach, 1995). But this development is slow and progresses through several stages.

Kelley and Clausen-Grace (2007) suggest that there are four different levels of metacognitive reader. The first level is the tacit reader who has no awareness of their thinking. The second is the aware reader who knows that they do not understand what they are reading but lacks the cognitive strategies to fix the situation. The third level is the strategic reader who uses cognitive strategies to fix up their comprehension. The fourth and optimal level is the reflective reader, who not only monitors their comprehension and engages fix up strategies when necessary, but also selects strategies to help deepen their understanding of the texts that they are reading. What is clear from this stage concept is that the metacognitive strategy development moves from deficient understanding to inefficient use before finally graduating to efficient and independent use by the reader (Garner, 1990). But it is only through practice, trial, and error, which is intensively supported by adults, that students can reach this optimal level of metacognitive development.

Effective fostering of students' metacognitive development operates within the ZPD because adult guidance which demonstrates to students that they should be metacognitive and how to be it. Teachers who explicitly explain the declarative, conditional and procedural knowledge of a targeted cognitive strategy, model the use of the strategy by thinking aloud, scaffold student practice of the strategy, and allow time for independent student practice and reflection, are optimally nurturing the growth of their students' metacognition (Crawford, 2008; Dole et al., 2009; Duffy, 2002; Forrest, 2006; Gaskins, 2003; Jitendra & Gajira, 2011; Kelley & Clausen-Grace, 2007; Klinger et al., 2011; Moore et al., 1999). Such metacognitive explanation and guidance fosters the generalizability of strategies. For example, if a teacher does not explain why it is important to identify prior knowledge, ask questions about a text and summarise what one has read, it is unlikely that struggling readers will independently discover the significance of these cognitive strategies and use them spontaneously. This is despite being encouraged to use such strategies through classroom tasks such as the completion of a K-W-L chart which scaffolds the development background knowledge use, questioning and summarisation by asking students to write down what they know about a topic before reading a text, what they would like to find out as a result of reading the text and, finally, what they have learnt from a text (Kelley & Clausen-Grace, 2007). But without any metacognitive explanation, instruction in cognitive strategies becomes fragmented and, subsequently,

relegated to simple classroom activities; tasks to engage in content but not garner the deep and authentic metacognitive understanding which allows students to use strategies independently and flexibly (Marcell, DeCleene, & Juettner, 2010).

As well as through discussion and think alouds, metacognitive understanding can be facilitated through the use of student learning reflections where students write down the declarative, procedural and conditional knowledge which underpins strategy use and then reflect on how useful strategies were in supporting comprehension construction (Baker, 2002). By reflecting on their strategy use in a written format, students are explicitly encouraged to become better at monitoring their reading so that they are increasingly aware when meaning breaks down and when to employ strategies (Afflerbach, 2002). By reflecting on their strategy use, students are supported to see the value in using the strategies which, in turn, supports their further use, development and increasing transfer to novel settings.

2.4.2 What Does Metacognitive Comprehension Strategy Training Look Like In The Classroom?

Metacognitive comprehension strategy training can take many forms in the classroom such as Palincsar and Brown's Reciprocal Teaching (1983), Guthrie's Concept Oriented Reading Instruction program (2011; Guthrie, Anderson, Alao, & Rinehart, 1999; Guthrie et al., 2009; Guthrie & Ozgungor, 2002; Guthrie, Van Meter, McCann, Anderson, & Alao, 1996), and the Benchmark School's Transactional Strategies Instruction (Baker, 2002; Beard El-Dinary, Pressley, Coy-Ogan, Schuder, & Strategies Instruction Teachers at Burnt Mills Elementary School, 1994; Duffy, 2002; Pressley, 2006; Pressley et al., 1994; Pressley & Hilden, 2006). It is Reciprocal Teaching and Transactional Strategies Instruction (TSI) that will be explored in more detail here. Reciprocal Teaching was chosen as an example of one of the earliest instances of metacognitive strategy instruction which has a strong research basis (Deshler et al., 2007). TSI was chosen also because of its extensive research base (Baker, 2002; Beard El-Dinary et al., 1994; Duffy, 2002; Nokes & Dole, 2004; Pressley, 2006; Pressley et al., 1994; Pressley & Hilden, 2006).

2.4.2.1 Reciprocal Teaching

Reciprocal teaching is one early example of a metacognitive reading comprehension intervention. In theory, Reciprocal Teaching works within a student's ZPD through the use of peer 'experts' who guide their group through the use of a designated strategy (Palincsar, 1987; Vygotsky, 1978, 1986). Reciprocal teaching focuses on building student knowledge of four

cognitive comprehension strategies; summarising, clarifying, questioning and predicting. By firstly teaching students the declarative and procedural knowledge (the what and how) of these four comprehension strategies, students' knowledge of how to engage with a text is then developed through the social interaction of the group which advances each individual's knowledge base (Daniels, 2001; Gallimore & Tharp, 1990; Vygotsky, 1978; Wertsch, 1985) . Students, as a result of the 'expert' guidance, are encouraged to actively monitor their own comprehension which helps to develop their metacognitive skill (Palincsar & Brown, 1983). Reciprocal Teaching demonstrates that it is important to actively read text for meaning and the focus on four strategies at once helps to build flexibility in strategy use (Deshler et al., 2007).

Palincsar and Brown (1983) devised Reciprocal Teaching so that students worked together taking turns leading discussion and modelling the comprehension strategies of summarisation, questioning, clarifying and predicting. Each student was given the role of an expert in one of the four focus strategies and their job was to prompt and guide their group through the use of each strategy. Students were supported by cards detailing their job as well as through teacher modelling and explanation of each strategy (Palincsar & Brown, 1983). Expecting that the four target strategies would strengthen students' comprehension and their comprehension monitoring, Palincsar and Brown (1983) conducted three studies of their Reciprocal Teaching method with Grade Seven students. The first study compared Reciprocal Teaching to more traditional teaching methods which emphasised independent practise by students. They found Reciprocal Teaching achieved greater gains than the more traditional methods. A second study found that, within a laboratory setting, Reciprocal Teaching was able to achieve increased comprehension scores and suggested that these gains were maintained once the teaching period had ended and the skills transferred to novel settings. The third study asked teachers to replicate the procedure in their own classrooms during reading instruction. The findings of the previous two studies were replicated here. The researchers found a large effect size across all three studies (see also Baker & Carter-Bell, 2009).

Reciprocal Teaching incorporates many seemingly successful elements. Several cognitive strategies (predicting, summarising, clarifying and questioning) are taught and continually modelled and fostered by fellow 'expert' students simultaneously (Pressley, 2006; Raphael, Weber, & Nies, 2009). Teacher modelling and explanation, which has already been identified as a crucial element in successfully accelerating comprehension learning, is an integral part of a process that simultaneously encourages text engagement by encouraging students to discuss various points of view and justify them using text based evidence (Alvermann & Eakle, 2003;

Duffy, 2002; Falk-Ross & Hurst, 2009; Moore et al., 1999; Pressley, 2006; Pressley & Hilden, 2006). This discussion, borne out of the dynamic collaborative environment, moves students beyond the simple absorption of reading material to critical engagement with it, forcing students to actively engage with the texts and work together to construct understanding (Baker & Carter-Bell, 2009; Daniels, 2001; Murphy, Grey, & Honan, 2005; Palincsar, 1987; Pressley, 2006; Raphael et al., 2009; Vygotsky, 1978). This is because the collaborative nature of Reciprocal Teaching encourages students to freely ask questions, exchange ideas and build knowledge together, a pedagogical strategy which has reported positive achievement gains for adolescents (Conley, 2009). Reciprocal Teaching's use of the 'expert' who guides students through the deployment of the target cognitive strategies, means that the group potentially works within each student's ZPD, consequently accelerating comprehension learning (Vygotsky, 1978, 1986, 2011).

However, the collaborative learning element of Reciprocal Teaching might not move students who are struggling with their comprehension beyond a simplistic and superficial engagement with the texts they read. Whilst some studies have reported gains in comprehension for students who are using a collaborative method of learning (for example Baker & Carter-Bell, 2009; Palincsar & Brown, 1983), others have suggested that gains have been made only for middle and upper level readers with poorer readers continuing to struggle to develop their comprehension skills (for example Dole et al., 2009; Murphy et al., 2005). One of Reciprocal Teaching's foundational principles is that it works within the Vygotskian notion of expert-led social construction of understanding by turning students into strategy experts (Palincsar, 1987). But it is questionable how effective this collaborative work can be when a teacher is confronted by a whole class of readers who, even with the support of a teacher and a role card, struggle to engage with texts.

Reciprocal Teaching lacks deep teacher involvement and, therefore, possibly does not provide enough of the important expert explanation, modelling, and scaffolding to support struggling readers' growth (Pressley et al., 1992). It is questionable how effectively Reciprocal Teaching works to foster cognitive development within a student's ZPD when it seemingly forces students into the role of the expert prematurely. Consequently, it is doubtful how far students' comprehension will move when they lack the skills to monitor their own comprehension at the most basic of levels in order to even, for example, ask clarification questions themselves, let alone guide the development of other students (Pressley, 2006). More recent research into

effective metacognitive comprehension strategy training has focused on the role the teacher plays in developing students' comprehension.

2.4.2.2 Transactional Strategy Instruction

Transactional Strategy Instruction (TSI) was born out of the research-based remedial reading programs, Students Achieving Independent Learning (SAIL) and Summer Institute of Achievement (SIA), which were implemented in the Montgomery School District in Maryland and out of the programs at the Benchmark School. Both the Montgomery programs and Benchmark program achieve great gains in students' comprehension skills (Deshler et al., 2007; Pressley et al., 1994; Pressley et al., 1992; Schuder, 1993). TSI's inception reflects the widely differing ways in which Reciprocal Teaching has been translated in classroom practice and the ways in which it has evolved since 1983 (Pressley & Hilden, 2006). The primary focus of TSI is the explicit explanation and teaching of comprehension strategies within a flexible teaching structure that is able to respond to gaps in student comprehension skills (Deshler et al., 2007). Designed to promote the use of background knowledge, it is based on teacher-led group collaboration which works within the ZPD more efficiently than Reciprocal Teaching because it allows the teacher as an expert reader to incorporate the opportunistic teaching of multiple strategies fostering flexible, reflective and co-ordinated strategy use by students (Anderson & Roit, 1993; Deshler et al., 2007; Jackson & Cooper, 2007; Lewis & Jones, 2009; Pressley et al., 1992; Vygotsky, 1978, 1986, 2011). By developing students' skill bases over a long period of time, TSI develops deep metacognitive knowledge of the strategies, consequently building student motivation by giving them the confidence and the skills to engage with difficult texts effectively (Pressley et al., 1992; Pressley & Hilden, 2006).

The effective elements of TSI were identified through the close observation of Benchmark School and the SAIL and SIA programs (Pressley et al., 1994; Pressley et al., 1992; Schuder, 1993). Based in Maryland, Benchmark is a school specifically set up for high ability students who demonstrated reading comprehension difficulties after their first couple of years at school. Benchmark focuses on reading strategies that are explicitly explained and modelled to students in great detail by teachers. The SAIL and SIA programs follow the same pedagogical process and were implemented in schools in the Montgomery district for at-risk students (Schuder, 1993). The strategies that are emphasised include decoding (where necessary), summarisation, prediction, story grammar analysis, the use of prior knowledge, setting a purpose for reading, interpretative strategies, visualisation, text structure analysis and self-questioning (Pressley et al., 1992; Schuder, 1993). Teachers focus on a few strategies at a time

and strategies that have been previously taught are revised and maintained regularly (Pressley et al., 1994; Pressley et al., 1992). Such instruction has proven highly successful. Benchmark, whose student population is made up of students who begin in Grade Three, but operate at Grade One level, has a student body who, surprisingly, almost all graduate from high school after 4-7 years at Benchmark during the elementary and middle school grades (Pressley et al., 1992). Similarly, SAIL's results suggest that its teaching practices lead to higher achievement gains than more traditional methods of teaching (Pressley et al., 1992; Schuder, 1993).

TSI's focus on the explicit instruction of strategies and their metacognitive foundations, lets struggling readers in on the secrets of reading in the most explicit and direct way possible effectively showing under-achievers that reading is an active process (Anderson & Roit, 1993; Nokes & Dole, 2004; Pressley, 2002). By explaining the declarative, procedural and conditional knowledge which underpins strategy use, students are given the foundational knowledge of strategies and are able to begin to use them (Anderson & Roit, 1993; Pressley et al., 1994). The metacognitive knowledge that students develop also helps them to reflect on their strategy use, further enhancing strategy development and use (Nokes & Dole, 2004). Often, the explanation of strategies will occur at least three times before students understand them enough to be able to independently use a strategy (Block, Schaller, Joy, & Gaine, 2002). But it is the strength of strategic understanding which gives these struggling readers an entry point to improving their reading comprehension skills and an escape from the frustration of not being able to understand what they read.

Another successful element of TSI is its focus on the guided practice students experience during small group sessions which work within students' ZPDs (Pressley et al., 1994; Schuder, 1993). The negotiation of comprehension construction which occurs during group interactions supports the learning of all achievement levels in that stronger readers encourage, model and explain concepts for weaker readers which also improves the stronger readers' metacognitive knowledge (Pressley et al., 1992). This leads to community generated and negotiated meanings transforming the group from a mere learning tool to a small interpretative community regulated by the need to negotiate and decide together which strategies to employ and when to accept, reject and change text interpretations (Pressley et al., 1992). The long term participation in the group leads to the internalisation of the strategies by allowing multiple opportunities to observe others' use of the strategies, as well as to practice and refine the new skills creating an independent and confident reader (Bjorklund, 2005; Byrnes, 2008;

Daniels, 2001; McDevitt & Ormrod, 2002; Nokes & Dole, 2004; Pressley, 2002; Pressley et al., 1992; Vygotsky, 1978).

The important factor which makes TSI more effective than its earlier forerunner, Reciprocal Teaching, is that it has higher levels of teacher involvement (Duffy, 2002; Snow & Sweet, 2003). The guided practice sessions effectively work within students' ZPDs because the intimate nature of the interaction between teacher and student is able to respond quickly and efficiently to student needs, consequently building strategy and metacognitive ability tailored to the appropriate speed and level for each student (Pressley et al., 1994; Pressley et al., 1992; Vygotsky, 1978, 2011). For example, a good text summary, would elicit a 'please elaborate further' teacher response, whereas a poor summary would receive a prompt to reread (Pressley et al., 1994). The responsive teaching which occurs during the guided practice sessions works within Vygotsky's ZPD, effectively fostering students' cognitive development, as expert feedback on how students are engaging with the strategies and expert feed forward on how to further develop their use, is immediately available.

Student responses to texts are coached by teachers into clearer and more complex interpretations through hints, cues and elaborations as well as more direct instruction when it is needed, than if students had been left to comprehend independently (Bjorklund, 2005; Pressley et al., 1992; Schuder, 1993; Vygotsky, 1986). Metacognitive knowledge of strategies is developed in the same way as teachers ask questions which prompt student reflection on how strategies are used and how effective they are. Examples of questions that teachers use to increase metacognitive knowledge include "what processes did you use? What were you thinking as you read that section? How did you comprehend that section successfully? What are you learning to do to comprehend better? What is bothering you about your reading abilities?" (Block et al., 2002, p. 54). By scaffolding metacognitive reflection in this way, students are encouraged to refine their choice and use of the strategies. The requirement to defend decisions and explain the use of the strategies which have led to those decisions means that the individual's small cognitive loop, which is generally private and where problems can be internalised, is on display to the world (Nokes & Dole, 2004; Vygotsky, 1978). This allows the teacher, and the student's peers, a chance to iron out any wrinkles that may have occurred in the translation from explicit instruction to practice. This guided practice is one of several important teacher actions that help to develop student strategy independence (Duffy, 2002).

TSI goes beyond the basic teacher-directed explain-model-guide mode of teaching and learning (Pressley et al., 1994) and into a space where teacher involvement walks the fine line

between over-involvement which does not develop student skill and just enough involvement to develop students' skill level so that they are able to use strategies independently and flexibly (Pressley et al., 1994). Teachers are repositioned as comprehension coaches whose extensive knowledge base of strategies and their uses is able to flexibly promote student learning by prompting elaboration and explanation of content through the use of comprehension strategies (Deshler et al., 2007; Duffy, 2002). Errors become important cognitive learning opportunities during TSI sessions with the teacher because they expose student knowledge levels and skill deficits that the teacher can then respond to (Pressley et al., 1994). This responsive teaching model fits within Vygotsky's ZPD as students learn at a pace that is largely defined by their responses and then are nudged beyond their comfort zone into new challenges through a series of teacher prompts, questions and hints (Jackson & Cooper, 2007; Nokes & Dole, 2004; Vygotsky, 1978, 1986, 2011). Consequently, TSI becomes generative in that it equips students with an extensive and flexible repertoire of strategies fit for any purpose (Pressley et al., 1994; Schuder, 1993). It allows students to construct their own approaches to reading and to construct their own understandings of readings (Schuder, 1993). TSI enables and empowers students to cope with the many text variables that they encounter and stops teachers from mediating variables by simplifying the text (Gaskins, 2003).

The crucial element of success in these programs is that the teachers are teaching their students to be active readers, teaching them that they must pay attention to what they are reading, and be persistent, reflective and flexible (Gaskins, 2003; Jackson & Cooper, 2007; Pressley et al., 1994; Pressley & Hilden, 2006). This type of teaching is committed to building up student capabilities so that they can be independent learners and react strategically to problems they encounter whilst reading (Schuder, 1993). Consequently, TSI sets higher teacher and student expectations than just the mere remediation of reading comprehension problems (Schuder, 1993; Vygotsky, 1978, 2011). It intends to accelerate student progress by having students improving their achievement levels at least one grade level per year so that struggling readers are able to start to catch up to their more able peers through the use of comprehension strategies (Schuder, 1993).

2.4.3 Which Strategies to Target?

The sheer number of cognitive strategies which the good reader employs makes the teaching of such strategies a daunting task. A starting place is hard to ascertain as often many struggling readers need to develop multiple strategies to improve their comprehension and the choice is made harder because readers' needs vary substantially, leaving the onus on the teacher to

assess what needs to be taught and what does not (Cain & Oakhill, 2009). But there does seem to be increasing consensus emerging from the literature which gives some guidance on where to begin.

One of the key deficits in adolescent struggling readers seems to be inactivity. They often do not monitor their understanding as they read, meaning they often do not recognise that they do not understand and, therefore, are unlikely to remedy the situation (Cain, 2010; Fagella-Luby & Sampson Garner, 2010; Garner, 1990; Lee & Spratley, 2010; Tovani, 2000). Consequently, one of the easiest cognitive strategies which demands students think about what they are reading is summarising. Even simple one sentence summaries have found to have a significant effect on the comprehension of poor readers (Jitendra & Gajira, 2011). Summaries are important as they encourage students to clarify what they are reading by defining, integrating and adapting ideas across the text, thereby encouraging active text engagement (Cain & Oakhill, 2009; Fagella-Luby & Sampson Garner, 2010; Jitendra & Gajira, 2011; Klinger et al., 2011; Tovani, 2000; Zwiers, 2004). It is important to teach underachieving readers that summarising involves the identification of the main ideas in text (Zwiers, 2004). To support this learning and give students practice in summarisation, some activities include categorising ideas from a text, using topic sentences of paragraphs to make summaries, jig-sawing key ideas from texts in small groups, graphic organisers which help students to organise keyword constructions, getting students to write headings for sections of text or simple one sentence summaries (Afflerbach & Cho, 2010; Jitendra & Gajira, 2011; Lee & Spratley, 2010; Zwiers, 2004).

Working on summarisation skills can expose student weaknesses in identifying the main idea as well as a lack of sensitivity to important elements of a text, so it is important to pair up work on summarisation with work on other strategies such as questioning (Klinger et al., 2011). Questioning also supports monitoring by demanding that students ask questions that support them in reading texts by structuring which information is important as answers (Cain & Oakhill, 2009; Tonks & Taboada, 2011; Zwiers, 2004). Therefore questioning helps to clarify important information because it sets a purpose for reading, guiding students by acting as a coarse filter to support the identification of main ideas (Afflerbach & Cho, 2010; Klinger et al., 2011; Zwiers, 2004). It guides the student in what to look for, signals to them what they should be getting from reading the text and what the purpose of reading the text is (Israel, 2008; Zwiers, 2004) .

Importantly, students also need to be taught to ask monitoring questions such as, is the text making sense, what just happened, and what am I supposed to be learning by reading this

text? (Zwiers, 2004). Students can be supported in their questioning development through activities such as hot-seating where students ask a person playing the role of one of a text's characters questions such as how did you do this, as well as, how did you feel about the other characters? (Zwiers, 2004) 'Question the author' is an activity in which the role played is that of the author and questions may include why did you write this? What do I have to know or figure out? (Zwiers, 2004). The use of question starters such as why did the man…, or, why did they continue…, scaffold student learning by giving them a base from which to build their own questions (Zwiers, 2004). As students become more confident in generating their own questions, they could also begin to annotate texts with questions as they read (Lee & Spratley, 2010). By supporting students to generate their own questions when they read, they are able to have a better understanding of texts. They have a reason to interact with the texts, which makes the students active readers (Jitendra & Gajira, 2011).

For many struggling adolescent readers, main idea identification becomes even more problematic as they increasingly encounter advanced texts which ask that they infer the main ideas as they struggle with inference generation (Cain, 2010; Cain & Oakhill, 2009; Jitendra & Gajira, 2011). For example, poor readers often miss pronoun inferences (Cain & Oakhill, 2009). Problems with the integration of ideas across sentences, further undermines inference generation (Cain, 2010; Cain & Oakhill, 2009). Creating connections is the core foundation of inference generation. These connections take three main formats including text to text connections, where readers are asked to draw together the many clues that authors leave in their texts. Readers are also asked to integrate their understandings of the world, as well as their own experiences to understand readings. Teachers can support students in developing their inference skills by developing graphic organisers which guide students in their identification of clues and conclusions to be drawn from them as well as who am I? type clue games (Zwiers, 2004).

To support inference generation, students must also be taught how to make use of their background knowledge. Background knowledge supports student understanding by forming a framework of knowledge which makes the construction of new understandings easier (Bjorklund et al., 1990). This is because a reader's background knowledge affects how they interact with and interpret texts (Smith, 2010). For example, an evolutionist interacts with the bible in a vastly different way to a creationist. Background knowledge includes the use of text structures, words and word forms, genres and sentences, as well as their general knowledge of the world; students need to be shown how to activate this knowledge to help them construct

meaning from texts (Klinger et al., 2011; Lee & Spratley, 2010). Knowledge of text structures is particularly important as they act as signals which guide the reader through the meaning construction process (Cain, 2010; Fagella-Luby & Sampson Garner, 2010; Klinger et al., 2011). A powerful pedagogical strategy to support the use of background knowledge is the use of a graphic organiser, such as a t-chart, which asks students to record text features on one side and the importance of the features on the other, encouraging students to organise their thinking to ensure they make use of their background knowledge (Lee & Spratley, 2010).

Summary and Implication

Struggling readers can be taught to use the effective cognitive strategies which good readers use. Teachers can do this by explicitly explaining and modelling the use of these strategies to make obvious the cognitive processes good readers use and balance this with supported student practice. By explaining the metacognitive elements which underpin strategy use, it amplifies the benefits of cognitive strategy training by helping to make strategy use generalizable to multiple situations. Reciprocal Teaching and TSI are two successful teaching programs which make use of metacognitive strategy training to accelerate the comprehension learning of at-risk readers. A key component of TSI, and its main advantage over Reciprocal Teaching, is that it has higher levels of teacher involvement ensuring expert advice and guidance that is responsive to student needs. Higher levels of teacher involvement and metacognitive training should accelerate the learning of struggling readers. But the sheer number of cognitive strategies that good readers use presents a somewhat overwhelming teaching task. Research suggests that summarising, questioning, inference and the use of background knowledge provide a useful starting point to begin teaching struggling readers how to enhance their comprehension.

2.5 New Zealand's Achievement Gap and Metacognitive Comprehension Strategy Training

The adolescent literacy environment in New Zealand represents some significant challenges. On one hand, not all students lack the literacy skills that will render them successful. New Zealand's PISA results show that many of our students are highly successful readers (Marshall, Caygill, & May, 2008; McDonald et al., 2008; Telford & May, 2010). But it is the widening gap between the good readers and the 'not-so-good' readers which is concerning parents, teachers and politicians. Considering the literature outlined here, it is plausible to hypothesise that many of these 'not-so-good' readers are not active comprehenders who engage with texts by monitoring their understanding. Many factors contribute to this gap.

One important causal factor in this situation seems to be that many of the students who struggle with their comprehension also come from low income families (Deshler et al., 2007). Despite parents' best intentions, but because of limited funds there are few literacy experiences, such as reading books or experiences such as zoo visits, which build the background knowledge to understand texts, and this impedes students' early literacy skill development (McDevitt & Ormrod, 2002). Early impediments to reading development then affect later reading development because students simply lack the foundational skills to enable to future improvement (Stanovich, 1986). Additionally, this lack of literacy experience gives children the impression that reading is not a valuable skill and, consequently, they attribute little importance to its development (Vygotsky, 2011). The combination of these factors limit their readiness to benefit from formal reading instruction, potentially leading to years of populating the lower echelons of the achievement statistics (Vygotsky, 1986, 2011). But these factors should not mean that adolescent readers who are struggling should be left to struggle, or that the teaching community should accept that some readers will always be worse than others.

Struggling and at-risk adolescent readers who represent the tail of New Zealand's achievement gap can be taught how to improve their reading. But in teaching students the comprehension skills they need to progress their reading ability, teachers will need to have the "…fearless expectation that all students will learn" (Jackson & Cooper, 2007, p. 247) which will stop teachers simply accepting students' current literacy skills and, subsequently, dumbing down the literacy element of secondary school courses. Adolescent cognitive developments represent an opportunity to teach students new ways of thinking. It is important that cognitive developmental models are taken into account and that they guide the development of effective teaching and learning programmes (Davis & Winstone, 2011). High quality teaching which guides and monitors student learning is crucial if students are to be armed with the necessary skills which allows them to develop effective reading comprehension ability (Byrnes, 2008; McDevitt & Ormrod, 2002).

Summary and Implication

New Zealand's achievement gap means that a significant number of our students are struggling readers. Factors such as low socio-economic status contribute to this situation. But adolescent cognitive developments and the potential of metacognitive comprehension strategy training which is heavily led by the teacher and works within student ZPDs, means

that this situation is far from a *fait accompli*. There is real potential to accelerate the learning of these underachievers and close the gap.

2.6 Summary of Literature Review

By using the concept of the 'Good Reader' it is possible to identify the strategies and techniques that good readers use and struggling readers do not. Cognitive developments and the use of Vygotsky's Zone of Proximal Development can be used to help struggling readers learn how to effectively interact with texts by using the cognitive and metacognitive strategies good readers use. Programs such as Reciprocal Teaching and Transactional Strategies Instruction demonstrate how this can be done and give an indication of the potential outcomes of teaching students in this manner. Out of the multitude of strategies that could possibly be targeted, summarisation, questioning, inference generation and the effective use of background knowledge potentially offer the best starting point to begin to develop the comprehension of struggling readers. Within the New Zealand context, metacognitive comprehension strategy training offers real potential to overcome the barriers to effective comprehension development, such as low socio-economic status, and accelerate struggling readers out of the country's achievement gap tail.

2.7 The Research Questions

The salient theme emerging from the literature is that metacognitive comprehension strategies instruction which operates within students' ZPDs, offers the most potential to improve the achievement of struggling comprehenders. It is therefore hypothesised that a metacognitive reading comprehension strategies intervention which involves explicit and systematic instruction in strategies and aims to work within students' ZPDs, will aid the comprehension growth of a small group of underachieving readers in a low decile, rural, co-ed secondary school who are representative of New Zealand's achievement gap tail. Consequently, the research questions are:

1. To what extent will a metacognitive comprehension strategies training intervention accelerate the comprehension achievement of this group of struggling readers?
2. Which factors of the intervention encourage the acceleration of comprehension achievement? How do they encourage achievement acceleration?
3. What factors impede the ability of the intervention to accelerate student achievement? How do they impede achievement acceleration?

Chapter Three Methodology

3.1 Introduction

A mixed methods case study approach was taken to investigate this research question. The study centred on a 10 week metacognitive comprehension strategy training intervention. Quantitative pre- and post-test data was used to evaluate the extent of the shift caused by the intervention. Case studies, employing transcripts from one to one think aloud sessions, student classwork, reflections and e-asTTle answers, were used to gather evidence about factors which made the intervention effective and which factors impeded student comprehension acceleration. It was felt that mixed methods was the best methodological approach to examine these research questions as it could assess how well the intervention worked and how it affected the comprehension development of subcategories of struggling readers (Gorard & Taylor, 2004; Lodico, Spaulding, & Voegtle, 2006).

3.2 Research Setting

The research setting was a small co-educational high school in the rural North Island. It had a roll of approximately 340 students and was decile two indicating that it was situated in a low socioeconomic area (Education Review Office, 2007). The school's roll was comprised of approximately 55% Maori and 45% New Zealand European/Pakeha (Education Review Office, 2007) . The school's reading achievement data suggests a historical trend of underachievement in reading comprehension at Year Nine and Ten.

3.3 The Researcher/Teacher

The researcher was also the classroom teacher for the intervention. She had worked in the school's English department for seven years when the intervention occurred. Because of the potential for imbalances of power as a result of the conflict of interest, ethical approval was sought from the Massey University Human Ethics Committee to ensure that the interests of both the students and the researcher/teacher were safeguarded. Special consent measures were introduced to help ensure these interests and will be discussed in the ethical consideration as well as the participants sections (see Appendix A for the committee's approval statement).

3.4 Participants and Sampling Method

A group of Year Nine and Ten students in two mixed-ability classes formed the research group for this study. This group was characterised by underachievement in reading. For example, the Year Ten group began the intervention 87 raw score points behind the national norm on an e-asTTle reading comprehension test, a nationally supported assessment tool for reading comprehension (Ministry of Education, 2010). The Year Nine group began 112 raw score points behind the national norm (Ministry of Education, 2010). The aggregated e-asTTle data of all students from both classes was used by the researcher/teacher to assess the extent of the effect of the intervention. The larger number helped make the shift analysis more statistically reliable. Permission to use this data was given by the school's principal.

Data from 44 students was collected before the intervention began. This data set was comprised of 26 Year Nine students and 18 Year 10 Students. In the Year Nine group, during the intervention two students moved out of the school, another to a different class and a further two did not return any results on their first e-asTTle test. In the Year 10 group, one student was moved to another class and four were not tested at the end of the intervention due to long term absences. A further three students who were tested before and after the intervention were eliminated from the data set as they had less than 60% attendance and this was felt to be a mediating factor in their reading achievement. So from a starting total of 44 students, the post intervention analysis was based on the aggregated e-asTTle achievement data of 31 students.

From this pool of 31 students, nine students also gave their consent for their e-asTTle achievement data, one to one training session transcripts, classwork and reflections as well as their e-asTTle answers to be considered as case studies to investigate the factors which accelerated student achievement during the intervention and factors which hindered it. Case study consent was given on the understanding that the researcher/teacher did not know who had consented to participating as a potential case study until after the intervention. This strategy was deployed to mediate the conflict of interest caused by the researcher fulfilling both the role of researcher and classroom teacher. Both student and caregiver consent was sought during this process.

Purposive sampling was employed to select case study key informants. Four key informants were selected from the pool of nine consenting students. The four case studies represented two distinct sub sets of the data. The first group was defined by students who made significant

progress in comparison to the national e-asTTle norms (Ministry of Education, 2010). The second group was comprised of students who did not make the same significant progress in relation to the national norms. Initially, three case studies from each sub set were selected to develop the emergent ideas and allow for theoretical saturation; however, it was found that theoretical saturation occurred after the discussion of two case studies in each subset (Onwuegbuzie & Collins, 2007; Onwuegbuzie & Leech, 2007). Participants were chosen based on the richness of their data to help legitimize the data analysis (Onwuegbuzie & Leech, 2007; Sharmini & Kumar, 2011). Both subsets were subsequently compared and contrasted to see how metacognitive comprehension training affected comprehension development.

3.5 Data

Four types of data were collected. To investigate the first research question, the extent of the shifts caused by the intervention, e-asTTle reading comprehension achievement data was collected before and after the intervention. Case study data which investigated the last two research questions included the transcriptions of one to one training sessions, participants' reflection journals, classwork, e-asTTle answers and the researcher/teacher's field diary.

3.5.1 e-asTTle Reading Comprehension Achievement Data

The e-asTTle Reading Comprehension test (Ministry of Education, 2012) was used to collect quantitative data before and after the intervention to measure the shifts in reading achievement of all students who were exposed to the intervention (Cohen, Manion, & Morrison, 2007). The written answers of case study participants' post intervention tests were also analysed to help investigate how the intervention affected their skill development.

e-asTTle is a New Zealand designed reading comprehension test which asks students to respond to a range of multiple choice and short answer questions that check their response to a range of narrative and expository texts. The test is aligned with the New Zealand curriculum and students sit differing tests according to their ability. Test scores across differing tests are made comparable due to the use of item response theory which weights harder questions with more points and easier questions with fewer points. An e-asTTle raw score is calculated from student responses and a score between 1000 points and 1800 points is given (Ministry of Education, 2012). This tool, because it is based on the New Zealand English curriculum has a range of skill strands that can be specifically tested such as 'Ideas' or 'Purposes and Audiences'. For the purposes of this study, and in line with the research setting school's normal practice, the strands of 'Processes and Strategies' as well as 'Ideas' were focused on. These strands test

the reading comprehension skills, such as inference and selecting ideas and information, which students will need as they encounter a wide range of texts.

This tool was administered according to the guidelines written by the test publishers and administered online before the intervention. All students sat the post-test on paper at the end of the intervention due to the unavailability of computer resources to sit the test online. e-asTTle is designed to be completed either online or in paper version and, consequently, the different mediums should not have affected the outcomes of the test (Ministry of Education, 2012). e-asTTle was selected for use in this study because it has already been tested for validity and reliability as well has having national year level norms (Cohen et al., 2007; Ministry of Education, 2012).

3.5.2 Transcriptions of One to One Training Sessions

Because the quantitative data could not examine the complexities of how metacognitive training affects comprehension development (Krathwohl, 2009), a significant part of this study involved the analysis of transcriptions of the one to one strategy training sessions in an attempt to identify factors which caused and hindered acceleration. Each student took part in up to four of these training sessions. During these sessions, students were asked to say aloud what they were thinking as they read and constructed meaning, with a particular focus on the target comprehension strategies. Subsequently, these training sessions were able to provide information on how the comprehension processes worked in student's minds in so far as they were able to articulate them and how these processes developed as a result of the intervention (Chi, 1997; Marr, 1983; Pressley & Afflerbach, 1995; Sasaki, 2008).

In order to encourage students to think aloud about their reading comprehension, they were instructed to be a reading commentator and to commentate on the target comprehension strategies. Thinking aloud was also modelled by the researcher/teacher during whole class instruction as well as during the one to one training sessions. Reading commentating was explained in the context of a rugby league or other sports commentator in an attempt to hook onto students' background knowledge so that they understood what to do, such as in this excerpt from one of the training sessions:

Teacher:	What I want you to do is to read silently until, um, about the end of the chapter nine and as you read, do you know what a commentator does?
CS3:	[Silence]
Teacher:	Do you watch league and rugby?
CS3:	Oh, does it like check the score…

Teacher: Yep but do you watch league and rugby?
CS3: Oh, not really.
Teacher: Ok, do watch netball or anything like that?
CS3: Yep.
Teacher: Ok, so a commentator in netball tells you what's going on in the game; 'oh there's a pass to Tutaki there's a pass to Latu', all that kind of stuff. So, they tell you what's going on. That's what I want you to do with your reading. But I want you tell me about two special things, and one is text features. If you see them and what you think they mean. And the other thing is any questions that you have about the story, ok?
CS3: Yep.

Very little training was given to students on how to think aloud as they read, in accordance with the suggestion that because thinking aloud is a reflection of what participants are doing anyway, little to no training needs to be completed prior to beginning their collection (Anders Ericsson & Simon, 1984/1993; Marr, 1983; Pressley & Afflerbach, 1995). Students were directed to specifically focus on reporting their use of the target comprehension strategies. Additional instructions were also given to support students to report their thinking such as "when you're stuck, tell me…" and "give me a commentary of what's going on inside your head as you read" or "say out loud, whatever is going on inside your head" (Anders Ericsson & Simon, 1984/1993). Because of the highly interactive nature of the training sessions, the think alouds were not simple accounts of what a student could do at a given point in time, but opportunities to refine student understanding and develop their knowledge further. Consequently, teacher prompts were an integral part of the intervention to explain and model to students how to use the strategies, remind students to use them as well as to elicit more complete information from the students to demonstrate their understanding of how and why to use the strategies. Examples of such prompts included "can you explain what you mean?" (Anders Ericsson & Simon, 1984/1993; Marr, 1983). Prompts were recorded as part of the transcriptions to help explore how student's comprehension developed as a result of the intervention (Anders Ericsson, 2002; Chi, 1997).

3.5.3 Student Reflections and Classwork

To further investigate the second and third research questions, students were asked to write learning reflections after they had completed independent silent reading, to encourage the practice of their strategy use. Reflection was intended to help increase the metacognitive aspect of the intervention by encouraging students to monitor and evaluate their strategy use

(Afflerbach, 2002; Baker, 2002). The reflections were also intended to support the data collected from the think alouds by adding further detail.

To make the reflections as rich a source of data as possible, a writing scaffold was used to support and teach student reflection (O'Toole & Beckett, 2010). Writing prompts included:

> Today I read…
> I found this reading… (hard, easy, boring, interesting etc.)
> When I found the text a bit hard, some issues I had were… (describe what the issues were)
> In reaction to these issues, I… (describe the strategies that you used)
> I found that my reaction … (helped, didn't help etc.) because … (explain why or why it did not work)
> If I had the same issue in the future, I would … (use the same strategy or a different one) because…
> Other places I would choose to use this strategy are … because…

Additionally, the classwork of the case study participants was also collected and analysed by the researcher/teacher to investigate the extent and quality of independent strategy use. The class work which was collected took the form of the graphic organisers that the researcher/teacher had developed to support students to practice the target strategies during independent reading time.

3.5.4 Field diary

A researcher's field diary was also kept during the intervention period to help identify factors which accelerated and hindered learning during the intervention. This recorded details of the social contexts, classroom and school events, researcher reactions, experiences and initial evaluative thoughts (Gay, Mills, & Airasian, 2006; O'Toole & Beckett, 2010). Notes were written within 24 hours of each lesson in an attempt to ensure their accuracy (Gay et al., 2006; O'Toole & Beckett, 2010). Some guiding questions were employed to ensure the completeness of data (Gay et al., 2006; O'Toole & Beckett, 2010). These included:

> What was going on? What was the nature of the conversation? What were people saying or doing?
>
> How did the participants interact?
>
> What was the tone of the session?
>
> What beliefs and attitudes were evident?
>
> Which texts did we read today? What possible strategies were encountered, or could be encountered, during this reading? How did students react to the text content?

How much teacher prompting and probing was necessary? Why? What was the teacher's level of participation in the lesson?

What levels of metacognition were evident in the conversation?

3.6 Research Intervention

A ten week intervention period was instigated where all students in the two classes participated in a reading program which followed the theoretical framework of Transactional Skills Instruction. The intervention took place during students' regularly timetabled English classes. The Year Nine students had eight hours of English time over a ten day timetable and Year Ten students had seven hours. During this time, there were also many interruptions to the school timetable such as the school's athletics day, teacher only days, public holidays, as well as an unexpected storm day which closed the school; these interruptions inevitably reduced the amount of time the students had in the intervention but also reflect the normal workings of New Zealand secondary schools.

Four comprehension strategies were identified as needing development through e-asTTle data and teacher observation of the students before and during the intervention. The four focus comprehension strategies were; looking for text features, wondering / questioning, summarising and inferencing. Each received targeted teaching for two weeks and the final two weeks of the intervention was given to the explicit teaching of using all strategies together. The texts that were used during this time included year level class assigned novels, short stories and articles that examined the themes of family and superheroes for the Year Nines and family and drunk driving in Year Ten. Additionally, there were lessons, more so during the second half of the intervention, where once a week the classes would have free choice of their reading in the school's library to further practise their strategy use. The teaching activities which helped to develop each skill are described below.

Summarising

Summarising was the first target strategy. Summarising offered a useful starting point for students as the pre-intervention e-asTTle data suggested that students had problems identifying the main ideas of texts. Summarising was chosen as an entry point for strategy teaching because of its ability to support students to improve their ability to identify texts' main ideas. Summarising teaching began with the procedural, declarative and conditional knowledge of summarising being explained to students by the teacher. Notes outlining this knowledge were then copied off the board by students to help them cement this information

in their minds as well as to act as a reference guide to refer back to. The teacher modelled how to summarise during a think aloud to the whole class. Modelling often occurred more than once so that students were able to get a much stronger idea of how each strategy worked.

Students were then asked to begin to practise summarising during independent reading time by writing one line summaries on post-it notes (adapted from Tovani, 2000). Year 10 students were also asked to complete five line summaries so that their summaries were more detailed. Students were scaffolded in their work through the question, 'what is the main idea?', using the question words, who, what, where, why, when and how, to scaffold their thinking in terms of what was important as well as classroom discussions and teacher feedback on their post-it summaries. After practice sessions, and about once a fortnight, students were asked to write reflections on their learning which described the strategy they had been using, how it worked, how it helped their learning as well as any further questions they may have about specific strategies. These learning reflections were heavily scaffolded through teacher explanation and modelling as well as the use of sentence starters.

Additionally, during independent reading time where students practised the strategy, primarily by writing one line summaries on post-it notes, individual students were asked to come and work with the teacher in one to one training sessions. During these 15-20 minute sessions, the student was asked to summarise each page which provided the starting point for a conversation which could include teacher modelling and explanation of the strategy as well as guidance, prompting and encouragement of students' use of it, depending on student needs. It was intended that all students should complete at least three one to one training sessions during the course of the intervention but in real terms the practicality of this was intention was unrealistic. In the larger Year Nine class, there was only time to complete one or two think alouds for each student. In the smaller Year Ten class, which also included a relatively large group of long term absentees, students with good attendance received the three one on one training sessions.

Although summarising was the first target strategy, as a result of student one to one training sessions and information taken from the students' reflections, it became apparent that students had not grasped how and why to do summarising very well once the targeted teaching of the second strategy had begun. So, summarising was revisited as a target strategy and this resulted in much greater understanding of the strategy by students as revealed through the one to one training sessions. No other strategies were revisited in this way

although greater care was taken by the researcher/teacher to explain why and how strategies could help comprehension as a result of having to revisit summarising.

Looking for text features

The second target strategy encouraged students to make use of the text features on the page that they read, for example emboldened font, italics, punctuation marks and images. This strategy was chosen because teacher observations during the one to one training sessions as well as pre-intervention e-asTTle data suggested that students were not making use of this information to help them identify and understand the main ideas in texts. Teaching of this strategy followed the same format as summarising through teacher explanation of the metacognitive aspects of the strategy which were then copied down in note format by students. The strategy was modelled by the teacher and students given time to practise it independently, with individual students also completing one to one training sessions during this time. Students were also asked to reflect upon the use of this strategy.

Several pedagogical strategies were used to support students' strategy use and development during their independent reading time. The first was the highlighting of text features that students identified in photocopied texts. Students were then asked to annotate their highlighting with what they thought the text feature showed them, for example, 'these italics show me that the character is thinking in their own head' (adapted from Tovani, 2000). Additionally a T-chart, referred to in this intervention as a double entry diary, was used to support students by asking them to record the text features they identified on one side of the chart and the meaning of the text feature of the other side (Tovani, 2000; refer to Appendix B for examples of the graphic organisers which were used).

Wondering / questioning

The third strategy which was targeted was wondering / questioning. This strategy was taught because questioning helps readers to monitor their understanding, identify main ideas more easily as well as motivating readers to read. The same format of explanation, notes, modelling, guided practice during independent reading and one to one training sessions and then reflection was employed. To support students in their independent practice, they were instructed to write questions on post-it notes at the end of each page of text they read as well as record questions and answers on double entry diary charts. They were also asked to write comprehension questions for other students in the class to answer. A triple entry diary in which students were required to write questions in the first column, the answers in the second

column as well as any text features they identified in the third column also encouraged not only the use of questioning but the use of two strategies at once (refer to Appendix B).

'Hot seating' and 'question the author' were also deployed as teaching activities to encourage students to use questioning to support their reading (Zwiers, 2004). During hot seating, the teacher took on the role of one of the characters in the class text and students asked the character questions such as "why aren't the characters allowed to go to school?" and "what will happen if the government gets them?" in response to the text *Boy Overboard* (Gleitzman, 2002), a book about a family escaping Taleban Afghanistan. Question the author took the same format except the teacher took on the role of the text's author and was asked questions such as "why did you write this book?" or "what am I supposed to learn from reading this book?" Both activities were scaffolded with teacher written seed questions which students could use as starting points.

Making inferences

The final target strategy of the intervention was inferencing. Despite the e-asTTle results suggesting this skill was not an issue, the one to one training sessions demonstrated that the students struggled with inferences such as pronoun inferences and those which supported the identification of main ideas. Again, the same explain, model, notes, practise, reflect format was employed to support student learning of inference skills. Specific teaching activities to encourage inference development included a who/where/what am I? game where students were asked to write a series of clues that would lead to an inference generated answer. Graphic organisers were also used to support students in their understanding that inferences are generated from a number of clues (Zwiers, 2004). Additionally, students were also given inferences based on the texts that were assigned in class and asked to work backwards by identifying the clues that formed the inference.

Using all four strategies simultaneously

Although the use of several strategies at once was modelled by the researcher/teacher during whole class teaching think alouds throughout the intervention period, during the last two weeks the students were guided to put all four strategies to use simultaneously when reading. The teaching of the simultaneous use of the strategies was designed to show students that good readers use several strategies when they read. In short, supporting students to use several strategies simultaneously was intended to support the development of a flexible repertoire of comprehension strategies that readers could then deploy in various situations. Teacher explanation and modelling as well as guided practice and reflection aided students in

this endeavour. A graphic organiser was also used to guide and remind students to use all four strategies (refer to Appendix B). Students were told that although this organiser suggested a certain way in which to employ the strategies, each of the strategies could and should be used at any time before, during and after the reading process.

3.7 Ethical issues

There were two main ethical issues which were considered prior to the commencement of this study. The first was a 'conflict of interest' issue as it was proposed to undertake research which represented a large part of the work for a Masters' degree, in the school and classroom in which the researcher also worked. In the Massey University Code of Ethical Conduct for Research, Teaching and Evaluations Involving Human Participants (2010), there is an expectation to avoid such conflicts of interest as the ramifications could include students feeling pressured to consent to participating or suffering substandard teaching and learning experiences.

However, there is research to suggest that the benefits of a conflicted study may outweigh the potential negatives. Teachers are teachers foremost and their own ethical boundaries should inherently maintain the delicate balance between the quest for knowledge and the need to nurture their students which can ensure commitment, honesty and openness on the behalf of the researcher (Ntseane, 2009; Vincent & Warren, 2005; Zeni, 2005). Additionally, the relationship of the insider researcher and the potential participants could actually foster collection of data that is richer and truly depicts the setting in which it was collected (Bledsoe & Hopson, 2009). This type of rich data has the biggest potential to aid in the design of courses for the students who are involved in the study in order to improve their learning experiences as such research offers a chance to closely examine educational practice in order to make improvement (Alton Lee, 2001). But teacher/researchers must act with extreme care (Alton Lee, 2001; Hedges, 2001). Consequently, this research used the best practice findings from international research to assess the extent to which metacognitive comprehension strategy training could improve the achievement of struggling adolescent readers in a low socio-economic context. The use of international findings limited the potential for negative effects from the outset of the study because those findings strongly suggested that such instruction would benefit students.

Despite this intervention representing best practice theory, one of the issues that still needed to be carefully addressed was the potential for unbalanced power relations (Oliver, 2003).

When power relations become unbalanced, students may feel pressured to participate, in turn, impeding their right to freely consent. Consequently, it is important that researchers ensure that research is completed as ethically as possible to avoid or minimise possible negative consequences (Oliver, 2003). One of the ways in which this study sought to overcome the potential of unbalanced power relations was to seek the consent of the school principal for the use of the students' aggregated achievement data. The principal was seen as a key gate-keeper whose interests were considered to primarily lie in protecting the students in their care (Alton Lee, 2001; Hay & Israel, 2006; Oliver, 2003). In obtaining the consent of the principal, it suggested that she thought the use of the student data to investigate the effects of a best practice teaching practice intervention such as this was of benefit to the students and, therefore, ethical in nature. Because the principal was able to judge the research in this way, it was thought to be ethical to seek their consent on the behalf of the students to make use of the aggregated e-asTTle data involved in the intervention to increase the validity of the statistical analysis (Collins, 2009).

Although it was considered that this intervention posed little potential to negatively affect students, it was felt to be unethical to only seek the principal's consent when it came to considering the case studies. Consequently, for this study students were informed of the aims of the study as well as its procedures and asked to participate as case studies. To avoid influencing students unduly, information about the research was disseminated by the school's remedial reading teacher aide as she was seen to have less power over the students because she was not their everyday classroom teacher assigning grades and writing their reports. Students were also asked that if they wished to participate as a potential case study, to return their consent forms to the school office which held them until the end of the intervention. This meant that the researcher/teacher did not know who had and who had not consented to participating, ensuring all students were treated equally during the intervention.

The second salient ethical issue concerned the ability of the participants to give informed consent. The study was focused on 13 and 14 year old adolescents. This age group represents a potentially vulnerable group of students and yet, it is also an age group which is on the threshold of adulthood. It was also felt that the alternative of not studying these students because of their age could have severe repercussions. For example, medical research which avoided studying schizophrenia in adolescents, children and infants because of potential ill effects meant that hypothetically powerful research which could aid in treatment advances was not conducted and the young people were negatively affected by this research as they

missed out on potentially life changing opportunities (Kopelmann, 2006). The tension between the rights of participants must be carefully balanced with the greater good (Kopelmann, 2006). The Massey University Code of Ethical Conduct guidelines (2010) also provided direction in that it suggested that this study and its damage potential was of low risk to participants.

In response to this issue, careful negotiation of informed consent supported by the oral explanation of the intervention by the teacher aide and student-friendly information sheets and consent forms, the use of parental consent in support of the students' own consent (Hedges, 2001; Loveridge, 2010), as well as the researcher not knowing who had consented until the end of the intervention period, all worked to ensure the safety of both participants and non-participants during the research period. Full ethical approval from the Massey University Human Ethics Committee was also sought to ensure the concerns surrounding the insider research were mediated (see Appendix A). Additionally, to protect the identities of the participants, the name of their school and their names were not used in the reporting and discussion of the findings of this research report. Only limited demographic data describing the school's population was used to locate the research in its setting in an attempt to keep the school's identity also anonymous.

Chapter Four Results

4.1 Introduction

To determine the extent to which the students' achievement shifted as a result of the intervention, a means analysis of the pre- and post-test aggregated data of both classes is presented. The data is then disaggregated into year level groups so that comparisons against the e-asTTle national norms can be made. Finally, to explore the underlying factors which supported successful outcomes and also negated success, four case studies of consenting participants are then presented. Two explore the factors which supported success and two investigate factors which negated accelerated comprehension learning. One to one training session transcripts, participant class work, reflections and e-asTTle data informed these case studies.

4.2 e-asTTle Data

A means analysis was carried out on the e-asTTle data of both the Year Nines and Tens as a whole cohort of students (*n*=31) to garner overall trends in achievement. The means analysis suggests how the students reacted to the intervention and is summarised in Table 1 below.

Table 1.

Whole Cohort Means Analysis of e-asTTle data

	Pre-test		Post-test	
Group	*M*	*SD*	*M*	*SD*
Intervention group	1403	63.68	1447	56.15

The average shift in achievement for the whole cohort is 44 raw score points. The e-asTTle tool suggests that any movement of more than 22 points represents a statistically significant change in student understanding, therefore this cohort's e-asTTle movement suggests that the intervention significantly developed their reading comprehension abilities (Ministry of Education, 2012). The pre- and post-intervention mean scores and standard deviations were used to calculate the Cohen's *d* effect size using Becker's (1999) calculator. The effect size of the intervention is 0.73.

4.2.1 Year Nine and Ten Disaggregation

To judge the significance of the effect of the intervention, Year Nine and Ten data was disaggregated to allow comparisons against the national normative trends to be made. Year level disaggregation was necessary as the national norms differ at each year level.

4.2.1.1 Year Nine Data

A means analysis of the Year Nine (*n*=21) data suggests that significant growth was achieved by this sample of students as a result of the intervention in comparison to the national normative growth of Year Nine. This information is summarised in Table 2 below.

Table 2.

Year Nine Means Analysis of e-asTTle data

	Pre-test		Post-test	
Group	*M*	*SD*	*M*	*SD*
National Norm (Terms 1-2)	1497		1499	
National Norm (Terms 1-4)	1497		1519	
Intervention Group	1385	62.85	1441	52.09

The average shift in achievement by this class equated to 56 raw score points. The e-asTTle Norm Tables (Ministry of Education, 2010) suggest that normative progress for Year Nine students between Terms One and Two equates to two raw score points. Over the course of one year, students are only expected to increase their achievement by 22 raw score points. Therefore, these results suggest that this group of Year Nine students have achieved statistically significant growth as a result of the intervention. The significance of this growth suggests that the Year Nine group, whilst still behind national norms, were beginning to 'catch-up' to their normally developing peers. This growth is demonstrated in Figure 1 below.

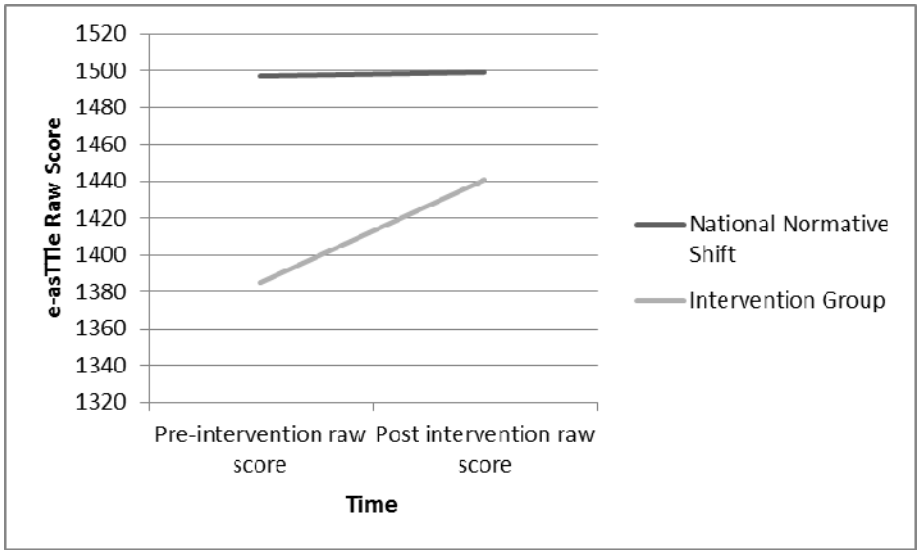

Figure 1. Year Nine e-asTTle Average Raw Score Shift in Comparison to National Normative Shifts

4.2.1.2 Year Ten Data

The means analysis of the Year Ten data (*n*=10), summarised in Table 3 below, suggests that some progress was made by this small sample of students.

Table 3.

Year Ten Means Analysis of e-asTTle data

	Pre-test		Post-test	
Group	*M*	*SD*	*M*	*SD*
National Norm (Terms 1 -2)	1529		1539	
National Norm (Terms 1-4)	1529		1567	
Intervention Group	1442	48.46	1461	64.69

The average shift in achievement by this class equated to 19 raw score points which is almost double the average normative shift of 10 raw score points during the first term (Ministry of Education, 2010). Whilst the Year Nine data showed significant gains on their normative levels, the Year Ten data shows more modest gains towards equalling the national norms. This trend is demonstrated in Figure 2 below.

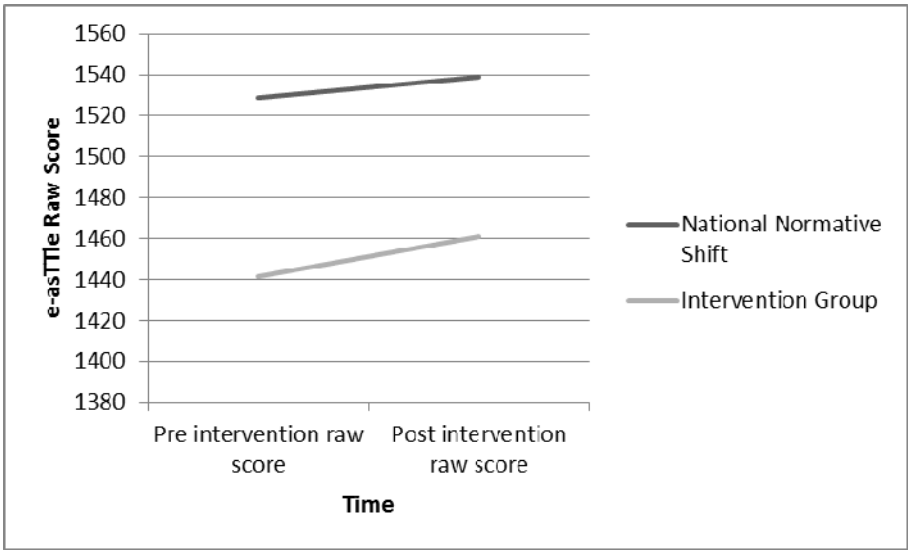

Figure 2. Year Ten e-asTTle Average Raw Score Shift in Comparison to National Normative Shifts

4.3 Case studies

Four consenting participants were selected for case study analysis. Each is described independently but also within two broad categories; examples of statistically significant comprehension growth in relation to the national norms and examples of insignificant growth in relation to the national norms. No consenting participants' scores showed regression, therefore, these case studies were unable to examine the causes of deterioration.

4.3.1 Examples of significant growth in e-asTTle raw score

Of the two examples of significant growth in the e-asTTle raw score to be discussed, one was in Year Nine and one was in Year 10.

4.3.1.1 Case Study One

Case Study One (CS1) was a Year Ten New Zealand European student. As a result of the intervention, CS1's e-asTTle raw score increased from 1379 points to 1428 suggesting significant acceleration of his comprehension ability. CS1 achieved this increase despite consistently achieving critically below the expected reading standard during both Year Nine and Year 10. He had received some reading intervention as part of the school's normal response prior to the intervention but this did not make a difference to his e-asTTle scores. CS1 demonstrated extremely disruptive classroom behaviours as the following exchange, recorded during his first one to one training session, demonstrates;

CS1: [Silently reading then involves himself with other students' conversations] It'd be much quieter if you did [stop talking].
Teacher: That's inappropriate because at the moment we're trying to concentrate on this reading, OK?
CS1: [Starts whistling.]
Teacher: Don't whistle.
CS1: I don't like reading.
Teacher: That's alright. You don't have to like it but you do need to be good at it.
CS1: What for?
Teacher: Because everything in the world is about reading.
CS1: Nah, it's not.
Teacher: Actually it is. You don't want to get ripped off by someone getting you to sign a contract.
CS1: I know how to do maths though.
Teacher: That's fine, but you still need to have to read the contract.
CS1: I know how to read a contract.
Teacher: Yep.
CS1: I got one.
Teacher: I need you to do this.
CS1: [Student again starts to involve himself in classroom discussions.]
Teacher: At the moment, I'm really concentrating on you and how I can help you with your reading.

However, despite this, CS1 did seem to understand that his behaviour affected his learning and why improving his reading was important. In light of this understanding, he wanted to improve his achievement, as this exchange during his second think aloud illustrates;

Teacher: Do you think you give yourself enough of a chance to practise these [comprehension strategies] in class?
CS1: Nup.
Teacher: Why not?
CS1: Too busy pissing around.
Teacher: Why are you too busy pissing around?
CS1: …I dunno. Being stupid with my mates…
Teacher: Do you wish that you practised them more?
CS1: Dunno.
Teacher: Do you think you wanna get better at reading or…?
CS1: [Silence]
Teacher: Why do you think it's important to get better at reading?
CS1: 'Cause in life you don't struggle as much.

During the last two training sessions, CS1 was taken out of the classroom setting. In these sessions, he was quiet, attentive and worked hard as, by his own admission, he had "Got no

one to be silly with". This suggests that CS1's classroom behaviours were a learned behaviour perhaps developed as a defence against seeming intellectually inferior in front of his peers; he believed that if he was acting as the class clown, he could not possibly be thought of as stupid.

CS1's understanding of the consequences of his behaviour is further evidenced when, during his second training session, he was given the opportunity of another training session either before or after the post intervention e-asTTle test. He chose before the test. During this last training session CS1 also articulated his hope that he had improved his achievement levels;

Teacher:	So what are you going to do once you're in the test? Are you going to use those [comprehension] strategies?
CS1:	Yep.
Teacher:	Good. I'll look forward to seeing if you've improved.
CS1:	Hopefully.

These hopes were realised in his post intervention test scores. CS1 began the intervention with an e-asTTle raw score of 1379 points. By the end of the intervention, he had achieved an increase of 49 raw score points which, compared to national normative shifts, was statistically significant (Ministry of Education, 2010).

Part of the success in these results lies in the perseverance of the adult in the Zone of Proximal Development (ZPD) relationship. The teacher/researcher, in this case, had to see beyond some distracting and, at times, infuriating behaviour to keep CS1 focused on his reading comprehension. These trials are depicted in the excerpts above. In response to these challenges it was important that the teacher remained resolute in the belief that CS1 not only could do the strategies, but could actually improve his comprehension as a result of using them, thus giving the student no other option but to try. Thus in the face of comments such as "Look at my gumboot rash, Miss" and "There's four minutes and 22 seconds left [in the lesson]", the teacher needed to maintain that CS1 would need to "get to the end of the page" before he was done for the lesson. In addition, constant encouragement also helped to break through this barrier. So even for the simplest of questions, CS1 was told "Yep, good lad. That's a good question. I'm really impressed with that". Although the fight lessened over time, especially when CS1 was removed from class to complete his one on one training sessions, it never completely disappeared during the intervention's 10 week time frame as even at the end of the intervention, CS1 commented during a written reflection that the strategies he had learnt were "not useful because I hate reading".

Expectation and encouragement was also accompanied by detailed explanation of why the movement forward was good. For example, when talking about why there was no high school on the Chatham Islands during his reading of *Do You Live in a Grass Hut?* (Rainforth, 2009), CS1 was able to infer that the island did not have the population to support a high school by using his own knowledge as well as text based knowledge. As a result the student was told;

> Oh, that is a very good inference. That's really good. How do you know it's not a very big island? You just know that? [Student nods] So you know quite a bit about this and you made a link from what it says in here about there been no high school there to what you know about the Chatham Islands. That's a really skilled thing to do with reading.

This form of explanation was common throughout the training sessions as it not only reinforced what the student was doing well, but also helped to develop strategy knowledge by building up declarative and procedural knowledge of the strategies through constant reminders of this information.

The detailed explanations were an integral part of the intervention and especially the one to one think aloud training sessions. It was these sessions that allowed the student and teacher to work flexibly within the ZPD framework. Explanation, scaffolding, guided practice and, sometimes, independent use of strategies all took place during each training session. There was no set pattern for each of the stages of the ZPD and often, after independent strategy use, scaffolding, modelling and explanation would follow for exactly the same strategy. For example, despite giving a relatively insightful summary about why the character in the story was reluctant to leave the Chatham Islands for the New Zealand mainland, "Well, she didn't want to leave. Leave everything she had", after reading the next page of the story, CS1 struggled to summarise what he had read so a return to scaffolding and explanation was necessary, as this excerpt demonstrates;

Teacher:	Ok, what's happened in that part of the story?
CS1:	She said when she got there it was really quiet.
Teacher:	Where did she get to?
CS1:	Napier.
Teacher:	Ok, why was it so quiet?
CS1:	…None of them wanted to get in trouble.
Teacher:	Uh huh. What other reasons do you think?
CS1:	'Cause not many of them knew each other.
Teacher:	So are people quite quiet when they meet each other?
CS1:	Yep.

Teacher: How do you think they were feeling? All those people?
CS1: Shy.
Teacher: Shy, yeah. That's a good inference to make isn't it, 'cause you've taken your clues, you've combined that with what you know and you've come up with that. I think you've done a good summary.

At times, this scaffolding was more teacher-led and, at others, more student-led. The one to one training meant that the level of instruction and interaction was wholly responsive to the student's needs at that time. Sometimes this meant little more than prompting and feedback. At other times, this meant that the teacher relinquished control of the strategy use and forced the student to carry more of the load such as remembering what the questions were as opposed to being told what they were:

Teacher: Ok, so does that answer one of our questions?
CS1: Yep.
Teacher: Which one does it answer?
CS1: Um, what are they doing?
Teacher: Yep. Ok. So why is it important that the population is increasing or decreasing? Why should we care?
CS1: 'Cause there's not many of them left.
Teacher: Ok. Very good. Did that tell you in there? That there's not many left?
CS1: Nah, I just know it.
Teacher: So that's important to use what you know already to help you keep going. Read that bit.

But as this excerpt also demonstrates, strategy explanation and encouragement was never abandoned even when the student seemed to be able to act with some independence.

Despite the short nature of the intervention, there were even moments of spontaneous independent strategy use. This excerpt demonstrates use of spontaneous questioning by CS1 in response to a confusion that he had. Although he needed guidance to work out the answer, he had identified his confusion independently (highlighted by emboldened text below) and initiated the use of a strategy to help him comprehend what he was reading;

Teacher: What was that bit about?
CS1: Um… it says what they were doing? I dunno. It didn't say…oh Frederick … [reading] yeah, Frederick's. **Oh, is that the kiwi?**
Teacher: Do kiwis live in houses? [Referring to context clue "Frederick's home"]
CS1: Nup, burrows.
Teacher: Yep, ok it says "Frederick's home is in the middle of a kiwi breeding area". So who do you think Frederick might be?
CS1: That fella [points to the photo in story with two males in it].
Teacher: Which fella?

CS1: The old one.
Teacher: The old one? Hang on a minute, who's James Fraser?
CS1: The young one.
Teacher: But he owns the dogs and works for the Department of Conservation.
CS1: Oh no... James is the other one.
Teacher: So Frederick is who?
CS1: The young one.

The post-intervention e-asTTle test also demonstrated CS1's increasing ability to independently use the strategies. For example, when asked why people in an audience were "tut-tutting", CS1 was able to correctly infer that the audience was also annoyed at those eating sweets noisily during a theatre show which caused the performer to walk off-stage in protest, as opposed to demonstrating annoyance at the actor's response. These moments were rare but indicate a growing sense of usefulness and understanding of the target strategies. The comprehension strategy training supported this growth by allowing the adult to nurture the understanding and ensure a successful outcome further encouraging strategy use as a response to comprehension problems.

This movement to independence did not, however, occur without some intermediary steps. Although strategy use was evident during the very first think aloud session where CS1 asked many questions about the assigned text, *The Wind Singer* (Nicholson, 2000), these initial forays into strategy use were generally superficial as shown in this short exchange;

CS1: [Reading] Who's the lady?
Teacher: The "scarlet robed examiner"? So she is like an assistant examiner.
CS1: So she's like [the school's deputy principal]?
Teacher: Yeah.
CS1: Who's "ma'am"? [sounding out the word]

These low level questions provided an entry point to the text for CS1 where he could immediately begin to use the target strategies with some success. It is also important to note that at this stage in CS1's development, he was asking the questions of the teacher, as opposed to providing himself with a reason to read and find the answers by himself whilst reading the text. He chose to instead rely on the support of the adult in the ZPD relationship to support his comprehension. As CS1 became more confident in the use of strategies, he was able to begin to read to find the answers for himself indicating how a combination of strategy learning and the ZPD framework nurtured his comprehension development by building strategy knowledge and confidence in their use.

A part of what moved CS1 from the superficial use of the strategies to a more refined deployment was his increasing awareness of firstly the declarative and procedural knowledge of each strategy. This awareness developed slowly during the intervention. Over the course of the think aloud sessions, CS1 progressed from "No, I don't know what they are" statements in response to teacher questions about what text features were, to being able to parrot off some text features such as "commas, and full stops" and finally, being able to explain that an introductory paragraph in bold was intended to tell the reader "um, what the main thing's about." In his final reflection sheet, CS1 provided the following descriptions of what each strategy was used for;

Strategy	**What it is and why you do it**
Text fealurs [features] (sic)	So we can learn
Surmizing (sic)	We take out the main idea
Inferance (sic)	Looking at all of the clues
Questionng (sic)	We find questions and ancer [answer] them (sic)

Although not detailed in its description, this reflection sheet demonstrates an increasing independent knowledge base of what the strategies were and how they were supposed to support comprehension.

With this increased understanding came an increased use of the strategies. The most prevalent example again concerns the development of text feature usage. From simply barking out the random names of text features such as "title" or "pictures", CS1 was able to begin using text features to help him make inferences about the text. For example, when reading *A Scream in the Night* (Gibbison, 2007), CS1 used the photographs to help him infer that the story would be non-fiction in genre as well as correctly inferring that emboldened words were used to emphasise important information during his post-intervention e-asTTle test. It seems that the heightened awareness of declarative and procedural knowledge triggered the use of the strategy as CS1 began to understand not only what it was but why and how each strategy could be employed to aid comprehension.

Once the basic skills were mastered, the ZPD environment meant these fledgling skills were then gently nudged towards a higher plane of understanding. For example, when reading *Do You Live in a Grass Hut?* (Rainforth, 2009), CS1 demonstrated relatively sound inference skills such as when he explained the lack of a high school on the Chatham Islands (see above for

further discussion of this). But after the text had been read and he was prompted to think about what he should learn from reading this story, CS1 was unable to infer the theme of the story, a task that demanded much higher order inference skills than the previously mentioned undertaking. The following conversation ensued:

Teacher:	Ok, what do you reckon you're supposed to learn from reading this?
CS1:	[silence]
Teacher:	Ok, she loved living in the Chathams…here's my clues for you and you're going to have to work it out. She loved living in the Chathams but she had to leave. She was really scared about leaving and didn't want to. But once she got there, she really enjoyed it.
CS1:	…She didn't want to leave but then when she got there she realised she enjoyed it and it was really cool.
Teacher:	Yep, so what can you learn from this story for your life?
CS1:	…try new things?
Teacher:	Can you explain that a bit more for me?
CS1:	You can't just do the same old boring things, you've got to get out there and try stuff.
Teacher:	Yeah. What would be the benefit of getting out there and trying stuff?
CS1:	…meet more friends and that…
Teacher:	Have a good time, eh?
CS1:	Yeah.

So whilst CS1 was able to master lower level inferences to a relatively independent level, he needed further support to master higher level inference skills. This incident demonstrates how reading skills develop from the basic level to the advanced. As children develop their reading, the skills they encounter are not 'new', but rather more highly attuned to the more complex tasks they face and understandings they must make. The think aloud format encouraged the development of these skills to higher levels through the continuous nudging by the 'expert' in the relationship.

The crucial element in this strategy training was that the strategies forced CS1 to engage with the meaning of the text. He was forced to think about what he was reading as opposed to simply decoding the words off the page. This seemed to be a turning point for him. It happened only in brief flashes at first, for example, when he exclaimed "Shame! They're only in the Orange District. I'd be in none of them. I'd have my own district" in response to the plight of the Hath family in *The Wind Singer* (Nicholson, 2000) during his somewhat tumultuous first think aloud session. But with the powerful mechanism of the one to one think aloud training sessions which fostered increasingly active reading, CS1 was able to read for longer periods and discuss what he was reading about at greater length. Furthermore, he

began to look to the text for answers and evidence to support his assertions as is shown in this excerpt:

Teacher:	Ok, read this little bit in bold here. What information can you get out of there?
CS1:	[reads] Um, what the main thing's about.
Teacher:	Ok, what's it about?
CS1:	[reads] She… she went to Napier for her boarding school.
Teacher:	Who's she?
CS1:	[reads] Tamsin Penny.

For CS1, the mixture of encouragement, modelling, explanation and guided practice meant that his comprehension development was accelerated to the extent that he finally began the long journey to catch up to his peers. The line of development that CS1 followed is also evident in the developmental pathway of the second case study.

4.3.1.2 Case Study Two

Case Study Two (CS2) was a female Year Nine student. At the beginning of the intervention, her e-asTTle raw score was 1392. After the ten week intervention period, CS2's results rose by 36 raw score points to 1428 which suggests significant acceleration of her comprehension achievement.

CS2 did not present the same behavioural challenges as CS1. Instead the lack of confidence in her reading ability was more honest and obvious. Discussions during her think aloud training sessions were heavily populated with the word "um", long pauses and uncertain answers framed as questions. This excerpt, from her second think aloud session, demonstrates her uncertainty during a discussion about the four targeted comprehension strategies:

Teacher:	... Can you remember what four comprehension strategies we have been working on?
CS2:	Um… is it... um…text features, inference…
Teacher:	Yep.
CS2:	Oh, is that one?
Teacher:	Yep, what else can you think of?
CS2:	Is it questioning, one?
Teacher:	Yep.
CS2:	And um…
Teacher:	Summarising?
CS2:	Oh, yep that's right.

Subsequently, as with CS1, the adult in the ZPD relationship became crucial to CS2's success as they provided her with reassurance and confidence. This encouragement was central in the development of successful strategy use and CS2's reading comprehension confidence. So reassurances of the fact that she was "brainy" when she questioned her own ability, and scaffolding her use of the strategies to build her confidence were important aspects of the training as this passage, based on a reading of *Invisible Boy* (Friend, 2007), demonstrates:

Teacher:	Do you think we can answer that here? [Who is the "Invisible Boy" mentioned in the title of the story?]
CS2:	[Silence]
Teacher:	I want you to look for the words "invisible" boy in this first section.
CS2:	[re reads] Um, is there any? Is there any? Nah, there's not eh? Is there any? [Teacher nods] Oh, I, um, going to have to… I can't see it.
Teacher:	Take your time. Don't stress.
CS2:	[Re reading] Oh yep, I've found it, I've found it.
Teacher:	Ok, so what does that sentence with those words in it say?
CS2:	It says, "she's the most popular kid in the class," um, "even with the teachers. Me, I'm the invisible boy."
Teacher:	So, let's go back to that question, who's the invisible boy?
CS2:	….um….him…nah [laughing].
Teacher:	How do you know it's him?
CS2:	'Cause he's the one telling the story?
Teacher:	Good girl. Ok. That's perfect….

The reassurance given to CS2 was not that different from the encouragement given to CS1. Both students felt uncertain about their reading comprehension abilities and although both students exhibited these feelings in very different ways, they both benefitted from the adult-student, or expert-novice, relationship. The think aloud sessions created an environment which built confidence and consequently, seemed to be highly conducive to successful strategy training.

Just as with CS1, CS2's understanding of the target comprehension strategies began with teacher modelling and explanations that were dispersed throughout the think aloud sessions. For example, in the first think aloud session, the student was given questions to think about during her reading of *Boy Overboard* (Gleitzman, 2002) by the teacher. These were framed to model how an expert reader thinks during the reading experience:

Teacher:	So I wonder, you know, I wonder if Jamal is going to get his ball back? 'Cause that is like his favourite thing in the whole world, eh? And it was Yusuf's ball so he's got to get it, eh? Shall we read the next page?

As with CS1, such modelling, and the associated explanation that often went with it, led firstly to a superficial understanding of the target strategies by CS2. She was able, from relatively early in the intervention, to recite the names of the strategies and some text features. But she lacked the deep understanding of these strategies to really aid her comprehension until it was fostered by the teacher scaffolding as shown in this passage from her first think aloud session;

CS2:	What are those called again? [points at an apostrophe in the text]
Teacher:	That's an apostrophe. Do you remember what an apostrophe is for?
CS2:	Yep, when you like stick two words together or something?
Teacher:	Uh huh.
CS2:	Yeah.
Teacher:	What happens when it is an apostrophe s though? 'Cause that's something special.
CS2:	Um… well that's like adding an, like, an s? Nah… I dunno.
Teacher:	I'll give you a clue, [CS2]'s shoes.
CS2:	Um…
Teacher:	So apostrophe s means that you own it, eh?
CS2:	Yep.

This excerpt also shows that the one to one training sessions allowed the teacher to continually assess the student's knowledge and then build onto what they already knew. By adding to the student's existing knowledge framework, the strategy training became less about the addition of new knowledge, but rather the refinement and expansion of existing knowledge through a mixture of scaffolding and direct explanation as this extract demonstrates:

Teacher:	Can you tell me about wondering, and asking yourself questions? What we've been working on for the last couple of weeks. Can you remember what that is?
CS2:	Um, yeah. We have to ask ourselves questions when we read.
Teacher:	Uh huh. What sort of questions do you have to ask yourself?
CS2:	Like before you say, 'ohhh, what is, what's this book about?' And when you like read it…
Teacher:	Uh huh.
CS2:	You're like some…oh….um…
Teacher:	Am I understanding this?
CS2:	YEAH, that!
Teacher:	What's going on here?
CS2:	Yeah.
Teacher:	I wonder why this character's doing that? I wonder why I should be reading this at all? Do you ever ask yourself that? Why does Miss want us to read this?
CS2:	[Silence]

Teacher: Why do you think it's important that you ask yourself questions?
CS2: Um, so that you know.
Teacher: What do you mean so that you know? What should you know?
CS2: Um… what the characters…who the characters are and stuff. And what their purpose in the story are.
Teacher: Yeah. Very good.

By adding to the existing knowledge base in this way, the student was able to move to more independent strategy usage. An example of this was when she was reading *Boy Overboard* (Gleitzman, 2002). She exclaimed in the middle of a period of silent reading "Eh? What the hell? Who makes tents out of clothes?" in response to reading about the state of a refugee camp in which the characters were staying at that point. With further guidance, CS2 was also able to start to see the importance of not only asking questions but finding their answers as well as this passage from the same think aloud illustrates:

Teacher: Ok, what questions have you got, love?
CS2: Um… questions? I've got answers.
Teacher: Ok, what answers have you got?
CS2: Well, you know on the other one? Um, um, she's, the man, ohhh, the boy, wait, who's the main boy?
Teacher: Jamal.
CS2: Well, he thinks people [who are laying in the refugee camp moaning] are sick, but they're not, they're just hungry.

This passage also starts to demonstrate how the strategy training was able to move CS2's development forwards: she was forced into greater engagement with the text. She was forced to really start to think about what it was she was reading. This development began with small exclamations of "Oh, my gosh. This is so funny!" in the middle of silent reading and evolved to her rereading the text to find answers to the teacher's questions. At the beginning of her second think aloud session (at the end of the intervention), CS2 was able to pinpoint the purpose of the strategies, if somewhat accidentally, when she stated "Um, thinking" in response to being asked to name which comprehension strategies the class had been focusing on.

CS2's think aloud transcripts were also able to reveal more of the way in which the teacher scaffolding functioned within the think aloud sessions to foster the comprehension development. For example, the transcripts revealed how the scaffolding worked to build CS2's confidence by forming a carefully judged safety net. When CS2 had questions, was unable to move forward, or went off-track, the think aloud training sessions meant that she was provided with immediate answers, immediate guidance and immediate error correction. For

example, in a discussion about text features, the adult in the relationship was able to fill in the gaps in CS2's knowledge base:

CS2:	Ok, there's one [pointing out a text feature].
Teacher:	What is that one?
CS2:	That is called a……
Teacher:	Comma?
CS2:	Yep, that's right, comma.

CS2 was given a chance to identify the text feature that she had found and the long pause indicated to the adult that the name of the text feature was a gap in CS2's learning. The environment of the one to one think aloud training session meant that gap could be filled quickly and without fuss in a way that independent classwork or even perhaps group work, simply could never do. The student evidently felt safe to expose her lack of knowledge, an important step to filling those gaps in.

The one to one sessions worked to not only identify gaps in the student's knowledge base but also allowed small comprehension misunderstandings to be quickly identified and fixed before they snowballed. In this extract, CS2 has been asked to summarise what she has read so far in the story, *Invisible Boy* (Friend, 2007):

Teacher:	Why does she get so spoilt?
CS2:	'Cause she looks like, um, 'cause she looks like, um, and her mum and um, what is it? And, um, her dad always spoils her 'cause she looks like her mum, I mean.
Teacher:	But I look like my mum and I don't get spoilt.
CS2:	[Laughing]
Teacher:	What happened to the mum?
CS2:	She die… oh that's right, she died, six years ago.
Teacher:	So how do you think the dad feels?
CS2:	Sad.
Teacher:	Is that the reason he is spoiling Debra, do you think?
CS2:	Um, yep.

What CS2 failed to infer independently was that the sister was spoilt by her father because of her physical resemblance to her late mother as well as the father's grief at losing the mother. The highly responsive teacher scaffolding, facilitated by the one to one training sessions, meant that this important inference which was initially missed was immediately identified by the adult and then scaffolded to encourage the student to gain a greater understanding of the story.

The one to one training sessions afforded a lot of flexibility to the teaching and learning relationship. It was not only the target comprehension strategies of inference, identifying text features, summarising and questioning that were worked on during the think aloud sessions. For example, an unfamiliar word came up during the *Invisible Boy* (Friend, 2007) reading which CS2 thought she was unable to decode. The environment fostered by the think aloud sessions meant that she was scaffolded through a decoding strategy so that she could successfully sound out the word:

CS2:	Yep, and the dad asked the girl, her name's Debra, what this …um… I can't even say the word… this?
Teacher:	See if you can sound it out.
CS2:	Is it, is it car?
Teacher:	Why do you think it's car? 'Cause there's no r there.
CS2:	Oh.
Teacher:	What's those first three letters spell?
CS2:	Oh, cat [laughing].
Teacher:	Yep. And then, how could you… what do those last four letters spell?
CS2:	Um, leon?
Teacher:	Yep.
CS2:	Cataleon?
Teacher:	Yep, I reckon. Cateleon. Cateleon.
CS2:	Cateleon.
Teacher:	Yeah.

Later on in the reading, when cateleon was again encountered and CS2 stated that she "can't say the word", she was instructed to "Try" and used the same strategy to again successfully decode the word. Thus the ZPD relationship fostered in the think aloud sessions meant that authentic learning in response to real problems encountered by the student was able to take place. The adult in the relationship was able to take advantage of the 'teachable moment' when a gap was identified because of the environment in which the student felt safe to expose their weaknesses.

CS2's transcripts show us that she followed the same sort of developmental trajectory as CS1. It was a result of the explanation and modelling, followed by the guided practice and eventual release of control to the student that enabled her to overcome some confidence issues and achieve significant progress. As with CS1, CS2 also reveals that the strategy use forced her into engaging with the text and this seems to be the crucial element which moved the student's achievement forward. But what is perhaps most interesting about CS2's transcripts is how they reveal that the expert is continually assessing a student's knowledge and building upon what students already know during the one to one training sessions. The sessions meant that the

researcher/teacher was able to simultaneously support and gently challenge a student's progress.

4.3.2 Examples of insignificant growth in e-asTTle raw score

Of the two case studies of insignificant growth in the e-asTTle data, both were female. One was Year Nine and one was Year Ten. The discussions below will explore the differences and similarities of these two case studies in comparison to the first two.

4.3.2.1 Case Study Three

Case Study Three (CS3) was a Year Nine female who had an eager-to-please disposition. Whilst chatty, she did not present challenging classroom behaviours and always completed set work to the best of her ability. However, despite wanting to improve her reading achievement, she did not display the same accelerated growth that CS1 and CS2 demonstrated. CS3 moved 16 raw score points from 1394 to 1410. This was above the normative growth of two raw score points for Year Nines during term one, but well below the class movement average of 56 raw score points.

The cause of this difference for CS3 was hard to explain because on the surface, she seemed to follow the same developmental pattern as the CS1 and CS2. She followed the same modelling and explanation pattern and bought into strategy use early in her training sessions as this excerpt from her first session, using *Boy Overboard* (Gleitzman, 2002), shows:

CS3:	[Reading]
Teacher:	Do you know a question that I had in my head as I was reading this bit was why did their house explode?
CS3:	Oh, yeah. I was just looking at that.

CS3 saw the importance of the strategies that were explained and modelled for her and attempted to put them into immediate usage by agreeing with the teacher that thinking about the differing elements of the text was actually important.

Refinement of the initial superficial engagement with the texts and strategy use soon began to develop as a result of the ZPD relationship that the training sessions fostered, as this extract, also from the first training session, demonstrates:

CS3:	[Reading]
CS3:	Mum, is getting ready I think. 'Cause it says…oh the dad says, "Mum wants to go to the city. She'll meet us there tomorrow."
Teacher:	Yep. So, she's gone to the city? Do you think she's safe there? 'Cause

I wonder if she's safe. 'Cause it says "Dad takes a deep breath", like he's trying to think what he's saying, like it's not an answer that he's thinking immediately, eh?

CS3: Yep.

Teacher: Hmmmm.

CS3: [Reading] His mum… oh the dad … oh the mum wants the dad to take her somewhere safe.

Teacher: Yep. Oh, take the mum somewhere safe? 'Cause I read that "Mum wants me to take *you*" as in Jamal and Bibi. Jamal and Bibi, eh? But that's a good question 'cause that leads you to think, am I checking what I'm reading, 'cause that's a really important thing to do. [Emphasis added by the speaker]

By gently questioning the student's summary, which contained some errors in understanding, the teacher was able to guide CS3 towards a better understanding as well as encourage the development of the student's monitoring skills. These types of interactions recurred throughout all of CS3's training sessions as, like CS1 and CS2, she required the same strategies to be explained, modelled and trialled several times before she began to grasp their correct usage. It was this type of interaction that meant that CS3's comprehension skills grew in much the same fashion as CS1 and CS2.

With regular coaching as well as increased challenge and refinement of her skill base, CS3 was able to engage with texts on a deeper level and more independently. For example, she spontaneously asked why Jamal's father was shushing everyone whilst engaged in reading *Boy Overboard* (Gleitzman, 2002) during her first training session. In her third training session, CS3 demonstrated that she was increasingly able to monitor her own understanding of the text and deploy strategies to mend her understanding independently when reading an article about Anthony Kiedis, the lead vocalist of the Red Hot Chilli Peppers (Frances, 2008);

CS3: Why does it say … um… why does it say 'he grew up in a poor family and his dad was a drug dealer'? Oh…now I get it.

Teacher: Why didn't you get it before?

CS3: 'Cause I thought the dad was a drug addict and dealer.

Teacher: Well, he was a drug dealer, wasn't he?

CS3: Yep.

Teacher: And there was a period where he was heavily addicted. So that's quite confusing, isn't it? 'Cause it has a he and it talks about his dad, but you've got to think the main idea, what's the main idea here? Anthony Kiedis' drug dealing dad or Anthony Kiedis?

CS3: Anthony.

Teacher: Yep, so you've gotta work it out with the clues and you've gotta take all these little, what are called pronouns, like he and I, and work it all out.

There was also evidence of CS3's increasingly independent use of the strategies and increased text engagement in her independently completed classwork. When reading *The 2007 Guinness Book of World Records* (Glenday, 2006), she recorded her questions such as "I wonder if 1,1015 Piersing [piercing] hurt" (sic) and "Why do people do these slilly thing's that could put there life in derange [danger]" (sic). Her summaries based on the same text demonstrated a relatively high degree of synthesis by surmising that this book was about "…magnifisant people doing crazy things" (sic). Further evidence of her ability to engage the strategies independently was also apparent in her post-intervention e-asTTle test where she was able to correctly infer the answers for questions such as "In paragraph 5 of *The Challenger* why does Angela forget what she is supposed to do first?" with answers such as "She is nervous about competing in the championship."

Considering that CS3 adopted the use of the strategies easily, did not pose any behavioural problems and was committed to ensuring that she improved her reading, it is difficult to understand why she was unable to achieve the same rate of growth as her peers. It was late into her third and final training session that the reason became apparent. It seems that CS3 had difficulty with decoding multisyllabic words and it is this issue that appears to have posed a considerable obstacle to her comprehension development:

CS3: Hmmm, what's that say?
Teacher: Well, sound it out.
CS3: Hero –is-m.
Teacher: Put it altogether.
CS3: Heroism. [laughs] I don't know.
Teacher: Heroism.
CS3: Oh. [laughs]
Teacher: Those little bits on the end of words really throw you, eh?
CS3: Yeah.
Teacher: So what you've got to do is look at the beginning of the word, like hero. 'Cause you've got that down and that's pretty easy and then figure out this part of the word. Think about where else you might have seen –ism. So…fascism, is probably not a good example. Heroism, communism, comedianism, oh I don't know, I don't even think that's a word.
CS3: [Laughs]
Teacher: So heroism is…
CS3: A quality…is it?

Teacher: Uh huh. What does G-E-N sound like?
CS3: Gen.
Teacher: What does E-R sound like?
CS3: Er.
Teacher: What does O-S sound like?
CS3: Os.
Teacher: What's I-T-Y?
CS3: Ity?
Teacher: Yeah, so put all those together.
CS3: Gen-er-os-ity, generosss… [laughs]
Teacher: So sound it out carefully.
CS3: I know it.
Teacher: I know you know it.
CS3: Is – os, oh!!! [laughs]
Teacher: Gen-er-os-ity, so put it all together.
CS3: Gen-er-osolo… [laughs]
Teacher: Gen-er-os-ity.
CS3: Yeah! Generosity!

So while, generally able to understand spoken words, CS3 found it difficult to access their orthographic representations, especially when confronted with the types of multisyllabic words that were increasingly common in her class texts. Upon further investigation, it also became apparent that she read, albeit in a mumbling fashion, aloud to herself during the first think aloud despite being instructed to read silently. This also suggests that she had not yet automatized her decoding skill. The deficiencies in her decoding skill stopped her from accessing the meanings of the words that she knew aurally. It is suggested that this is the reason why, despite following the same comprehension trajectory as her peers, she was not able to achieve the same level of growth as they did. Decoding matters and without solid decoding skills, CS3 was unable to access the higher levels of comprehension that her peers were able to.

4.3.2.2 Case Study Four

Case Study Four (CS4) was a female Year 10 student. She was another student who did not achieve the same growth as her peers. The e-asTTle results suggest that very little difference was made to CS4's achievement as a result of the intervention with a statistically insignificant movement of six raw score points from 1461 to 1467. This was below the 10 raw score point normative shift of Year 10 students during term one.

Whilst she did not display overtly negative behaviour, CS4 could be challenging to get to work and she often did not hand in her work. She seemed uninterested in pursuing deeper

understandings of the texts she was required to read. She recorded that, despite feeling that she was a good reader she did not like reading and was unlikely to read in her spare time in the attitude questions at the beginning of her e-asTTle test. CS4's lack of progression was perhaps a result of her negative attitude towards reading which put up somewhat of a block towards working effectively within her ZPD. It is possible that, because she felt she was a good reader (the opposite view of CS1), she was unable to see the benefits of learning the strategies and applying them to text. In other words, she was unmotivated to try, whereas CS1 was at least able to see the benefit of improving his reading skill even if he did hate it. The transcripts of CS4's training sessions demonstrate the relative lack of CS4's co-operation during the intervention:

Teacher:	What's that comprehension strategy that we've been using?
CS4:	Nah … umm…. finding things like commas and stuff.
Teacher:	Finding commas and stuff. Do you remember that's called looking for text features?
CS4:	Yep.
Teacher:	Yep, why is it important, do you think, that I'm getting you to find those things in anything you read?
CS4:	Um, ah, so I'll be a better reader?
Teacher:	Yep, but how does it make you a better reader?
CS4:	Ah…pass.

So whilst CS4 was able to regurgitate the class rhetoric about becoming better readers, it is questionable whether she thought this applied to her own reading as she often resorted to short sentences such as "ahhh…nooooo" when asked if, for example, she had identified any text features. This seeming lack of interaction made teaching within CS4's ZPD difficult as judging her true level of understanding was problematic.

CS4's lack of buy-in into the intervention and the interactive nature of the training sessions led to, in the second training session, the teacher carrying the load of comprehension for CS4. Consequently, the teacher crossed the fine line between modelling and doing the work for the student, as this excerpt shows:

Teacher:	I'm going to stop you 'cause you're at the start of p84. Can you just have a quick look over [p. 84] and see if there's any text features?
CS4:	Um……. Exclamation mark…
Teacher:	Yep, exclamation mark. What do exclamation marks show us?
CS4:	That … they're talking?
Teacher:	Exclamation marks show that someone is shouting or speaking quite loudly. We've also got …can you see this stuff here?

CS4: Yep.

Teacher: Why is that different?

CS4: Um... because... they're talking.

Teacher: Do you know what that text feature is called?

CS4: [Shakes head] Nooo.

Teacher: Remember that's called italics? So that writing on the side does show us that they're talking, but they're doing a special type of talking aren't they? Are they talking out loud or...?

CS4: Um…they…

Teacher: What do you think they might be doing?

CS4: …Um…they…

Teacher: Do remember last year when we read *Under the Mountain* [Gee, 2009] and the twins were able to pebble to each other?

CS4: Um…yep?

Teacher: That is what they're doing, pebbling, or otherwise known as talking telepathically. They can send their thoughts to each other. So when we have, in this book, the italics, it shows us that they're talking telepathically, ok? Have you thought of any questions about this book?

CS4: Um…

Teacher: One of the questions I thought was what happens, because Kestrel is taking quite a big risk going back to see her family here isn't she? Um, what happens if they catch her? And will she be caught? And, by asking myself that question, it makes me think I want to keep reading to see if I can find out the answer to that, ok?

The "ums", "ahhhs" and extended silences demonstrated in this extract provided a smokescreen for CS4 to hide behind as the teacher interpreted these as signals of needing help rather than a tactical withdraw from the activity. By doing the work for the student, this training session did not move within the student's ZPD and, consequently, she learnt very little from it. The lesson from this training session is that it is important that the teacher monitors their own level of interaction and forces the student into more of the action when they are overly reliant on the teacher's help. This shows that there is an incredibly fine line between helping the student to understand through modelling and taking over and this must be judged on a case by case basis.

By the third training session, the teacher had realised that CS4 had participated very little in the second training session. A change in the teaching forced CS4 to engage with the text more, even though it did make for some uncomfortably long silences during the session as this extract demonstrates:

Teacher: We're going to ask some questions. Two of the questions are how is this text similar to others that I have read? And what am I supposed to

	learn by reading this text? I need you to come up with two other questions.
CS4:	[Silence]
CS4:	Is… [silence] …um…why are people driving drunk?
Teacher:	Do you think that's going to be a good question?
CS4:	Nah…
Teacher:	Why not?
CS4:	Um…I dunno…
Teacher:	Well, what's this about?
CS4:	How to stop drunk driving.
Teacher:	So, do you think that's going to explain why people drink drive?
CS4:	No… [silence]
Teacher:	So what's another question we could ask?
CS4:	Um… how do you stop drunk driving?
Teacher:	Marvellous… love that question. Got a pencil? Pen? Write that down as number one. Why is that such a good question?
CS4:	Because it's what it's about.

By the teacher persevering through the silences, which in previous training sessions were filled in, CS4 was forced to think about and interact with the text. This allowed the training session to increasingly work within CS4's ZPD and allowed the teacher to refine CS4's strategy use by guiding her thinking about questions with questions that gently challenged that thinking to higher levels. The silences not only forced CS4 into interacting with the text but it also crucially gave her the thinking time to do so. Consequently the message from CS4's experience is that the adult has to be careful during one to one training sessions. They cannot assume that a student's silence means they have reached an impasse, and then step in. The adult needs to carefully judge this and, at times, force the student out of their silences by simply waiting for them to think.

Once the barrier created by CS4's silences and short "no" answers was broken, she began to increasingly use the strategies relatively independently and quickly as this excerpt from her third training session demonstrates:

CS4:	[Extended silent reading]
CS4:	Um…just says stuff about designated drivers.
Teacher:	Uh huh. Is there anything about… what was our inference? 'Designated drivers are safer than drinking under the limit'. So, what does it… have a look at that second bullet point down.
CS4:	It says "the designated driver approach helps driving and that, um, because, that person doesn't drink alcohol, it doesn't require a driver or a passenger to drive" [somewhat indecipherable but is reading off the text].
Teacher:	So does that prove that inference?

CS4: Ah, yeah?
Teacher: How?
CS4: Because, they're talking about the designated driver and how he doesn't give into the alcohol.

This passage demonstrates that both the teacher and the student were beginning to work together to progress CS4's comprehension skills. By supporting and questioning CS4's responses, the teacher was able to guide CS4's thinking to higher levels. It is this type of interaction which finally saw CS4 start to grow her comprehension in the same way as the other students. However, the change probably began too late for this to have an impact on her e-asTTle data. Given more time, it could be hypothesised that CS4's growth trajectory would imitate that of her class mates.

4.4 Summary

The e-asTTle results suggest that the metacognitive comprehension strategies training had a significant effect on the comprehension achievement of this group of students. Disaggregation of Year Nine and Ten data show clear and significant gains on the testing tool's national normative data by the Year Nines and more modest gains by the Year Ten group. Case studies were able to identify some key factors which can go some way in explaining why some students were able to accelerate their learning and others were not.

For those students who did accelerate their learning, the clear and explicit explanation of strategies gave them insight into what good readers do when they read and an access point into effective reading. The one to one training sessions afforded the teacher the opportunity to tailor instruction to student needs that was able to overcome severe behavioural and confidence issues as well as immediately righting any student misunderstandings and refining student knowledge and use of the target strategies which culminated in students increasingly using the strategies independently.

Factors which significantly impeded the ability of the intervention to accelerate the comprehension learning of students included attitudinal barriers which meant students did not see the value in using the strategies. This barrier took some time to break down, and although there was some success in doing this by the end of the intervention, the shift in values had happened too late to affect e-asTTle scores. Another salient factor which negated the effect of the comprehension training was the lack of advanced decoding skills in some students. Without high level automatic decoding skills, these students struggled to improve their

comprehension processes simply because they were distracted by their laboured word decoding.

Chapter Five Discussion

5.1 Introduction

The quantitative results revealed that significant acceleration of student comprehension was accomplished as a result of the intervention. There were several important factors which served to facilitate this acceleration. Of primary importance, the metacognitive strategies students learnt transformed them into active readers who engaged with texts as opposed to merely passively decoding them. The strategies served as an entry point into active text engagement and, as students began to see the benefits of using them, the strategies became generative and self-sustaining. Important cognitive developments associated with early adolescence meant that this group of students was better able to understand the metacognitive elements of the strategies which underpinned their use. This understanding was generated through explicit and systematic instruction which was guided by information revealed during student think alouds. The student think alouds also provided a way in which to work in each student's ZPD which was crucial in accelerating their progress. Two important factors were found to negate the acceleration of the intervention. Principally, decoding issues meant that some students did not possess the pre-requisite skill set that would otherwise have enabled them to accelerate their comprehension. Furthermore, some students' attitudinal issues, which took some time for the teacher to overcome, delayed the effects of the intervention.

5.2 The Extent of the Acceleration

The quantitative results of this intervention were unexpectedly significant. Despite hypothesising that teaching metacognitive comprehension strategies within a ZPD framework would be beneficial to this particular group of struggling readers, it was not expected that many students would accelerate their learning by double the average normative shift for one year during a mere 10 week intervention. This relative shift in movement, from where students were to where they ended up is especially significant as they began to accelerate their learning after years of apparent minimal growth or stagnation (Vygotsky, 2011). Although these struggling students had not caught up to their normally developing peers' achievement by the end of the intervention, their trajectory suggested that they would soon achieve the normative achievement. This was particularly true of the Year Nine group whose trajectory suggested that they would equal the national norm after maybe another five to ten weeks of

instruction. The statistical significance of these results suggests that teaching metacognitive comprehension strategies within an intensive ZPD framework (intensive in that it is primarily teacher-led), provides a possible strategy to bring up New Zealand's achievement tail and close the gap (Marshall et al., 2008; Telford & May, 2010).

The relative ease of the statistical movement as a result of this intervention also suggests something of the nature of the underachievement problem. The Response to Intervention framework (RTI), that is more commonly associated with dyslexia, provides some insight (Tunmer & Greaney, 2010). One of the key elements of the RTI framework is that it measures student achievement in response to firstly, well designed, scientifically-based, whole class teaching interventions. If students fail to respond to this low level intervention, RTI then increases the intensity of intervention through students working more closely with teachers more regularly firstly in small groups and then one on one (Fuchs & Fuchs, 2006). What an RTI framework seeks to do is eliminate deficient instructional and environmental factors as a cause of reading underachievement in that if a child responds relatively quickly to the less intensive intervention, the cause of their struggle is more likely to be environmental rather than a harder to remediate intrinsic cause such as language deficits (Tunmer & Chapman, 1996; Tunmer & Greaney, 2010; Vellutino et al., 1996). The extent of the shifts in achievement in this cohort of students suggests that they had perhaps received little or no comprehension instruction or, that the students' lower socio economic status meant that they were unlikely to have received the enriching literacy experiences at home which would have prepared them to discover the comprehension strategies independently (Kamhi & Catts, 2012; Vellutino, Fletcher, Snowling, & Scanlon, 2004). Consequently, even this small amount of explicit and intensive comprehension instruction was able to significantly move their e-asTTle achievement scores (Kamhi & Catts, 2012).

5.3 Factors of Acceleration

Several factors supported the acceleration of comprehension achievement. Primarily, it was the transformation of students from passive decoders to active comprehenders through the use of the strategies that good readers employ. The metacognitive element of the training facilitated this change as the students were suddenly aware of what effective comprehension was and how to do it. This understanding was developed through explicit instruction from the teacher and student think alouds which enabled the acceleration of comprehension learning because this meant that the intervention was working in students' ZPDs.

5.3.1 Transformation into Active Readers

For students who did achieve significant progress, the crux of the intervention which accelerated their progress was the transformation from passive decoding of words to active engagement with the text and its many possible meanings (Jackson & Cooper, 2007; Pressley & Hilden, 2006). Suddenly, these students were thinking about their reading in the same way Tatum's (2008) work with struggling inner-city African American adolescent boys were. They had somewhat of a metacognitive epiphany where they suddenly realised they had to think about their reading. The strategies gave them an entry point into this thinking and they were able to begin monitoring their comprehension and employing fix up strategies when they identified meaning had broken down (Pressley & Afflerbach, 1995). Although the monitoring and fixing up was not always consistent and not always independent, the beginnings of this comprehension monitoring and the use of the comprehension strategies showed that, for the first time, these students realised that they were actually meant to construct meaning when reading the page.

Once the students understood that they were expected to think about the reading, they were much more focused on it and it became less of a battle for them to read for extended periods of time. The field notes of the researcher recorded that just four weeks into the intervention, a group of three Year Ten boys who had hated having to read in class commented that how, when they read previously, they had just read the words but had not done anything else; that they had not thought about what they read. The implication of this epiphany demonstrates how their reading habits had changed and was best demonstrated by this same group of boys who, for extended periods of time, were engaged with, as opposed to just 'reading', the assigned class text that they had earlier vocally declared 'boring'.

5.3.2 Good Reader Strategies

The entry point to active reading was the teaching of the strategies that the good reader uses. The comprehension strategies that the students learnt, taught them how to be a good reader in that they had to be persistent, reflective, flexible, and pay attention when they read, even in the face of texts they found unappealing (Gaskins, 2003; Jackson & Cooper, 2007; Pressley et al., 1994; Pressley & Hilden, 2006). The strategies gave them the means to become resilient readers. This was evident even with the most difficult students in the class who demonstrated the most disruptive behaviour in an attempt to avoid reading, being drawn into the text by the strategies. For example, CS1 commented "ha ha, shame, they live in Orange district" whilst reading the *Wind Singer* (Nicholson, 2000) and CS2 commented "Oh my gosh, this is so funny"

when reading *Boy Overboard* (Gleitzman, 2002). CS2's comment that the strategies she had been learning about were "Um, thinking" sums up the major change in students that this intervention created.

The comprehension strategies gave students the ability to get more out of the text which encouraged them to interact with the text more, again further developing their strategy use. Even those who took a little longer to see the benefits of the strategies, such as CS4, were eventually encouraged into engaging with the text. The target comprehension strategies that were taught provided students with supportive entry points into interacting with their texts, nurturing them to think about what they were reading (Bjorklund, 2005; McDevitt & Ormrod, 2002). They showed students how to be active as they read (Lewis & Jones, 2009; McDowall, 2010; Moje, 2008). Students suddenly realised that the key to successful reading was thinking.

5.3.3 Adolescent Cognitive Development and Metacognitive Understanding

Part of what made the strategy training successful was the increased metacognitive understanding students had of the strategies. In part, this is perhaps attributable to the cognitive developments which take place during early adolescence. The increase in the potential of the executive functioning skills of monitoring, detecting and correcting errors as well as heightened abilities to focus on reading and ignore distractions and increases in the size of working memory capacity intensified the potential for this metacognitive strategy intervention to begin to change the comprehension habits of the students involved (Anzures et al., 2011; Baker & Carter-Bell, 2009; Bjorklund, 2005; Byrnes, 2008; Falk-Ross & Hurst, 2009; Galotti, 2011; Goswami, 2008; Holler & Greene, 2010; McDevitt & Ormrod, 2002; Moses et al., 2005; Reeder et al., 2010; Towse & Cowan, 2005; van den Broek et al., 2009).

These early adolescents' cognitive developments suggest that this intervention was ideally timed to take advantage of these changes. Students' increased potential to think in the abstract about their reading meant they were more likely to be able think metacognitively in response to teacher inquiries into the how and why of their strategy use (Baker, 2002; Baker & Carter-Bell, 2009; Bjorklund, 2005). Conversations with students about their procedural, declarative and conditional knowledge of the strategies during the one to one training sessions, reminded students about this knowledge and, by extension, why the strategies were useful. Students' increased ability to understand the metacognitive foundations of strategies facilitated their successful use and encouraged their further practice. Students were asked to demonstrate their understanding of the importance of strategy use through questions such as

'why do you need to learn about this strategy?' during the one to one training sessions (Block et al., 2002). In response, CS1 knew that he needed to improve his reading as it was an important life skill and his e-asTTle scores rose significantly. CS4, on the other hand, already thought she had all the skills she needed to read successfully so did not engage with the strategy learning until the teacher could demonstrate to her that the strategies would benefit her reading correlating with statistically insignificant movement on her e-asTTle score.

5.3.4 The Importance of Explicit Instruction in Developing Metacognitive Understanding

Explicit instruction from the teacher seemed to be the pivotal key to transforming this group of struggling readers into active, 'good' readers. The nature of the teaching was explicit in that the metacognitive procedural, declarative and conditional knowledge of each of the strategies was clearly explained at the beginning of each strategy's two week target period and then continuously modelled and re-explained to students both in a whole class setting and during the one to one training sessions (Spear-Swerling, 2011). Its power is not clearly revealed through one to one training session transcripts but instead by the substantial shift of the e-asTTle data, especially by the Year Nine group. Many of these students only received one or two one to one training sessions, whereas all of them received explicit instruction in strategy use and saw the teacher model the use of each strategy during whole class teaching. This suggests that it was the explicit instruction, more so than the student think alouds which took place during the one to one coaching, which played the primary role in the development of active reading for this group of students. Furthermore, the Year Ten group, who had been taught strategies such as summarising in Year Nine by the researcher/teacher, but not in the same explicit manner, only managed to maintain their e-asTTle reading scores during their first year of secondary school. This intervention in their Year Ten year had far greater levels of explanation of what strategies were, how to do them and why to do them, resulting in more significant gains by the group than during their entire Year Nine year.

The significant effect of the explicit teaching on the students' achievement seemingly reflects Vygotsky's (1978, 1986, 2011) notion that children learn best when guided through complex cognitive tasks by an adult. Consequently, teacher modelling of the strategies played a significant role in supporting the explicit explanation of strategies as it showed students how to engage with texts. Modelling the thinking processes underlying comprehension is an important aspect of enhancing the potential comprehension achievement outcomes of the intervention (Anderson & Roit, 1993). The explicit instruction was successful because it

showed students how to apply the metacognitive aspects of how to react to texts; the what to think about, the how to think about it, the when to think about it, as well as the why to think about it, fostering their own abilities to do so (Baker & Carter-Bell, 2009; Bjorklund, 2005; Lewis & Jones, 2009; McDowall, 2010; Moje, 2008; Vygotsky, 1986; Wertsch, 1985). It exposed for students the implicit characteristics of successful reading that are not usually on show and that these students had failed to discover independently, demonstrating the need to be active readers (Alvermann & Eakle, 2003; Baker & Carter-Bell, 2009; Dole et al., 2009; Duffy, 2002; Falk-Ross & Hurst, 2009; Pressley & Afflerbach, 1995).

Consequently, as students began to understand what the good reader did, these struggling readers were increasingly able to move towards independent strategy use which also meant that their strategy growth became self-generative as their enhanced strategy understanding and usage led to further positive comprehension understanding (Stanovich, 1986). Many of these students had moved from the unaware level one metacognitive reader described by Kelley and Clausen (2007) to the level three reader who was aware of the mistakes in their comprehension construction and who used some fix up strategies independently, but more often with the support of the teacher. Given more time and guided practice, it could be strongly hypothesised that these same students would then become level four independent readers who used comprehension strategies automatically, expending little cognitive effort. The explicit nature of the intervention helped to show students that they were supposed to think about the texts that they read. It demonstrated that good readers read actively and how to do so (Vygotsky, 1978).

5.3.5 The Importance of Students Thinking Aloud

Through the medium of the think aloud, students were scaffolded by the teacher in their early attempts at strategy use and given multiple opportunities to practise them with immediate expert feedback available (Byrnes, 2008). The students' think alouds were vitally important as they meant that the reading process was opened up and, therefore, mistakes identified and remedied (Gallimore & Tharp, 1990; Vygotsky, 1978, 1986, 2011). This is the important role which the one to one training sessions played in the achievement of the significant shift in the e-asTTle results which is somewhat obscured by the seeming significance of the explicit instruction on the students' results. The one to one training sessions successfully facilitated student think alouds consequently positioning both teacher and student in an environment which coached student understanding (Deshler et al., 2007; Duffy, 2002).

The think alouds, which formed the basis of the instruction during the one to one training sessions, were platforms which enabled crucial learning conversations about comprehension to take place. The think alouds exposed processes which are generally, especially at secondary school, silent and private. Because students usually comprehend in silence, the teacher does not get to actually see what processes the student is employing as they comprehend (Dennis, 2009). For example, e-asTTle was able to produce a report that identifies skill gaps in students' comprehension processes such as the identification of the main idea in texts. But the conversations that the researcher/teacher was able to have with students as a result of the think alouds went deeper to show what the root of the comprehension problem was, for example, the miscomprehension of pronoun inferences.

The conversations provided the teacher with the opportunity to identify errors in students' understanding through their text interpretations and respond to those inaccuracies in a timely manner, as exemplified by CS3's misunderstanding that 'you' meant the mother when it actually referred to the two children in *Boy Overboard* (Gallimore & Tharp, 1990; Gleitzman, 2002; Nokes & Dole, 2004). The conversation surrounding this example flagged to the teacher that CS3 had misunderstood and allowed her to remedy the problem immediately, not six weeks later in an end-of-unit written test. Errors became opportunities for socially constructed learning (Pressley et al., 1994). But as CS4's response to the intervention demonstrated, there was a fine line, usually defined by the student's unique ZPD, between teachers supporting students towards success where the onus of the learning was on the pupils and teachers doing the work for students meaning they actually learnt very little (Pressley et al., 1994). The conversations were an opportunity for the teacher to overcome assumptions about student comprehension processes, get to the root of any issues and then provide an opportunity to fix them (Nokes & Dole, 2004; Vygotsky, 1978).

The conversations also lifted the intensity of the intervention as they involved the teacher more in the development of the comprehension processes taking place in the student's head (Duffy, 2002; Snow & Sweet, 2003). Increased emphasis on teacher led learning has been found to be beneficial to students because it increases the amount of expert modelling and feedback to students (Dole et al., 2009; Murphy et al., 2005; Pressley et al., 1992). Increased intensity was one of the elements that made TSI more successful than Reciprocal Teaching (Duffy, 2002). These findings seem to have been replicated with this intervention. The think alouds demonstrated when students did not understand and the researcher/teacher was able

to respond to this misunderstanding by, for example, re-explaining the metacognitive aspects of each strategy as necessary.

Additionally, because the students' reading comprehension needs were constantly being responded to during the one to one training sessions as a result of the think alouds, students were forced to engage with the strategies and the text which in turn minimised behavioural and confidence issues. For example, CS1's consistent behavioural issues became less of an issue during one to one training sessions, and not just because he was taken out of class to complete them. The change in his behaviour suggests that he knew reading was important and responded well to a teacher taking the time to sit with him, work on it and ignore his usual disruptions. CS2's 'ums' and 'ahhs', giggling and uncertain answers, as well as CS3's 'I-don't-know' replies also became less prevalent in their later training sessions. The students responded in this way because the teacher was able to reassure them, in detail, of what they were doing right and then guide them further on how to do it better. Teacher encouragement provided a safe environment to 'test out' the strategies. The think alouds allowed the teacher to act as a safety net which meant students were generally successful in their initial forays and, consequently, felt more confident to keep attempting strategy use which led to the internalisation of the key elements of each strategy (Bjorklund, 2005; Daniels, 2001; McDevitt & Ormrod, 2002; Tudge, 1990; Vygotsky, 1978, 1986; Wertsch, 1985).

5.3.6 Working in the ZPD

The think alouds during the one to one training sessions were an extremely important aspect of this intervention because of the way in which they fostered the ability of the teacher and the student to work within the student's ZPD. It was during the conversations that emerged from the think alouds that meaningful learning from meaningful child-adult interactions occurred (McDevitt & Ormrod, 2002). Because of the unique nature of these conversations and their innate ability to be flexible and responsive to student needs, they were able to operate within each student's ZPD (Bjorklund, 2005). The information that arose from the think aloud conversations also informed the direction of the explicit strategy teaching, for example the focus on inference which emerged as a process in need of development during the think alouds. Consequently, the explicit teaching was also directly working within student ZPDs nurturing their emerging understandings. The success of the think alouds and the explicit teaching to effectively target student ZPDs during this intervention is reflected in the significance of the e-asTTle scores movement and shows how the intervention was able to successfully target and optimise the development of the maturing cognitive processes as

opposed to those that had already been mastered and those that were outside of the student's potential (Bjorklund, 2005; Vygotsky, 1978, 1986). The speed with which the intervention was able to move many of the students' progress demonstrates the theory that cognitive skills such as comprehension will develop more quickly in child/ adult ZPD relationships because the ZPD optimises the learning (Bjorklund, 2005; McDevitt & Ormrod, 2002).

By working in the ZPD, students' learning was accelerated because it also provided an opportunity to systematically teach students the skills to the highest possible levels because students were constantly being nudged to higher levels of skill through questioning, prompting and coaxing by the researcher/teacher (Pressley et al., 1994; Pressley et al., 1992; Schuder, 1993; Spear-Swerling, 2011). This also demonstrated the moveable nature of the ZPD in that once skills had been mastered at a basic level, the potential to develop them to a higher level became opportune (Vygotsky, 1978, 1986, 2011; Wertsch, 1985). Subsequently one of the most important features of teaching in the ZPD is that the teacher is encouraged to see only the potential in student abilities rather than the deficits. This allows teachers to have the "…fearless expectation…" that students will participate in their own learning and begin to accelerate it as a result of working in the ZPD (Jackson & Cooper, 2007, p. 247). CS1 is a good example of having such expectations. He actively fought the intervention throughout its entirety by behaving poorly, but the teacher fought his behaviours in the belief this intervention could help his reading. CS1 began to believe the strategies could help him and he began to engage with them. Consequently, he achieved significant e-asTTle score growth compared to the national normative trends.

These same levels of expectation were evident in the literature describing TSI. TSI set higher expectations than just the mere remediation of reading problems and instead looked to accelerate student progress towards normative levels (Schuder, 1993). The benefits of these expectations were replicated in this study because, by working in each student's ZPD, the teacher was not just assessing strategy use and comprehension but working with the student to refine their skills and constantly pushing forward to the next level of development by building on their existing knowledge base.

5.4 Factors which Impeded Acceleration

Where students were unable to accelerate their comprehension learning in response to the intervention, often other causes were at play. The perceived failure of the intervention to shift the student's comprehension skills forced the teacher to dig deeper to find these causes. For example, CS3's decoding issues meant that she was unable to benefit fully from an intervention solely focused on comprehension strategies. Decoding is generally not considered to be problematic in students of this age but clearly, and from the perspective of the Simple View of Reading, CS3's lack of automatic decoding was a significant barrier to her taking full advantage of the comprehension strategies instruction (Byrnes, 2008; Gough & Tunmer, 1986; Hoover & Tunmer, 1993; Kamhi & Catts, 2012; Nation, 2005; Spear-Swerling & Sternberg, 1996; Tunmer & Greaney, 2008; Vygotsky, 1986; Wren, 2000). Subsequently, until CS3's decoding skills were more refined and automatic it was unlikely that she would move her e-asTTle comprehension score significantly.

Attitudinal factors were also an important factor for those students whose progress did not accelerate as a result of the intervention. CS4's dislike of reading, for example, was a significant obstacle to her development, although teacher persistence was finally able overcome this barrier. CS4's negative attitude towards reading and consequent passive refusal to engage in the strategy use, meant that the meaningful student-teacher interactions that would have accelerated her comprehension development did not occur (Bjorklund, 2005; Daniels, 2001; McDevitt & Ormrod, 2002; Tudge, 1990; Vygotsky, 1978, 1986, 2011). The first and second training sessions missed the all-important student-teacher interactive element because CS4's long silences resulted in the teacher doing all of the thinking for the student. This lack of interaction meant that there was little of the effective conversation which leads to the eventual internalization of strategies by students (Bjorklund, 2005; McDevitt & Ormrod, 2002).

This situation changed during CS4's third training session. During this session, the teacher waited out the silences and asked questions which forced the student to participate. This resulted in successful strategy use and the beginnings of the same developmental trajectory as students whose learning had accelerated as a result of the intervention. So whilst the highly responsive nature of this type of instruction is extremely desirable, it also demonstrates the importance of the adult carefully judging the level of their support so that students receive just enough support to facilitate their own thinking and learning which can overcome any negative

attitudinal barriers (Gallimore & Tharp, 1990; Jackson & Cooper, 2007; Vygotsky, 1978, 1986, 2011).

Conceivably an additional cause of CS4's disengagement was her belief that, although disliking reading, she was good at it despite being below the national expectation for her age group. As a result she refused to use the strategies as she did not view them as useful. Unlike other students, such as CS1, who began the intervention with lower self-concepts about their reading ability and therefore were able to attribute their new found success with texts to the strategies encouraging further use and development, CS4 could not see the point (Chapman & Tunmer, 2003; Guthrie, Wigfield, Metsala, & Cox, 1999; Pressley, 2006; Ruddell, 1996). This situation might have being compounded by the assigned texts, despite being Year 10 level, not posing a significant challenge to read for CS4, consequently providing little motivation to attempt strategy use (Pressley, 2006). CS4's delayed strategy use which began during her third training session may reflect this as she possibly felt an increase in the level of text difficulty as the texts changed from fictitious narratives to a range of factual articles and fact sheets. It was feasibly this change, along with the teacher forcing CS4 to interact during the training sessions, which finally forced her to use the strategies because she began to see them as a way to understand the texts.

5.5 Summary

The results of the intervention demonstrate that metacognitive comprehension strategy training was able to significantly accelerate the reading achievement of this group of struggling readers. Importantly, the strategies provided an entry point to text engagement which supported students to change from passive decoders into active readers. This transformation was supported through the use of explicit instruction in strategy use which explained the metacognitive underpinnings of each strategy as well as demonstrating for students how to use each one. Student think alouds were an important opportunity for students to receive guided practice and immediate feedback on their strategy use. The one to one training sessions in which the think alouds took place provided an opportunity to work within students' ZPDs which accelerated their comprehension learning. The think alouds also revealed to the teacher the next steps for learning that the class should take as a whole. Two important factors impeded the effects of the intervention for some students. Decoding difficulties meant that some students were not able to take advantage of the effects of the intervention as they were deficient in an important prerequisite skill. For other students, attitudinal issues delayed

the effect of the intervention as it took the teacher sometime to overcome this barrier by convincing the student of the utility of the strategies.

Chapter Six Conclusion

This study sought to examine to what extent, and how, a 10 week metacognitive comprehension strategies training intervention would affect the comprehension achievement of a group of Year Nine and Ten struggling readers in a small, low decile, rural secondary school in New Zealand.

The intervention focused on four main comprehension strategies: finding text features, questioning, summarizing and inferencing. Each of the strategies was targeted for two weeks beginning with the explicit explanation of the procedural, declarative and conditional knowledge of each strategy and the modeling of its use by the teacher. Students then engaged in independent practice of the strategies supported by graphic organizers. They also participated in one to one training sessions with the teacher. The last two weeks of the intervention targeted the use of all strategies simultaneously.

An e-asTTle reading comprehension test was used to measure the extent of the achievement shift as a result of the intervention. An analysis of the pre- and post-intervention e-asTTle results of the students suggested significant progress was made by many of these students against the national normative trends for the same data tool. Case studies were employed to examine how the intervention affected the comprehension development of students who made significant progress and students who did not. The case studies made use of the transcripts of the recorded one to one training sessions, student work during the intervention as well as e-asTTle data. The two case studies that demonstrated the significant progress were able to show that the explicit explanation and modeling of comprehension strategies by the teacher encouraged students to become active readers who interacted with the text, as opposed to being simple passive decoders. By working one on one with students, the teacher was able to intensify the level of learning by working within their ZPD. Important learning conversations about comprehension took place during these training sessions which optimized and accelerated learning.

The two case studies that demonstrated insignificant progress were able to examine the causes of comprehension stagnation. One case study showed the importance of advanced and automatic decoding instruction for adolescents who need it. This student was unable to progress her comprehension to the same levels as her peers demonstrating the Simple View framework of effective reading being a combination of both decoding and comprehension. The

other case study demonstrated the need for adolescents to see the importance of using comprehension strategies and how they can improve their comprehension. CS4 demonstrated how some students may take longer to grow their achievement in the face of intervention because they take longer to buy into the strategy use.

For all students, it was found that by working in their ZPD a high expectation was placed on their ability to comprehend what they read. Generally, students rose to meet this expectation. Thus in no way, was this intervention about the simplification of materials for struggling readers. It was about working within their ZPD to help them understand year level texts by using metacognitive comprehension strategies. It was about having the expectation that with high levels of teacher explanation, modeling, scaffolding, support and guidance, these struggling readers could significantly move their reading achievement forward. Having such expectations, of both students and teachers, has the real potential to lift the tail of New Zealand's achievement gap.

6.1 Design Limitations

There were some design limitations which may impact the validity and generalizability of this research. The small sample size makes the results of this study hard to generalise to a larger population. This limitation is further compounded by the geographic homogeneity of the sample. The researcher/teacher is another limitation in that this person was an experienced teacher who had a high level of understanding of strategy use and how to develop this in students. A different teacher, without the same level of experience and understanding, might not be able to develop student understanding to the same level. The length of the intervention also means that is not possible to judge if the developments in comprehension were maintained by students over a longer period of time than just ten weeks. Therefore, these findings need replication on a much wider scale and across a longer time period to be considered more broadly valid.

The reliability of this study would have also been enhanced through the use of more than one quantitative data instrument to validate the significant shift in achievement that was a result of this intervention. Additionally, the change in medium of the test that was used, from an online pre-intervention test to a post-intervention paper test, may also account for some of the shift in achievement as students may have found it easier to sit the test on paper. However, e-asTTle is designed to be sat in either an online or paper format so the impact of this change of medium is thought to be minimal.

Despite the literature suggesting that little training needed to be given to students on how to think aloud as they read because thinking aloud is simply a reflection of what participants are doing anyway, participants were more confident in what they were being asked to do in later training sessions (Anders Ericsson & Simon, 1984/1993; Marr, 1983; Pressley & Afflerbach, 1995). Some teacher prompting was also required, at times, to remind participants to think aloud (Pressley & Afflerbach, 1995). Therefore, the think aloud transcriptions might not represent a full account of a student's understanding at any one time or fully account for the changes in student understanding across a period of time.

Despite the scaffolding of student reflection, this was not the richest form of data collected during this study. The transcriptions of the training sessions garnered much more complete information about how students were developing their comprehension in response to the strategy training. This possibly reflects a lack of understanding by the students on what they were supposed to discuss in the reflections. It may also reflect students' developing awareness of their own reading which meant that they were not yet able to articulate clearly to themselves their strategy use. Short oral reflections at the end student think alouds scaffolded by teacher questioning revealed more information than the written reflections further reflecting a lack of written skill which stunted students' ability to report their understandings on paper.

6.2 Future Research Pathways

The findings of this study also lead to more questions that deserve future in-depth examination. Initially, replication of these results on a much wider scale is necessary to validate these findings and examine how they could transfer to very different settings. It would also be interesting to investigate how progress is maintained after the end of the intervention as well as how these results affect student efficacy and school retention rates. Another interesting thread of possible study would be to examine how professional development could support teachers to achieve similar results in classrooms across New Zealand.

References

Afflerbach, P. (2002). Teaching reading self-assessment strategies. In C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practice* (pp. 96-114). New York, NY: Guildford Press.

Afflerbach, P., & Cho, B. Y. (2010). Determining and describing reading strategies: Internet and traditional forms of reading. In H. Salatas-Waters & W. Schneider (Eds.), *Metacognition, strategy use, and instruction* (pp. 201-225). New York, NY: Guildford Press.

Alton Lee, A. (2001). Research ethics, classroom research and educational practice. In M. Tolich (Ed.), *Research ethics in Aotearoa New Zealand* (pp. 87-98). Auckland, New Zealand: Pearson Education.

Alvermann, D. E. (2006). Struggling adolescent readers: A cultural construction. In A. McKeogh, L. Phillips, V. Timmons & J. L. Lupart (Eds.), *Understanding literacy development: A global view* (pp. 95-112). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Alvermann, D. E., & Eakle, A. J. (2003). Comprehension instruction: Adolescents and their multiple literacies. In A. P. Sweet & C. E. Snow (Eds.), *Rethinking reading comprehension* (pp. 12-29). New York, NY: Guildford Press.

Anders Ericsson, K. (2002). Towards a procedure for eliciting verbal expression of non-verbal experience without reactivity: Interpreting the verbal overshadowing effect within the theoretical framework for protocol analysis. *Applied Cognitive Psychology, 16*, 981-987.

Anders Ericsson, K., & Simon, H. A. (1984/1993). *Protocol analysis: Verbal reports as data* (Revised ed.). Cambridge, MA: Bradford.

Anderson, V., & Roit, M. (1993). Planning and implementing collaborative strategy instruction for delayed readers in grades 6-10. *The Elementary School Journal, 94*, 121-137.

Anzures, G., Lee, K., & Freire, A. (2011). Cognitive development in adolescence. In A. Slater & G. Bremner (Eds.), *An introduction to developmental psychology* (2nd ed., pp. 517-550). Chichester, England: BPS Blackwell.

Archer, A., Gleason, M., & Vachon, V. (2003). Decoding and fluency: Foundation skills for older struggling readers. *Learning Disability Quarterly, 26*, 89-101.

Baker, L. (2002). Metacognition in comprehension instruction. In C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 77-95). New York, NY: Guildford Press.

Baker, L., & Carter-Bell, L. (2009). Metacognitive processes and reading comprehension. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 373-388). New York, NY: Routledge.

Bauer, D., Golson-Bradley, L., & Dillon, L. (2010). Beyond "written off": Surviving and thriving through adolescent literacy. In J. L. DeVitis & J. L. Irwin-DeVitis (Eds.), *Adolescent education: A reader* (pp. 263-279). New York, NY: Peter Lang.

Beard El-Dinary, P., Pressley, M., Coy-Ogan, L., Schuder, T., & Strategies Instruction Teachers at Burnt Mills Elementary School. (1994). *The teaching practices of transactional strategies instruction teachers as revealed through collaborative interviewing* Washington, DC: Office of Educational Research and Improvement.

Becker, L. A. (1999). Effect size calculators. Retrieved June, 2012, from http://www.uccs.edu/~faculty/lbecker/

Bjorklund, D. F. (2005). *Children's thinking: Cognitive development and individual differences* (4th ed.). Belmont, CA: Wadsworth / Thomson Learning.

Bjorklund, D. F., Muir-Broaddus, J. E., & Schneider, W. (1990). The role of knowledge in the development of strategies. In D. F. Bjorklund (Ed.), *Children's strategies: Contemporary views of cognitive development* (pp. 93-128). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Bledsoe, K. L., & Hopson, R. K. (2009). Conducting research and evaluation in underserved communities. In D. M. Mertens & P. E. Ginsberg (Eds.), *The handbook of social research ethics* (pp. 391-406). Thousand Oaks, CA: Sage.

Block, C., Schaller, J., Joy, J., & Gaine, P. (2002). Process-based comprehension instruction: Perspectives of four reading educators. In C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 42-61). New York, NY: Guildford Press.

Burke, J. (2007). Teaching English language arts in a "flat" world. In K. Beers, R. Probst & L. Rief (Eds.), *Adolescent literacy: Turning promise into practice* (pp. 149-166). Portland, NH: Heinemann.

Byrnes, J. P. (2008). *Cognitive development and learning in instructional contexts.* Boston: Pearson & AB.

Cain, K. (2010). Reading for meaning: The skills that support reading comprehension and its development. In K. Hall, V. Goswami, C. Harrison, S. Ellis & J. Soler (Eds.), *Interdisciplinary perspectives on learning to read: Culture, cognition and pedagogy* (pp. 74-86). New York, NY: Routledge.

Cain, K., & Oakhill, J. (2009). Reading comprehension development from 8 to 14 years: The contribution of component skills and processes. In R. Wagner, C. Schatschneider & C. Phythian-Sence (Eds.), *Beyond decoding: The behavioural and biological foundations of reading comprehension* (pp. 143-175). New York, NY: Guildford Press.

Cassidy, J., Ortlieb, E., & Shettel, J. (2011). What's hot for 2011: Survey reveals a focus beyond primary grades. Retrieved 20th December, 2011, from http://www.reading.org/General/Publications/ReadingToday/RTY-decjan-20102011-surveyprimary.aspx

Chapman, J., & Tunmer, W. (2003). Reading difficulties, reading-related self-perceptions, and strategies for overcoming negative self-beliefs. *Reading & Writing Quarterly, 19*, 5-24.

Chi, M. (1997). Quantifying qualitative analyses of verbal data: A practical guide. *The Journal of Learning Sciences, 6*(3), 271-315.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). New York, NY: Routledge.

Collins, S. (2009). Ecology and ethics in participatory collaborative action research: An argument for the authentic participation of students in educational research. In R. A. Schmuck (Ed.), *Practical action research: A collection of articles* (2nd ed., pp. 214-229). Thousand Oaks, CA: Corwin Press.

Conley, M. (2009). Improving adolescent comprehension: Developing comprehension strategies in the content areas. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 531-550). New York, NY: Routledge.

Conley, M., Freidhoff, J. R., Gritter, K., & Van Duinen, D. V. (2008). Strategies that improve adolescents' performance with content area texts. In M. Conley, J. R. Freidhoff, M. B. Sherry & S. F. Tuckey (Eds.), *Meeting the challenge of adolescent literacy: Research we have, research we need* (pp. 88-103). New York, NY: Guildford Press.

Crawford, G. (2008). *Differentiation for the adolescent learner: Accomodating brain development, language, literacy, and special needs*. Thousand Oaks, CA: Corwin Press.

Daniels, H. (2001). *Vygotsky and pedagogy*. London, England: RoutledgeFalmer.

Davis, A., & Winstone, N. (2011). Educational implications. In A. Slater & G. Bremner (Eds.), *An introduction to developmental psychology* (2nd ed., pp. 587-612). Chichester, England: BPS Blackwell.

Dennis, D. V. (2009). "I'm not stupid": How assessment drives (in)appropriate reading instruction. *Journal of Adolescent & Adult Literacy, 53*(4), 283-290.

Deshler, D. D., Sullivan-Palincsar, A., Biancarosa, G., & Nair, M. (2007). *Informed choices for struggling adolescent readers: A research based guide to instructional programs and practices*. New York, NY: International Reading Association.

Dole, J. A., Nokes, J. D., & Drits, D. (2009). Cognitive strategy instruction. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 347-372). New York, NY: Routledge.

Duffy, G. G. (2002). The case for direct explanation of strategies. In C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 28-42). New York, NY: Guildford Press.

Education Review Office. (2007). *Waitara High School*. Wellington, New Zealand: Education Review Office.

Fagella-Luby, M., & Sampson Garner, P. (2010). Literacy supports for adolescent struggling readers: Taking action through comprehension instruction. In T. E. Scruggs & M. A. Mastropieri (Eds.), *Advances in learning and behavioural disabilities: Literacy and learning* (Vol. 23, pp. 61-94). Bingley, England: Emerald.

Falk-Ross, F., & Hurst, S. (2009). How can we use adolescents' language and classroom discourse to enhance critical thinking practices? In J. Lewis (Ed.), *Essential questions in adolescent literacy: Teachers and researchers describe what works in classrooms* (pp. 156-175). New York, NY: Guildford Press.

Forrest, S. (2006). Three foci of an effective high school generation 1.5 literacy program. *Journal of Adolescent and Adult Literacy, 50*(2), 106-112.

Frances, H. (2008). So, who's your hero? In D. Chadwick (Ed.), *Choices: Heroes* (pp. 10-16). Wellington, New Zealand: Learning Media.

Friend, P. (2007). Invisible boy. In D. Chadwick (Ed.), *Choices: Animal tales* (pp. 18-23). Wellington, New Zealand: Learning Media.

Fuchs, D., & Fuchs, L. S. (2006). Introduction to response to intervention: What, why, and how valid is it? *Reading Research Quarterly, 41*, 93-99.

Gallimore, R., & Tharp, R. (1990). Teaching mind in society: Teaching, schooling and literate discourse. In L. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of sociohistorical pyschology* (pp. 175-205). Cambridge, England: Cambridge University Press.

Galotti, K. M. (2011). *Cognitive development: Infancy through adolescence*. Los Angeles, CA: Sage.

Garner, R. (1990). Children's use of strategies in reading. In D. F. Bjorklund (Ed.), *Children's strategies: Contemporary views of cognitive development* (pp. 245-268). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Gaskins, I. W. (2003). Taking charge of reader, text, activity and context variables. In A. P. Sweet & C. E. Snow (Eds.), *Rethinking reading comprehension* (pp. 141-165). New York, NY: Guildford Press.

Gaskins, I. W., Downer, M., Anderson, R., Cunningham, P., Gaskins, R., Schommer, M., & The Teachers of Benchmark School. (1988). A metacognitive approach to phonics: Using what you know to decode what you don't know. *Remedial and Special Education, 9*(1), 36-41.

Gay, L. R., Mills, G. E., & Airasian, P. (2006). *Educational research: Competencies for analysis and applications* (8th ed.). Upper Saddle River, NJ: Pearson.

Gee, M. (2009). *Under the mountain*. Auckland, New Zealand: Penguin.

Gibbison, S. (2007). A scream in the night. In D. Chadwick (Ed.), *Choices: Animal tales* (pp. 10-13). Wellington, New Zealand: Learning Media.

Gleitzman, M. (2002). *Boy overboard*. Camberwell, Australia: Penguin.

Glenday, C. (Ed.). (2006). *Guiness world records 2007*. London, England: Guiness World Records Limited.

Gorard, S., & Taylor, C. (2004). *Combining methods in educational and social research*. Maidenhead, England: Open University Press.

Goswami, U. (2008). *Cognitive development: The learning brain*. Hove, England: Psychology Press.

Gough, P., & Tunmer, W. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*(1), 6-10.

Greaney, K. (2004). Factors affecting PAT reading comprehension performance: A retrospective analysis of some Year 4-6 data. *New Zealand Journal of Educational Studies, 1*, 3-21.

Greaney, K., Tunmer, W., & Chapman, J. (1997). The use of rime-based orthographic analogy training as an intervention strategy for reading-disabled children. In B. Blachman (Ed.), *Foundations of reading acquistion: Implications for early intervention* (pp. 327-345). New Jersey, NJ: Lawrence Erlbaum Associates Inc.

Guthrie, J. (2011). CORI: Concept Oriented Reading Instruction. Retrieved April, 2011, from http://www.cori.umd.edu/

Guthrie, J., Anderson, E., Alao, S., & Rinehart, J. (1999). Influences of Concept Oriented Reading Instruction on strategy use and conceptual learning from text. *The Elementary School Journal, 99*(4), 343-366.

Guthrie, J., McRae, A., Coddington, C., Klauda, S., Wigfield, A., & Barbosa, P. (2009). Impacts of comprehensive reading instruction on diverse outcomes of low and high achieving readers. *Journal of Learning Disabilities, 42*(3), 195-214.

Guthrie, J., & Ozgungor, S. (2002). Instructional contexts for reading engagement. In C. Block & M. Pressley (Eds.), *Comprehension instruction: Research based best practices* (pp. 275-288). New York, NY: Guildford Press.

Guthrie, J., Van Meter, P., McCann, A., Anderson, E., & Alao, S. (1996). *Does Concept Oriented Reading Instruction increase motivation, strategies and conceptual learning?* Washington, DC: Office of Educational Research and Improvement.

Guthrie, J., Wigfield, A., Metsala, J., & Cox, K. (1999). Motivational and cognitive predictors of text comprehension and reading amount. *Scientific Studies of Reading, 3*, 231-256.

Hay, I., & Israel, M. (2006). *Research ethics for social scientists*. London, England: Sage.

Hedges, H. (2001). A right to respect and reciprocity: Ethics and educational research with children. *New Zealand Research in Early Childhood Education, 4*, 1-18.

Hinchman, K. (2008). Intervening when older youths struggle with reading: Teach me what I need to know next. In M. Conley, J. Freidhoff, M. Sherry & S. Forbes-Tuckey (Eds.), *Meeting the challenge of adolescent literacy: Research we have, research we need* (pp. 11-35). New York, NY: Guildford Press.

Holler, K. A., & Greene, S. M. (2010). Developmental changes in children's executive functioning. In E. Hollister Sandberg & B. L. Spritz (Eds.), *A clinician's guide to normal cognitive development in childhood* (pp. 215-240). New York, NY: Routledge.

Hoover, W., & Tunmer, W. (1993). The components of reading. In G. B. Thompson, W. E. Tunmer & T. Nicholson (Eds.), *Reading acquisition processes* (pp. 1-19). Clevedon, England: Multilingual Matters.

Howe, M. L., & O'Sullivan, J. T. (1990). The development of strategic memory: Coordinating knowledge, metamemory, and resources. In D. F. Bjorklund (Ed.), *Children's strategies: Contemporary views of cognitive development* (pp. 129-156). Hillsdale, NJ: Lawrence Erlbaum Associates.

Israel, S. E. (2008). Flexible use of comprehension monitoring strategies: Investigating what a complex reading framework might look like. In K. B. Cartwright (Ed.), *Literacy processes: Cognitive flexibility in learning and teaching* (pp. 188-207). New York, NY: Guildford Press.

Jackson, Y., & Cooper, E. (2007). Building academic success with underachieving adolescents. In K. Beers, R. Probst & L. Rief (Eds.), *Adolescent literacy: Turning promise into practice* (pp. 243-256). Portland, NH: Heinemann.

Jitendra, A., & Gajira, M. (2011). Main idea and summarization instruction to improve reading comprehension. In R. O'Connor & P. Vadasy (Eds.), *Handbook of reading interventions* (pp. 198-219). New York, NY: Guildford Press.

Juel, C. (1996). What makes literacy tutoring effective? *Reading Research Quarterly, 31*, 268-289.

Kamhi, A. G., & Catts, H. W. (2012). *Language and reading disabilities* (3rd ed.). Boston, MA: Pearson.

Kelley, M., & Clausen-Grace, N. (2007). *Comprehension shouldn't be silent: From strategy instruction to student independence*. Newark, DE: International Reading Association.

Klinger, J. K., Morrison, A., & Eppolito, A. (2011). Metacognition to improve reading comprehension. In R. O'Connor & P. Vadasy (Eds.), *Handbook of reading interventions* (pp. 220-253). New York, NY: Guildford Press.

Kopelmann, L. (2006). When should research with infants, children, or adolescents be permitted? In A. Smith-Iltis (Ed.), *Research ethics: Routledge annals of bioethics* (pp. 121-131). New York, NY: Routledge.

Krathwohl, D. (2009). *Methods of educational and social science research: The logic of methods* (3rd ed.). Long Grove, IL: Waveland Press Inc.

Lee, C. D., & Spratley, A. (2010). *Reading in the disciplines: The challenges of adolescent literacy*. New York, NY: Carnegie Corporation.

Lewis, J., & Jones, B. (2009). How can what we know about adolescent learners be used to benefit our literacy instruction? In J. Lewis (Ed.), *Essential questions in adolescent literacy: Teachers and researchers describe what works in classrooms* (pp. 3-35). New York, NY: Guildford Press.

Lewis, J., & Reader, T. (2009). How can we help adolescent readers meet the challenges of academic text? In J. Lewis (Ed.), *Essential questions in adolescent literacy: Teachers and researchers describe what works in classrooms* (pp. 101-131). New York, NY: Guildford Press.

Lodico, M., Spaulding, D., & Voegtle, K. (2006). *Methods in educational research: From theory to practice*. San Francisco, CA: Jossey-Bass.

Loveridge, J. (2010). *Involving children and young people in research in educational settings*. Wellington, New Zealand: Ministry of Education.

Marcell, B., DeCleene, J., & Juettner, M. (2010). Caution! Hard hat area! Comprehension under construction: cementing a foundation of comprehension strategy usage that carries over to independent practice. *The Reading Teacher, 63*(8), 687-691.

Marr, M. (1983). *Verbal reports: How readers process unfamiliar text*. Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Canada.

Marshall, N., Caygill, R., & May, S. (2008). PISA 2006: Reading literacy - how ready are our 15 year olds for tomorrow's world? Retrieved August, 2010, from http://www.educationcounts.govt.nz/publications/schooling/2543/pisa_2006/29190/2

Massey University. (2010). Code of ethical conduct for research, teaching and evaluations involving human participants. Retrieved August, 2010, from http://www.massey.ac.nz/massey/fms//Human%20Ethics/Documents/MUHEC%20Code%202010.pdf

McDevitt, T. M., & Ormrod, J. E. (2002). *Child development and education*. Upper Saddle River, NJ: Merrill Prentice Hall.

McDonald, T., Thornley, C., Thomson, C., Pullar, K., Pullar, M., & Low, H. (2008). Raising students' literacy achievements in secondary school: Findings from teacher-researcher partnerships. *SET, 2*, 46-51.

McDowall, S. (2010). Literacy teaching and learning for the 21st century: Bridging the theory to practice gap. *SET, 2*, 2-9.

McKenna, M. (2002). *Help for struggling readers: Strategies for grades 3-8*. New York, NY: Guildford Press.

Miller, P. H. (1990). The development of strategies of selective attention. In D. F. Bjorklund (Ed.), *Children's strategies: Contemporary views of cognitive development* (pp. 157-184). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Ministry of Education. (2010). e-asTTle norm tables September 2010. Retrieved June, 2012, from http://e-asttle.tki.org.nz/Teacher-resources

Ministry of Education. (2012). e-asTTle reading comprehension test. Retrieved February 2012, from http://e-asttle.tki.org.nz/

Moats, L. (1998). Teaching decoding. *American Educator / American Federation of Teachers, Spring / Summer*, 1-9.

Moje, E. B. (2008). Responsive literacy teaching in secondary school content areas. In M. Conley, J. R. Freidhoff, M. Sherry & S. F. Tuckey (Eds.), *Meeting the challenge of adolescent literacy: Research we have, research we need* (pp. 58-87). New York, NY: Guildford Press.

Moore, D., Bean, T., Birdyshaw, D., & Rycik, J. (1999). Adolescent literacy: A position statement. *Journal of Adolescent and Adult Literacy, 43*(1), 97-112.

Moses, L. J., Carlson, S., & Sabbagh, M. A. (2005). On the specificity of the relation between executive function and children's theories of mind. In W. Schneider, R. Schumann-Hengsteler & B. Sodian (Eds.), *Young children's cognitive development: Interrelationships among executive functioning, working memory, verbal ability and theory of mind* (pp. 131-146). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Murphy, E., Grey, I., & Honan, R. (2005). Cooperative learning for students with difficulties in learning: A description of models and guidelines for implementation. *British Journal of Special Education, 32*(3), 158-164.

Nation, K. (2005). Children's reading comprehension difficulties. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 248-265). Oxford, England: Blackwell.

Nicholson, W. (2000). *The wind singer*. London, England: Egmont Books Limited.

Nokes, J. D., & Dole, J. A. (2004). Helping adolescent readers through explicit strategy instruction. In T. L. Jetton & J. A. Dole (Eds.), *Adolescent literacy research and practice* (pp. 162-182). New York, NY: Guildford Press.

Ntseane, P. G. (2009). The ethics of the researcher-subject relationship: Experiences from the field. In D. M. Mertens & P. E. Ginsberg (Eds.), *The handbook of social research ethics* (pp. 295-307). Thousand Oaks, CA: Sage.

O'Toole, J., & Beckett, D. (2010). *Educational research: Creative thinking and doing*. Melbourne, Australia: Oxford University Press.

Oliver, P. (2003). *The student's guide to research ethics*. Maidenhead, England: McGraw-Hill Education.

Onwuegbuzie, A. J., & Collins, K. (2007). A typology of mixed methods sampling designs in social science research. *The Qualitative Report, 12*(2), 281-316.

Onwuegbuzie, A. J., & Leech, N. L. (2007). Sampling designs in qualitative research: Making the sampling process more public. *The Qualitative Report, 12*, 238-254.

Palincsar, A. (1987). *Collaborating for collaborative learning of text comprehension.* Paper presented at the Annual Meeting of the American Educational Research Association, Washington, DC.

Palincsar, A., & Brown, A. (1983). *Reciprocal teaching of comprehension monitoring activities*. Urbana, IL: Center for Study of Reading.

Parris, S., & Block, C. (2008). The impact of flexibility on vocabulary and comprehension development. In K. B. Cartwright (Ed.), *Literacy processes: Cognitive flexibility in learning and teaching* (pp. 257-277). New York, NY: Guildford Press.

Pressley, M. (2002). Comprehension strategies instruction: A turn-of-the-century status report. In C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 11-27). New York, NY: Guildford Press.

Pressley, M. (2006). *Reading instruction that works: The case for balanced teaching* (3rd ed.). New York, NY: Guildford Press.

Pressley, M., & Afflerbach, P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading*. Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Pressley, M., El-Dinary, P. B., Brown, R., Schuder, T., Pioli, M., Green, K., . . . Gaskins, I. (1994). *Transactional instruction of reading comprehension strategies*. Washington, DC: Office of Educational Research and Improvement.

Pressley, M., El-Dinary, P. B., Gaskins, I., Schuder, T., Bergman, J. L., Almasi, J., & Brown, R. (1992). Beyond direct explanation: Transactional instruction of reading comprehension strategies. *The Elementary School Journal, 92*(5), 513-555.

Pressley, M., & Hilden, K. (2006). Teaching reading comprehension. In A. McKeogh, L. Phillips, V. Timmons & J. L. Lupart (Eds.), *Understanding literacy development: A global view* (pp. 49-64). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Rainforth, H. (2009). Do you live in a grass hut? In D. Chadwick (Ed.), *Choices: Journeys* (pp. 6-9). Wellington, New Zealand: Learning Media.

Raphael, T., Weber, G., & Nies, A. (2009). Approaches to teaching reading comprehension. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 449-469). New York, NY: Routledge.

Reeder, J. A., Martin, S. E., & Turner, G. F. W. (2010). Memory development in childhood. In E. Hollister Sandberg & B. L. Spritz (Eds.), *A clinician's guide to normal cognitive development in childhood* (pp. 215-240). New York, NY: Routledge.

Ross, S. G., & Begeny, J. C. (2011). Improving Latino, English language learners' reading fluency: The effects of small-group and one-on-one intervention. *Psychology in the Schools, 48*(6), 604-618.

Ruddell, R. (1996). Those influential literacy teachers: Meaning and motivation builders. *Reading Forum New Zealand, 1*, 24-33.

Sasaki, T. (2008). Concurrent think-aloud protocol as a socially situated construct. *IRAL, 46*, 349-374.

Schneider, W. (2010). Metacognition and memory development in childhood and adolescence. In H. Salatas Waters & W. Schneider (Eds.), *Metacognition, strategy use, and instruction* (pp. 54-81). New York, NY: Guildford Press.

Schuder, T. (1993). The genesis of transactional strategies instruction in a reading program for at-risk students. *The Elementary School Journal, 94*(2), 183-200.

Shanahan, C., & Shanahan, T. (2008). Teaching disciplinary literacy to adolescents: Rethinking content-area literacy. *Harvard Educational Review, 78*(1), 40-59.

Sharmini, S., & Kumar, V. (2011). Planning in feedback: Insights from concurrent verbal protocols. *The Electronic Journal for English as a Second Language, 14*(4), 1-12.

Smith, V. (2010). Comprehension as a social act: Texts, contexts and readers. In K. Hall, V. Goswami, C. Harrison, S. Ellis & J. Soler (Eds.), *Interdisciplinary perspectives on learning to read: Culture, cognition and pedagogy* (pp. 61-73). New York, NY: Routledge.

Snow, C. E., & Biancarosa, G. (2003). *Adolescent literacy and the achievement gap: What do we know and where do we go from here?* New York, NY: Carnegie Corporation of New York.

Snow, C. E., & Sweet, A. P. (2003). Reading for comprehension. In A. P. Sweet & C. E. Snow (Eds.), *Rethinking reading comprehension* (pp. 1-11). New York, NY: Guildford Press.

Spear-Swerling, L. (2011). Phases in reading words and phonics interventions. In R. O'Connor & P. Vadasy (Eds.), *Handbook of reading interventions* (pp. 63-87). New York, NY: Guildford Press.

Spear-Swerling, L., & Sternberg, R. L. (1996). Roads to reading disability *Off-track: when poor readers become "learning disabled"* (pp. 113-152). Boulder, CO: Westview Press.

Stahl, S. A., & Shanahan, C. (2004). Learning to think like a historian: Disciplinary knowledge through critical analysis of multiple documents. In T. L. Jetton & J. A. Dole (Eds.), *Adolescent literacy research and practice* (pp. 94-119). New York, NY: Guildford Press.

Stanovich, K. (1986). Matthew effects in reading: Some consequences of individual differences in the acquistion of literacy. *Reading Research Quarterly, 21*(4), 360-407.

Statistics New Zealand. (2008). New Zealand life tables 2005-2007. Retrieved August, 2010, from

http://www.stats.govt.nz/browse_for_stats/health/life_expectancy/NZLifeTables_HOTP05-07.aspx
Statistics New Zealand. (2009). Convicted offenders table. Retrieved August, 2010, from http://wdmzpub01.stats.govt.nz/wds/TableViewer/tableView.aspx
Statistics New Zealand. (2010). School leavers with no qualifications. Retrieved August, 2010, from http://www.stats.govt.nz/browse_for_stats/education_and_training/secondary_education/school-leavers-with-no-qualifications/school-leavers-no-qualifications.aspx
Stockett, K. (2011). *The help*. Camberwell, Australia: Penguin.
Tatum, A. (2008). The literacy development of African American male counterparts: The influence of contexts and texts. In M. Conley, J. Freidhoff, M. Sherry & S. F. Tuckey (Eds.), *Meeting the challenge of adolescent literacy: Research we have, research we need* (pp. 36-57). New York, NY: Guildford Press.
Telford, M., & May, S. (2010). PISA 2009: Our 21st century learners at age 15 *Education Counts*. Retrieved December 2011, from http://www.educationcounts.govt.nz/publications/numeracy/pisa-2009/pisa-2009-our-21st-century-learners-at-age-15/reading-literacy-main-focus
Thornley, C., & McDonald, T. (2005). Reading across the curriculum: Secondary school students talk about themselves as readers. *SET, SET Reprints*(Students Have Their Say), 27-31.
Tonks, S. M., & Taboada, A. (2011). Developing self-regulated readers through instruction for reading engagement In B. Zimmerman & D. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 173-186). New York, NY: Routledge.
Tovani, C. (2000). *I read it, but I don't get it: Comprehension strategies for adolescent readers*. Stenhouse Publishers: Portland, Maine.
Towse, J., & Cowan, N. (2005). Working memory and its relevance for cognitive development. In W. Schneider, R. Schumann-Hengsteler & B. Sodian (Eds.), *Young children's cognitive development: Interrelationships among executive functioning, working memory, verbal ability and theory of mind* (pp. 9-38). Mahwah, NJ: Lawrence Erlbaum Associates.
Tudge, J. (1990). Vygotsky, the Zone of Proximal Development, and peer collaboration: Implications for classroom practice. In L. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of sociohistorical pyschology* (pp. 155-172). Cambridge, England: Cambridge University Press.
Tunmer, W. E., & Chapman, J. (1996). A developmental model of dyslexia: Can the construct be saved? *Dyslexia, 2*, 179-189.
Tunmer, W. E., Chapman, J., Greaney, K., & Prochnow, J. (2002). The contribution of educational psychology to intervention research and practice. *International Journal of Disability, Development and Education, 49*(1), 11-29.
Tunmer, W. E., & Greaney, K. (2008). Reading intervention research: An intergrative framework. In G. Reid, A. Fawcett, F. Manis & L. Siegel (Eds.), *The Sage handbook of dyslexia* (pp. 241-267). London, England: Sage.
Tunmer, W. E., & Greaney, K. (2010). Defining dyslexia. *Journal of Learning Disabilities, 43*(3), 229-243.
Underwood, T., & Pearson, P. (2004). Teaching struggling adolescent readers to comprehend what they read. In T. L. Jetton & J. A. Dole (Eds.), *Adolescent literacy and practice* (pp. 135-161). New York, NY: Guildford Press.

Vacca, J., Vacca, R., Gove, M., Burkey, L., Lenhart, L., & McKeon, C. (2000). *Reading and learning to read* (5th ed.). Boston, MA: Pearson Education.

van den Broek, P., White, M. J., Kendeou, P., & Carlson, S. (2009). Reading between the lines: Developmental and individual differences in cognitive processes in reading comprehension. In R. Wagner, C. Schatschneider & C. Phythian-Sence (Eds.), *Beyond decoding: The behavioural and biological foundations of reading comprehension* (pp. 107-123). New York, NY: Guildford Press.

Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades? . *Journal of Child Pyschology and Psychiatry*, 2-40.

Vellutino, F. R., Scanlon, D. M., Sipay, E., Small, S., Chen, R., Pratt, A., & Denckla, M. (1996). Cognitive profiles of difficult-to-remediate and readily remediated poor readers: Early intervention as a vehicle for distinguishing between cognitive and experiential deficits as basic causes of specific reading disability. *Journal of Educational Psychology, 88*(4), 601-638.

Vincent, C., & Warren, S. (2005). 'This won't take long...': Interviewing, ethics and diversity. In K. Sheehy, M. Nind, J. Rix & K. Simmons (Eds.), *Ethics and research in inclusive education: Values into practice* (pp. 102-118). Abingdon, Oxon: RoutledgeFalmer.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: MIT Press.

Vygotsky, L. S. (2011). The dynamics of the schoolchild's mental development in relation to teaching and learning. *Journal of Cognitive Education and Psychology, 10*(2), 198-211.

Wasik, B., & Slavin, R. (1993). Preventing early reading failure with one-to-one tutoring: A review of five programs. *Reading Research Quarterly, 28*, 179-200.

Wertsch, J. V. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.

Wharton-McDonald, R. (2008). The dynamics of flexibility in effective literacy teaching. In K. B. Cartwright (Ed.), *Literacy processes: Cognitive flexibility in learning and teaching* (pp. 342-357). New York, NY: Guildford Press.

Wilson, T. D. (1994). The proper protocol: Validity and completeness of verbal reports. *Pyschological Science, 5*(5), 249-252.

Winne, P. H. (2011). A cognitive and metacognitive analysis of self-regulated learning In B. Zimmerman & D. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 15-32). New York, NY: Routledge.

Wise, B. (2009). Adolescent literacy: The cornerstone of student success. *Journal of Adolescent and Adult Literacy, 52*(5), 369-375.

Wren, S. (2000). *The cognitive foundations of learning to read: A framework*. Austin, TX: Southwest Educational Development Laboratory.

Zeni, J. (2005). A guide to ethical issues and action research. In K. Sheehy, M. Nind, J. Rix & K. Simmons (Eds.), *Ethics and research in inclusive education: Values into practice* (pp. 205-214). Abingdon, Oxon: RoutledgeFalmer.

Zwiers, J. (2004). *Building reading comprehension habits in grades 6-12*. Newark, DE: International Reading Association.

Appendices

Appendix A: Massey University Human Ethics Committee Approval Statement

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 11/68. If you have any concerns about the conduct of this research, please contact Dr Nathan Matthews, Acting Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5799 x 8729, email humanethicsouthb@massey.ac.nz

Appendix B: Graphic Organisers

Double Entry Diary – Looking For Text Features

A text feature that I have found is…	What this text feature shows…

Triple Entry Diary - Wondering

I wonder…	Answers to my wonderings	Text features that I saw and what they meant…

A way to start using ALL of the comprehension strategies we have learnt so far

STEP ONE: TEXT FEATURES – *skim and scan your reading and write down any text features that you might see and the information they give you about the text*

INFERENCE: write down what you think the text is going to be about based on these text feature clues

STEP TWO: QUESTIONING – *based on what you think the text is going to be about, write down two or three questions that you want to answer by the time you've finished reading today*

STEP THREE: INFERENCING – *look out for ideas that aren't specifically in the text and write down the clues that led you to think that idea*

STEP FOUR: SUMMARISING –*Summarise the main idea of what you read today and the answers to your questions*