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AN INVESTIGATION INTO THE EFFECTS OF RECIPROCAL TEACHING INTERVENTION AS A MEANS OF DEVELOPING THE AT-RISK PRIMARY STUDENT'S READING COMPREHENSION AND METACOGNITIVE SKILLS, MEDIATED BY MOTIVATIONAL VARIABLES

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A thesis submitted in fulfilment of the requirements for the degree of

Master Of Education

Faculty of Education

University of Sydney

FEBRUARY, 1998

ABSTRACT

This study is an investigation into the effects of reciprocal teaching intervention as a means of developing reading comprehension and metacognitive skills of at-risk primary school children, concomitant with increased motivation for attempting and sustaining on-task behaviours in relation to reading comprehension activities and active participation in the classroom.

The study, in its successive phases, used complementary quantitative and qualitative research techniques to describe and analyse developments in reading comprehension monitoring and fostering skills, motivational patterns and participation styles within the classroom. Pretesting and post testing measures quantitatively measured reading comprehension skill developments, changes in motivational patterns, and participation in the mainstream classroom. The results showed significant improvement in both ET/RT and RT only reading comprehension fostering and monitoring skills. This improvement was maintained after a period of six weeks with no continued intervention. The ET/RT group did not improve at a greater level than the RT only group on daily reading assessments but did however manifest a more dramatic improvement on the standardised reading test compared to a modest improvement made by the RT only condition. Furthermore, the ET/RT group maintained improvement at a higher level than RT only over a six week period.

Qualitative analysis of students' reciprocal dialogue transcripts showed that both the ET/RT and RT only groups were applying the four metacognitive strategies to reading texts. The ET/RT group tended to use more 'thinking' questions in order to gain a deeper understanding of the reading material. Both groups found some difficulties in formulating summaries with RT only groups able to identify the summary more easily when the summary was essentially inherent in the text. The study found increased

intrinsic motivation in the RT only group and increases in both identified and introjected motivational patterns for the ET/RT group. Finally, some improvement was made for both the ET/RT and RT only groups on the four behaviour participation scales of effort, compliance, initiative and participation. Implications of the results of the study for future research and teaching were considered.

ACKNOWLEDGMENTS

This thesis is the result of work undertaken over several years, with the guidance, patience and assistance of my family, friends and supervisors, notably Dr Richard Walker and Dr Ray Debus. Dr Debus has provided a great deal of guidance and support over the years, of which I am very grateful. Dr Mike Bailey and Helen Watts were responsible for guiding me through data analysis. Patience and assistance has come from my family, particularly my parents Mary (Sean Ban) and James Latimer, my children Tom and Sinead and my work colleagues and principal John Emmett of Beverly Hill North Primary School, each of whom has endured times when my mind was on the research being conducted or on the writing of the thesis, rather than on any other task. To all of these people I extend my heartfelt thanks.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE.

AN INTRODUCTION TO THE STUDY

The At-Risk Student In The Primary School Setting

Students at-risk of academic failure have been increasingly identified as having limited metacognitive and cognitive skills. A plethora of teaching techniques exist which attempt to close the widening academic gap between the at-risk and mainstream students.

The focus of this study is to facilitate reading comprehension skills in the academically at-risk primary grade student. Recent research on the development of reading comprehension skills has changed from a focus on *what* to learn to a major focus on *how* to learn. Metacognitive and cognitive skills facilitating development of reading comprehension are receiving substantial attention and ways of enhancing such skills are increasingly being explored. This change of focus has been accompanied by methodological changes in data analysis techniques, and the resulting research has identified a range of important new research findings and problems.

Specifically, this study examines whether the student who is at risk of academic failure develops reading comprehension fostering and monitoring skills, increased motivation and active class participation when experiencing a reciprocal teaching approach. By using the reciprocal teaching format the study pursues the question of whether this particular form of teaching affects the at-risk student's motivational pattern which is purported to be an important characteristic of successful student learning and also a significant component of metacognitive process.

Context Of The Present Study

This study has been conducted in the context of continuing concerns by governments and the community in general over the high dropout rates from secondary education (Constable & Burton, 1993). It has been estimated that twenty per cent of Australia's children leave primary school with inadequate literacy skills (House of Representatives Standing Committee on Education, 1992). The result for the child is low self-esteem, poor employment prospects, difficulties in performing such everyday activities as banking, and reading a bus timetable. The wider implications of poor academic success are the perpetuation of poverty, frustration and alienation from society. All of these factors can be precursors to criminal behaviour (Constable & Burton, 1993). In Australia concern about students leaving school early without adequate literacy skills has resulted in federal government allocating additional funds for prevention schemes, mainly targeted at the primary school level through the employment of support teachers for students with learning difficulties (S.T.L.D.). In view of recent funding limitations, leading to S.T.L.D. teachers working on a part-time basis and increasing government focus on enhancing literacy skills, an approach which meets the academic needs of at-risk students and is relatively inexpensive is urgently required. One such approach is reciprocal teaching.

In this context, the further study of the sorts of research questions and issues referred to earlier take on an added urgency. It is vital that research questions relating to the development of metacognitive skills and motivation in the at-risk student continue to be the focus of sustained research efforts aimed at highlighting the problems and suggesting ways of improving academic attainment so that eventual dropout rates will be reduced.

Nature Of The Problems Being Investigated

Research indicates that at-risk students receive too much drill and too little opportunity to conceptualise and to apply concepts (Peterson, 1988). In addition the at-risk child's curriculum is less challenging and more repetitive. Teachers are more directive, breaking each task down into smaller pieces, walking students through step-by-step and leaving them with less opportunity to exercise higher-order thinking skills (Means & Knapp, 1991). This form of teaching leads to a widening of the academic gap, at a time when metacognitive and cognitive strategies are required more and more as the child progresses through upper primary and high school. Specifically, the study examines the way in which an at-risk student optimises his or her reading comprehension monitoring and fostering skills; develops and maintains motivation to tackle and then remain on-task and how this student plays a more active role in the mainstream classroom. Thus efforts to improve the quality of student learning need to focus on how the student is learning and gaining understanding from the text and how this can be improved, rather than focussing solely on improving mechanical learning through 'drill and practice' skills.

The issues of how can we facilitate comprehension fostering and monitoring skills in the often unmotivated, at-risk student and help them maintain these skills together with more active participation in the mainstream classroom, form the focus of the present study. These issues are explored, in this instance, by studying how students develop metacognitive and cognitive skills in reading comprehension through a reciprocal teaching approach, and how motivation affects the development and appropriate use of metacognitive skills.

Outline Of The Study

Sixty-six at-risk students, all identified as having reading comprehension problems, were randomly assigned to one of two training conditions or to a control condition. The two instructional groups were (1) reciprocal teaching of four reading comprehension strategies only and (2) reciprocal teaching of four reading comprehension strategies preceded by explicit teaching of metacognitive strategies one week prior to reciprocal teaching. The control condition comprised pre- and posttesting only, but no actual reciprocal teaching. For the two experimental conditions, students were withdrawn in groups of five and six and following the reciprocal teaching sessions were given a short text with ten questions to answer individually. Feedback was regularly given in the form of a graph and verbal guideposts. Pre- and posttest data collection comprised standardised testing, questionnaires (for both teacher and student), and transcript analysis.

Intensive analyses of the transcripts taken from three sessions for each experimental group were aimed at analysing the relationship between reciprocal teaching and its encouragement through peer discourse focussed around four comprehension strategies of reading comprehension fostering and monitoring skills. Quantitative and qualitative research techniques were employed to provide complementary data and insights concerning the processes and outcomes of the intervention. The quantitative techniques were used to obtain information about students' reading comprehension knowledge, motivational patterns and levels of participation in the mainstream classroom, the categories of description of which can to a large extent, be determined before collecting the data. Qualitative techniques allow for the collection of data from the perspective of the student in a situation in which appropriate categories emerge from the data rather than being determined beforehand. Taped transcripts of reciprocal dialogues formed the basis of the qualitative analysis in the present study.

By combining quantitative and qualitative techniques as Entwistle and Ramsden have noted (1983), a fuller and more convincing explanation of student learning is more likely to arise rather than when either technique used alone, as insights gained from each technique are not reducible to or derivable from the other.

Structure Of The Thesis

The issues raised in this introduction are analysed in detail in reviewing the literature on at-risk students and their associated motivational patterns, reading comprehension skills as related to the use of metacognitive and cognitive strategies and recent research literature on reciprocal teaching as an effective teaching platform from which to promote successful reading comprehension. Beyond these effects, reciprocal teaching is suggested in the present study to promote active participation in the mainstream classroom which is a critical factor in the at-risk student becoming a productive class member.

Chapter 2 provides a composite account of the primary grade at-risk student and emphasises what is needed in order to diminish the widening academic gap. Chapter 3 examines recent research into metacognition and motivation and how this is related to reading comprehension and reciprocal teaching. Recent research on adapting reciprocal teaching to the mainstream classroom is also discussed as well as successful alternatives to the reciprocal teaching model. The chapter finishes with a focus on future research issues. Chapter 4 reports the design and implementation of a program of reciprocal teaching and reading comprehension for at-risk learners. This chapter also includes an outline of the main hypothesis tested in the study.

The methods and procedure undertaken in the present study are described in Chapter 5. In particular the intervention is described in relation to similar reciprocal

teaching formats outlined in the metacognitive training literature. Additional features added to the reciprocal teaching format used in the present intervention are also discussed in the light of recent empirical research. Internal and external validity measures are outlined and are discussed in association with this study. Data collection strategies and instruments used in the investigation are delineated.

In chapter 6 the results from the reciprocal teaching intervention with academically at-risk students are organised around four main hypothesis which were presented in chapter 4. The main focus is on the effects of two types of reciprocal teaching (explicit teaching before reciprocal dialogues and reciprocal teaching only) on at-risk students reading comprehension skills; reciprocal teaching and its hypothesised effect on motivational patterns; reciprocal dialogue with peers as an hypothesised factor in increased class participation; and the maintenance of reading metacognitive and cognitive strategies in the longer term. Possible problems are considered and analysis of some of the implications of the study for further research and teaching. Final conclusions of the study and implications for future research are made in Chapters 7 and 8, based upon the interpretations developed in Chapter 6.

CHAPTER TWO.

READING COMPREHENSION AND THE AT-RISK STUDENT

This review of the literature on the failure of many academically at-risk students to develop effective reading comprehension fostering and monitoring skills focuses on recent approaches and findings. In developing a rationale for a study of at-risk student learning of reading comprehension skills at the middle primary grade level, the review concentrates on recent studies at that level. The major issues in the reviewed research and the substantial gaps revealed in this analysis provide the source of the major questions addressed in the study. These questions are identified during the review and are summarised in the final section.

Factors Which Contribute To The At-Risk Student's Low Achievement Levels In Reading Comprehension

A major cause for concern for educators and the wider society is the consistently low reading achievement levels experienced by the academically at-risk primary grade student. A lack of metacognitive and cognitive strategies, extrinsic motivation levels and limited prior 'school' knowledge (Stein 1989) are seen to affect the development of reading skills. It is also argued that critical school variables (for example, the nature of the tasks presented, teaching format and approach) adversely affect the at-risk student in developing deeper understanding of what he or she is reading and subsequently these school variables provide an obstacle to successful reading skill attainment.

The nature of the task given to the academically at-risk is a salient contributing factor in reading failure in that learning for these students mainly focuses on basic skills training

without opportunities to develop metacognitive strategies. This is further compounded by teaching techniques which emphasise total teacher control and direction of learning content concomitant with passive student learning (Padron, 1991).

Specific school variables have been identified which can affect the at-risk student's success at reading to understand. If the at-risk student is to develop strategies which provide an effective way in which to study the text, then this student who often avoids tasks needs first to begin with developing on-task behaviours and sustaining effort when the task becomes more challenging (Kagan,1990), especially when skills are initially limited and significant effort is required to understand and complete the set task. Hence, motivation is a key factor in experiencing reading success, enabling a student to remain on a reading task when it requires sustained effort and to repeatedly try using a learned strategy until successful. Increased internalisation of identified and introjected motivation may be developed through reciprocal teaching with its opportunities for peer assistance, scaffolding, student autonomy, active participation and ownership of learning experiences (Deci et al, 1991).

Several classroom factors affect motivational patterns and student participatory levels which have a direct effect on reading comprehension fostering and monitoring skill development (Finn,1989). Peer isolation has a critical effect on student participation leading to increased extrinsic motivation levels. Negative labelling by teachers and peers, together with low teacher expectations can also contribute to extrinsic motivation and student passivity in the classroom. Enhanced motivation can also occur through consistent teacher warmth, support and feedback.

Increased opportunities for reading success can be effectively sought through teaching explicit metacognitive and cognitive strategies. Ghatala et al (1986) suggest that explicit, overt instruction regarding what a strategy is, why, when and where to use

metacognitive strategies is a critical factor when attempting to increase low achievers' reading skills. They argue that explicit instruction is an effective factor in reading comprehension because it provides clear, accurate information about how to perform a strategy and its relationship to successful reading performance. At-risk students are the most in need of cognitive training (Stein, 1989) and yet are largely taught implicitly, if at all.

Reading Comprehension And Task Quality

Good comprehenders read to learn in that they read to acquire content knowledge that they do not as yet have. Poor comprehenders on the other hand, cannot adapt effectively to totally unfamiliar texts. Research on the development of reading comprehension skills is increasingly focusing on students' quality of thinking and understanding of the reading text they are studying and the cognitive strategies used to aid in successful learning. More able readers employ a diversity of strategies which are often effective and appropriate. Specifically, more able readers are skilful at differentiating the importance of individual ideas in text and identifying main ideas (Grabe & Dosmann, 1988). Less able readers often engage in 'mindless' reading and often fail to monitor comprehension (Osman & Hannafin, 1992). The acquisition of comprehension skills Osman and Hannafin contend, is influenced by the degree of overlap between the reader's prior knowledge and the content of the reading material. Recurrent experience of failure in attempting to read and understand the text results in the 'Matthew Effect' according to Stanovich (1986). The negative aspects of the Matthew Effect are associated with students who regularly experience failure at set tasks in a particular academic domain and this continuing sense of failure leads to feelings of low self-efficacy and self-esteem in succeeding at any academic task across the subject areas. Hence failure in one area imbues the student with a sense of learned helplessness for other cognitive tasks, thus leading to increasingly global performance

deficits.

The present study focuses on students who regularly experience reading comprehension fostering and monitoring difficulties at the middle primary school level. These students are at risk of academic failure. At-risk students have few, if any, metacognitive and cognitive strategies to assist them in gaining a deeper understanding of the reading text (Means & Knapp, 1991) and also possess limited prior 'school' knowledge (Stein, et al 1989) which is often linked to experiential and academically deprived home situations. The academic needs of the at-risk student may be effectively met through reciprocal teaching with its emphasis on explicitly conveying metacognitive and cognitive reading strategies which are made more meaningful by tapping into and expanding the student's prior knowledge base and experiences.

The majority of at-risk students experience remedial assistance and not preventative measures as a means of increasing reading comprehension skills. In this study remediation and not prevention of reading failure is the focus. Remediation up to date in most primary schools comprises students being withdrawn from the mainstream classroom into support groups for students with learning difficulties which emphasise teacher-directed learning of 'basic reading skills' through drill and practice sessions in which the student takes on a rather passive role. Students in these government-funded remediation classes are still significantly falling behind their mainstream counterparts in the development of literacy skills.

The quality of the reading task and how it is communicated are of paramount importance irrespective of whether the student is withdrawn or involved in the mainstream classroom (Archambault, 1989). A key area which affects the at-risk child's reading achievement and motivational levels, is the type of academic task

given. The actual nature of the task (isolated skill development without active participation and metacognitive components compared to tasks which expound explicit teaching of metacognitive and cognitive strategies with active student involvement); the manner in which the task is set (stencilled worksheets encompassing drill and practice format devoid of non-literal questions or higher order thinking situations) and the way in which the task is communicated within the classroom setting (tendency to centre mainly on teacher modelling of the concept with little student interaction and passive practice of concepts) directly influence the at-risk student's attainment of reading comprehension skills. Concerns are growing regarding the efficacy of direct instruction (as defined by Brophy, 1988) and its relationship to the learning of higher-level cognitive skills, such as reading comprehension (Peterson, 1988). Direct instruction as presently described emphasises predominantly teacher direction and passive learning. The concept being taught is often simplified and taught in isolation, step-by-step with little or no opportunity for student interaction. Once the concept has been modelled and questions asked, students attempt practice examples on stencilled worksheets. Research indicates that at-risk students receive too much drill and too little opportunity to conceptualise and to apply concepts in both mainstream and withdrawal classes (Peterson, 1988). This leads to less challenge, and motivation is adversely affected. How can quality of task be ensured? Reciprocal teaching is presently advocated as a teaching approach that requires active dialogue within a small group directed at joint text reconstruction and hence a deeper understanding of a reading task. Initial teacher modelling leads to students taking over the teaching process in a turn-taking procedure with the teacher acting as a coach and as a source of constructive feedback, rather than being the sole owner of the learning procedure. Emphasis is placed on students' own thought processes (metacognitive strategies) developed through coping peer modelling and interaction, enabling the student to work at his or her own pace which in turn assists in gradual student autonomy and active student participation. This form of teaching contrasts sharply with direct teaching, the

contrast mainly occurring around the level of student participation (active versus passive participation) and student autonomy versus teacher control. Reciprocal teaching encourages active and not passive student involvement. Furthermore, reciprocal teaching emphasises student empowerment in that students gain control over their own learning, which is facilitated by their developing metacognitive and cognitive strategies that are modelled and applied to meaningful and moderately challenging tasks and not isolated skills practised mechanically by means of stencilled worksheets.

Reading Skill Attainment And The At-Risk Student

An overemphasis on basic skills training devoid of possibilities to enhance metacognitive skills is seen as a major contributing factor to progressive academic failure (for example, Pogrow, 1990). An assumption underlying much of the curriculum is that certain skills are basic (i.e. phonetics, mechanical maths) and must be mastered before moving on to higher order skills such as comprehension, written composition, investigative maths (Means and Knapp, 1991). Research indicates that at-risk students receive too much drill and too little opportunity to conceptualise and to apply concepts (Peterson, 1988). The at-risk child's curriculum is less challenging and more repetitive. Teachers are more directive, breaking each task down into smaller pieces, walking students through step-by-step and leaving them with less opportunity to develop and exercise metacognitive skills. This leads to a widening of the academic gap, when metacognitive and cognitive strategies are required more and more as the child progresses through upper primary and high school. It is important to note, and as Means and Knapp (1991) emphasise, teaching metacognitive strategies from the beginning of a child's education does not mean failing to teach those skills generally called basic. Rather, complex meaningful tasks are utilised as the content for instruction on both metacognitive and basic skills. For the at-risk student to achieve academically, it is presently suggested that a focus must be placed on tasks which are

moderately challenging and meaningful and which stimulate the development of metacognitive knowledge and cognitive strategies. The teaching approach will be most effective when it meets the needs of the at-risk student. It is argued that reciprocal teaching is the most effective technique for best meeting the at-risk student's academic and affective needs with its emphasis on active practising of metacognitive and cognitive strategies within a small group. A clear understanding of what constitutes an at-risk student is of paramount importance so as we can best meet their academic and affective needs.

Identification Of The At-Risk Student

An at-risk student is defined within the literature as a student who has low socioeconomic status (SES), a record of poor grade attainments, particularly in reading and mathematics, and is experiencing repeated course failures which may lead to non matriculation and hence premature dropping out of high school (Means et al, 1991). This definition however changes perspective as the child goes through school. While initial identification of the at-risk child centres around the child's low socioeconomic status (Fine, 1986; Madden et al, 1993), not all economically disadvantaged children drop out of school (Peterson, 1988), even though low SES is the premise on which most at-risk funding and much empirical research is based. As the child moves through the school system, low achievement (Brophy, 1988; Catterall, 1987) and grade retention (Haskins, 1989) become the key predictors of early school leaving. The catalyst, it is argued in the research literature, is an impoverished home life in the sense of economic hardship and experiential impoverishment, which leads to a lack of a prior 'school' knowledge base or school 'readiness' which is associated with an inability to 'read' the school culture. For example, students who are equipped with a school knowledge base before entering the school system have gained a familiarity with the enjoyment and purpose of a variety of reading texts. For instance, these

students often have an understanding of the narrative text form with the repeated written format comprising an orientation, complication and resolution of the complication and have a knowledge of various nursery rhymes (Padron, 1991).

Several characteristics when combined together often identify the at-risk child. They have different predictive value depending on maturational considerations and are influenced by situational variables. Coleman et al (1966), found that family background was the most significant factor influencing school achievement. Parents who had dropped out of high school, or have attained minimal educational qualifications, who are unemployed or have low levels of occupational attainment are all purported to affect negatively the child's achievement levels at school and increase the risk of premature school leaving (Rumberger, 1987). In addition, Young (1982) suggests that low SES children have a language structure which is incongruent with the middle-class style of communication evidenced in most schools and this may lead teachers to underestimate low SES students' ability levels, as it has been evidenced that teachers base their initial evaluations of students on the way they use language (Brophy, 1988). This communication-deficit may significantly affect development of metacognitive and cognitive skills, as parents then teachers offer limited opportunities in which to exercise these skills. Limited metacognitive skills restrict successful comprehension of reading material. It has also been found that low SES children come to school with fewer cognitive and metacognitive skills compared to their middle class counterparts (Means & Knapp, 1991). It is therefore vital that the at-risk student in particular is given explicit training in the use of metacognitive and cognitive strategies.

It is important to clarify the definition of at-risk specifically at the primary grade level as identification changes as the student moves through the primary and into the high school grades. What may be useful indicators in the early grades (e.g. low SES)

many not be sufficient means of identification in the middle primary grades. In addition, by arriving at a clear definition of the term 'at-risk', it will be shown that reciprocal teaching is potentially a highly effective remediation for middle primary grade students who are at risk of failing when attempting to close the academic gap. Pivotal to the definition of the at-risk student is the theoretical stance adopted concerning the at-risk child and the concept of learning deficits. One theoretical stance termed 'deficits-in-the-child' argues that some students arrive at school with learning gaps, in that their knowledge may not match that required in the classroom. Researchers adopting this position have argued that there is an overlap of characteristics between the learning difficulties, learning disabled and the at-risk students, and thus clear definitions of these terms do not exist (Court et al, 1990). As the at-risk child progresses through the primary school years, the academic gap between the child and his peers performing at the school norm increases. It is this particular identification of the at-risk child which is fraught with confusion and erroneous labelling (Stanovich, 1991). This child has been classified as a child of 'low ability' (Allington, 1991), and also as learning disabled (Bull, 1991). Although many researchers encapsulate this child under the rubric of 'low achiever' (Means et al, 1991), if at-risk is synonymous with learning disabilities, then why the need to create distinct categories? Are there distinct groups which share common characteristics, yet are different in critical areas?

A critical point which makes the generic terms of learning difficulties or learning disabilities inappropriate for the at-risk child, is the difference in actual IQ scores. Learning difficulties students have global, low IQ scores. In contrast, (Giorcelli et al,1991) suggests that the "at-risk" child from a low SES, attains global IQ scores which indicate that they are just below average, yet performs by third grade below the 25th percentile on standardised achievement tests (Madden et al, 1993). Are IQ tests a reliable criterion on which to distinguish the at-risk student, the learning difficulties

student and the learning disabled student? Stanovich (1991) argues that those parts of the IQ test that best discriminate between the L.D. and low achieving readers are those parts that are least related to reading failure. While both groups are poorer on the verbal subtests, the L.D. group are marked out by their better performance on the performance subtests, the subtests that have little predictive value, Stanovich argues, for academic achievement. A plethora of evidence is now accumulating to indicate that many factors previously thought to affect reading achievement are themselves affected by reading experience itself such as vocabulary growth and comprehension ability (Stanovich,1991). Stanovich postulates that listening comprehension skills are more appropriate indexes of intelligence. Poor listening skill development in first grade may lead to poor reading skills in later primary years (Brown & Campione,1990). Humphreys and Parson (1979) concur with the suggestion that listening comprehension is an indicator of later reading success and argue that by third grade, scores on standardised listening-comprehension tests are the best indicators of reading ability and that by fifth grade, listening-comprehension tests are highly effective predictors of academic success. The researchers suggest that listening comprehension is a useful predictor of later reading achievement for the primary grades only and that decoding ability is the most useful criterion for identifying potentially able readers in the infant grades, kindergarten to second grade.

It is argued that the at-risk child has limited reading experience (Allington, 1991; Calfee, 1991; Madden et al, 1993). Stanovich suggests that this points to deficits outside the child in the school system which affect cognitive skill growth. If deficits are attributed to school factors, and not to the child themselves, then do learning difficulties actually exist, or is this a convenient category in which students are placed when the lack of academic development is not clearly understood? There exists heated debate around the deficit-in-the-child and deficit-in-the-school theoretical standpoints. Slavin (1989) suggests that learning difficulties are quite uncommon. Indeed he argues

that every student is able to attain a basic skills level, and that no more than two per cent of the student population has learning difficulties per se. However, it is important to note that the at-risk student population, like any other special needs population, is not homogeneous. There are bound to be at-risk students with learning disabilities (intrinsic processing deficits, which often contribute to students having global, low IQ scores), or who are conversely, high achievers. The present study adopted the deficits-in-the-school position and attempted to remedy reading deficits specifically in the at-risk student population, eliminating learning difficulty and learning disabled students from the sample. Several characteristics emerge from current research literature as contributing factors to eventual dropping out of high school and are delineated in Appendix 1. At-risk students do not form a homogeneous student population and this heterogeneity of at-risk students resulted in students being identified in this study as being at-risk when they fulfilled 5 out of 8 criteria (refer to Chapter 4) drawn from the present characteristics delineated in the table.

Table 2.1. Characteristics Identifying The At-Risk Student

Home Factors	School Factors

Low socioeconomic status
Minimal parental qualifications
Parental unemployment
Parents who were high school
   dropouts
Use of the restricted language code
	Attending learning difficulties
	   support classes (S.T.L.D.)
	Grade retention
	Below average scores in Mathematics
	   and English
	Non-participation in class activities
	Limited metacognitive and cognitive
	   strategies
	Frequently isolated from peers
	Extrinsically motivated
	Average to high I.Q.
	High absenteeism rate
	Attend low ability classes for Maths
	   and English

Summary

The empirical research has focused on academically at risk students, from low socioeconomic backgrounds who approach school life for various reasons with limited metacognitive skills and negative affects (Means & Knapp, 1991). The main question pursued concerns at risk students not actualising their academic potential due to school variables. There is mounting evidence concerning the unrealised intellectual potential that at risk students possess. It has been established that low SES students come to school with knowledge (Means et al, 1991). To ignore this is to reinforce, and not minimise the educational disadvantage many students face. Thus, the goal of the process is not to change children so that they fit schools, but rather to change schools so that all children fit (Maehr & Midgley,1992). Changing the school system needs to begin with changes at the classroom level. There is a clear need for learning formats which encourage at-risk students to become involved, to develop metacognitive and cognitive strategies; opportunities to attempt moderately challenging tasks which are meaningful and tap into prior knowledge bases; techniques which emphasise peer-interaction, techniques which promote teacher support and provision of scaffolding until the student is able to be more responsible for their own learning. Hence, an emphasis must be placed on meeting the particular needs of the at-risk student through teaching metacognitive strategies and encouraging active participation which leads to increased motivation and perhaps successful comprehension. Reciprocal Teaching (delineated in chapter 3) includes these features with its emphasis on active peer collaboration and development of reading comprehension fostering and monitoring skills.

Reading Comprehension Skills Mediated By The At-Risk Student's

Motivational Patterns

Students have an inherent predisposition to be curious and motivated to learn about their surroundings. After the at-risk student enters school motivation levels are diminished and by the early primary years, extrinsic motivation levels are evidenced, (Deci et al, 1991), low self-efficacy (Schunk, 1989), negative attributional styles (Graham,1991) and limited metacognitive and cognitive strategies in the academic setting (Osman & Hannafin, 1992). At-risk students with extrinsic motivation patterns are characterised as students who frequently avoid tasks and when actually engaged in learning, give up easily when a deeper understanding of the text is required.

The intrinsic/extrinsic motivation dichotomy is viewed as simplistic in recent research by cognitive evaluation theorists such as Deci and Ryan (1990). It is proposed by Deci that motivation operates along a control-autonomy continuum. Some extrinsic motivation is also assimilated into the self and is subsequently an internal motivational state. Internal motivated states however, are not to be confused with intrinsic motivation. Intrinsic motivation is innate; internalised motivations are not. The common thread existing between the two, is a high degree of autonomy (self-initiation and self-regulation of behaviour). In order to be autonomous with respect to internalised regulatory processes one must fully assimilate them. There are three types of internalised regulation along the control-autonomy continuum. The least autonomous of the three is introjected regulation. If assimilation through interaction continues, one may identify with the importance of the activity for oneself and accept it as one's own. This is identified regulation and represents greater autonomy, hence a higher level of self-regulation.

Integrated regulation is the most autonomous motivational style in which regulatory

processes coexist harmoniously. Integrated regulation is still extrinsically motivated because of its importance for achieving personal goals rather than because of its intrinsic interest. Nonetheless it would be autonomous because it would be undertaken willingly. Students who develop more integrated motivational patterns tend to show increased interest in reading tasks. Furthermore, feelings of helplessness which are associated with the at-risk diminish, with students voluntarily responding to reading activities. Intrinsic and integrated motivational states are also purported to be associated with increased conceptual understanding (Ryan & Grolnick, 1984). Integrated regulation can be increased by perceived student autonomy, active learning, constructive and frequent teacher and peer feedback when engaged in a task. Even if at-risk students' motivation increases, Deci argues that the affects will be significantly decreased as they move through school due to classroom practises and students' perceptions of lack of autonomy.

A motivationally mature student is one who can set their own academic goals, identify and use strategies, correct ineffective strategies and make improvements in performance levels. A student who is low in motivational maturity needs a great deal of structure, task organisation, direction, teacher monitoring. To move from low to high motivational maturity the teacher needs to teach the student how to think strategically by teaching strategies of self-organisation, self-direction and self-monitoring and at the same time removing in small steps, the amount of teacher direction and monitoring (Ames, 1992). Emphasis on activating not only intrinsic motivation, but also the autonomous motivational behaviours (introjected, identified and integrated) is imperative in order to understand and enhance motivation in the classroom. By encouraging the at-risk student to act and perceive themselves as autonomous, educators will facilitate the development of well-adjusted, independent, active students who will in turn contribute effectively to society as adults. Reciprocal teaching has the potential of increasing the at-risk student's motivation when

attempting to understand a reading task through increased choice, active participation and self-responsibility for learning. In addition, reciprocal teaching is a suitable classroom learning framework as specific metacognitive strategies are taught and then used actively by the students through joint reconstruction of moderately challenging reading texts which require students acting as teachers and hence having choice and a sense of responsibility for their own learning.

Factors Which Affect The Development Of Intrinsic Motivation

Extrinsic motivation is linked to an external locus of control which in turn is associated with passive learning behaviours and low reading achievement levels (Rumberger,1987; Good, 1988). Superior achievement in reading comprehension on the other hand, has been linked to internal attributions for success (effort and ability), while poor performance has been associated with external attributions for success such as luck or task difficulty (Graham, 1991).

Extrinsically motivated actions vary considerably in their perceived locus of causality. Critical to the development of intrinsic motivation is the experience of autonomy. Events can have varying influence on intrinsic motivation by specifically affecting the locus of causality. Any event that promotes an internal locus of causality for an activity will tend to increase intrinsic motivation for that activity (Deci et al, 1989). Events that contribute to a perceived external locus of causality for an activity will tend to decrease intrinsic motivation. A perceived external locus of causality emphasises the attribution that external factors such as rewards or constraints were the source for initiating behaviour and consequently self-determination is not experienced.

At-risk students who display extrinsically motivated behaviours (for example, task avoidance, insufficient effort and interest) may have in fact an unknown locus of

control in the sense that they don't actually know why they regularly fail at reading tasks. Butler and Orion (1986) suggest that students may cite luck as a reason for success or failure when they actually mean they do not know why and further hypothesise that unknown control would be expressed more often by at-risk students. This may indicate that at-risk students have learned that there are no clear reasons for their own outcomes, a perspective which will subsequently have a detrimental effect on achievement levels. Unknown control is consistently associated with poor achievement levels. In a study by Connell (1985), high unknown control for academic outcomes among primary school students was associated with low achievement levels, negative perceptions of competence, extrinsic motivation and low autonomy. The development of metacognitive strategies in combination with increased motivation as emphasised in reciprocal teaching will perhaps enable the at-risk student to have more control over academic outcomes (Carr & Borkowski, 1989; Pressley et al, 1992). Recent research has arrived at similar findings when investigating external locus of control and strategy instruction. When strategy attributions are emphasised, according to Garner and Alexander (1989), the locus of control will shift from external to internal when the student is encouraged to shift his or her perception of task failure to inadequate effort of the wrong strategies rather than to ability.

Unknown control is also associated with low self-concept and has negative affects on questioning and help-seeking in the classroom. The at-risk students are often passive learners and thus unknown control will critically affect learning. Reciprocal teaching can specifically meet the at-risk student's need for control over their own learning by students assuming the role of teacher and having a sense of autonomy in the learning process and through active group participation which decreases extrinsic motivation and helps foster an internal locus of control.

Attributional retraining could affect reading performance by changing the at-risk

child's beliefs about the usefulness of reading strategies in performance. Schunk and Rice (1987) found that strategy attributions increased task performances of remedial readers. They suggest that the linking of the use of strategies and increased effort with success needs to be emphasised by the teacher. Young children attribute success outcomes to effort, while older children develop a concept of ability as an explanation for performance differences. This would suggest that by the time the child reaches the middle primary grades, attributions for effort linked to successful outcomes may not be a satisfactory attribution for equipping the child of low achievement levels for consistent academic success. Indeed if the student fails after trying hard, then this may have long lasting effects on motivation (Bruce & Chan, 1994). Strategy attributions have been identified as factors which contribute to the use of strategies. Little research has been done on the development of attributional beliefs and the use of strategies (Chan, 1994). In the case of academically at-risk students the value and use of a strategy may be the salient metacognitive factor. Reciprocal teaching with its recent focus on teaching explicit strategies together with effort attributions through an active, autonomous learning framework is more suitable for the at-risk student who often has limited metacognitive and cognitive strategies and negative motivation patterns.

Perceived competence also affects intrinsic motivation. An event that increases perceived competence will tend to increase intrinsic motivation, while those that diminish self-competence will decrease intrinsic motivation levels (Deci, 1991). When the classroom provides positive, constructive feedback on task-related performances as in the use of reciprocal teaching technique, intrinsic motivation will be enhanced. Negative feedback through critical messages will diminish intrinsic motivation.

Enhanced self-efficacy has a direct influence on the type of goal setting chosen by a student, which affects reading comprehension levels. Many high achieving students appear to set proximal goals for themselves, which they further break down into

manageable substeps. The low achieving, at risk student tends to set nebulous, distal goals which impede the learning process (Schunk, 1989). Schunk argues that it is possible to teach proximal goal setting with regard to reading skills to at-risk students, which in turn enhances their self-efficacy, achievement motivational levels and use of metacognitive and cognitive strategies. Specifically, enhanced self-efficacy (for goal attainment) will facilitate students' use of previously taught strategies. This was supported in a study by Schunk and Rice (1987), in which remedial readers were taught a direct strategy to answer reading comprehension questions. Self-efficacy for goal attainment contributed to higher levels of achievement outcomes.

In summation, high levels of motivation are critical for the development of reading comprehension skills and a teaching format which fosters motivation is thus of the utmost importance. Reciprocal teaching emphasises proximal, group set goals and subgoals through joint construction of a text, which will particularly enhance the at-risk student's motivational level and thus will be linked to the successful development of reading skills.

Classroom Factors Linked To At-Risk Students' Low Levels Of Reading Comprehension Attainment

The at-risk child does not exist within a social vacuum. Indeed, factors within the school and the classroom act on the at-risk child and contribute to the formation of a discrete subculture that is incongruent with academic success (Kagan, 1990). In considering what happens in the classroom, for at-risk children to become progressively alienated, unmotivated and to become low achievers Kagan (1990) identifies three main factors that may contribute to students becoming at-risk of academic failure: (a) peer isolation (b) teacher expectations and (c) labelling.

At-risk students often assume a passive role in class, withdrawing from class activities. In order for a student to remain in the school system, the student needs to actively participate in school relevant activities. The failure of a student to participate in school and class activities or to develop a sense of identification with school, may have significant negative consequences (Finn, 1989). Finn argues that the participation-identification model of the at-risk student, which espouses a developmental perspective, serves as an effective means by which to explain the high school dropping out action taken by a significant number of students. Research on dropping out of school has emphasised the individual characteristics (e.g. low socioeconomic status (SES) and high rates of absenteeism from school) that correlate with the actual dropping out of the student. Dropping out, argues Finn, needs to be viewed from a developmental perspective that may begin in the earliest grades. Finn also suggests that there is a need for further research in manipulating modes of school participation.

The 'participation-identification model' emphasises bonding with school and when this does not happen, dropout will eventually occur. A key issue is getting the at-risk student productively involved in classroom activities, that is becoming an active participant in their own learning. Academic success according to Finn, (1989) is an important factor in assuring identification with the school process. Finn and Cox (1992) found that active student participation is associated with academic achievement. They explored the relationship between participation or nonparticipation among fourth grade students. Three groups emerged, active participants, passive participants and nonparticipating students. The groups were compared on demographic characteristics, attendance, achievement and self-concept for the preceding three years. Participation groups were clearly distinct on the achievement measures since the first grade and they maintained those distinctions over time. The researchers suggest that students who withdraw from participation in the classroom need to be identified at the earliest possible time to attempt to avoid the harmful effects that may occur.

Two aspects of participation are of critical importance, namely responding to the requirements of the class and teacher and taking an initiative with schoolwork, which contribute to the child's academic achievements, particularly in primary and into high school. At-risk students frequently develop negative participatory roles which are often linked to peer isolation and the child's negative motivational patterns. The at-risk student may present him or herself as passive in the classroom because he/she cannot 'read' the structure and requirements of the classroom (Kagan, 1990). It is difficult for these children to exhibit a high degree of involvement in learning when most of their learning centres around basic skill development and direct teaching strategies which do not require much involvement (Means & Knapp, 1991). These children are often not encouraged to become willing participants by parents or teachers (Brophy, 1988).

Labelling theory has been used in an effort to explain the formation of student subcultures in the classroom. Teachers seek to understand their students, it is stipulated, by naming them and the categories these names create are evaluative (Kagan, 1990). At-risk students often perceive teachers as involved in the process of negative labelling (Catterall,1987). In addition, those at-risk students who are negatively labelled, are deprived of necessary motivation and assistance which is critical to task engagement and persistence (Kagan, 1990). It has been suggested by Good (1988) that students get locked into specific negative behaviour to which the teacher possessing low expectations reacts negatively and then a detrimental cycle is established. Research is unclear on who initiates the cycle, but there is wide agreement on the existence of this negative cycle.

To compound the problem further, Kagan argues that the school socially isolates at-risk students within a peer subculture that is openly hostile to academic learning. She further suggests that ability grouping and tracking serve only to consolidate such peer groupings so that students in high track tend to remain on-task, whereas students in

low track classes engage in non-productive conversations (Good & Marshall, 1984; cited in Kagan, 1990). By providing a framework where the student learns from coping peers initially and then when equipped with metacognitive strategies that they use to make contributions to the group's understanding of the text, teacher and peer negative labelling may be significantly reduced as students are learning actively together. It is hypothesised that teachers have differential standards and expectations for students whom they regard as being at risk of academic failure. It is proposed that teachers communicate these expectations to at-risk students through verbal and non-verbal behaviours, the nature of academic tasks, and the use of stable ability grouping (Kagan, 1990). Negative teacher expectations it is argued by Good (1988), contribute to at-risk student passivity in the classroom. In particular Good suggests that negative teacher expectations are expressed by teacher behaviours such as: waiting less time for low achievers; rewarding inappropriate behaviour or incorrect answers by low achievers; criticising low achievers more often for failure; praising low achievers less frequently than highs for success; failing to give feedback to the public response of low achievers; paying less attention to low achievers or interacting with them less frequently; calling on low achievers less often to respond to questions; seating low achievers farther away from the teacher and demanding less from low achievers. He further suggests that if the teacher treatment is consistent over time and if students do not actively resist or change it (which may be unlikely in view of the at-risk primary child tending to withdraw from class activities, Kagan 1990; Finn & Cox 1992), it will probably affect their self-concepts, motivation, levels of aspiration, classroom conduct, and interactions with the teacher. The focus needs to be on the empowerment of the at-risk student by encouraging autonomous learning. Reciprocal teaching emphasises the gradual relinquishing of teacher control so as the teacher assumes the role of coach and the gradual development of active student learning.

Positive teacher expectations can promote learning (Good, 1988). Positive teacher

expectations are significantly influenced by the teacher's sense of self-efficacy. If the teacher possesses a high sense of self-efficacy, then this teacher will likely hold the belief that a student with lower skills is teachable, and subsequently will present more challenging experiences for the student, and attempt to maintain the child's interest (Good,1987). In contrast, teachers with low self-efficacy tend to de-motivate at-risk children, by low expectations, and a fear of loss of control if the child is allowed to freely participate in class discussions (Cooper, 1985, cited in Good, 1987). Teachers who are involved in reciprocal teaching may develop a higher level of self-efficacy through positive learning focusing on scaffolding, praise and constructive feedback (Brown & Campione,1990). In the Palinscar and Brown study two (1984), teachers with a degree of skepticism regarding their student's ability to participate competently in reciprocal teaching changed to a more positive expectation of these underachieving students. These teachers were pleased with the students' oral and written comprehension skills.

The classroom teacher's view on whether ability is an inherited trait or amenable to educational experiences influences teacher self-efficacy. Some teachers view intelligence as a fixed entity, while others see it as changeable (Marshall & Weinstein, 1984; cited in Good, 1987). A teacher's expectation level will be directly affected. If a teacher perceives ability to be fixed, then he/she may reinforce low expectations for students who are not performing satisfactorily, as according to this view no outside intervention will facilitate learning. Again, reciprocal teaching may reduce the negative effects of low teacher self-efficacy by gradually encouraging students to take responsibility for their own learning and with teachers acting as coaches, guiding student learning, teachers with low student expectations will not have such a pervasive influence.

Several main factors have been identified in the wider school community as having a

positive affect on at-risk students. Downing in a 1994 study found that teacher warmth and support, positive expectations and teachers skilled in counselling techniques facilitated at-risk students experiencing academic success. Downing emphasised the critical influence that the classroom teacher and wider school staff have on the at-risk student's attitude toward school in general, (Downing,1994). In Downing's study high school seniors from thirteen schools responded to a questionnaire concerning reasons that they stayed in school rather than dropping out. The results argues Downing suggest that teachers and the wider school personnel manifested specific behaviours (warmth, interest, positive expectations) that were conducive to keeping potential dropouts in school. Downing also suggests that specialised teacher training is required so as to more appropriately meet the academic and affective needs of the at-risk student. It is further suggested that recognition of the school climate, an effective and caring staff and energetic and experienced teachers trained in various counselling skills provide more promising remediation of the at-risk student than attempting to address the at-risk student's welfare within the confines of the classroom. Recent research into the affects of the wider school community concurs with Downing's findings. Lamperes (1994) in his study investigated the at-risk student as being part of a wider school community. Lamperes argues that classroom remediation strategies will be greatly diminished if the wider school climate is not addressed. Lamperes found that a Colarado high school significantly increased its effectiveness after its staff became committed to creating an intimate, nurturing environment for students. Achieving the objective comprised teaching students prosocial skills, creating a culture fostering positive relationships and cooperation, (i.e. teaching conflict-resolution techniques, reflecting on teacher expectations of students) and empowering students to own their own learning, to become responsible learners.

Reciprocal teaching may assist at risk students in becoming active learners with its focus on joint reconstruction of reading texts so as to develop comprehension fostering

and monitoring skills. Each student is encouraged to engage actively in tasks through discussing and putting into practise specific metacognitive strategies with small groups of peers and with taking the role of teacher when required. Each child has a turn in being the 'teacher' by summarising the reading material, perhaps opening a discussion by asking questions appertaining to the text and predicting future events. Hence, by taking more responsibility for their own learning, at-risk students become actively involved in developing reading skills. Negative teacher expectations and peer labelling are also likely to be reduced through reciprocal teaching. Peer collaboration, more autonomous learning and student empowerment will minimise the influences of negative teacher expectations and peer labelling. Positive learning experiences may be minimised, however if the wider school staff does not promote consistent positive expectations, warmth and support. In addition, reciprocal teaching encourages the at-risk student to become an autonomous learner and thus serves to empower them. By having the students learn within small groups, prosocial skills will emerge as students struggle with the reading material together and learn to communicate their ideas clearly with one another. Hence positive relationships and cooperation are a focal point in reciprocal teaching. Further research is required into the effects of the school community on the durability of skills obtained in successive reciprocal teaching sessions, such as reading comprehension fostering and monitoring skills, increased motivation and active participation in mainstream classrooms.

Reading Comprehension, Metacognition And The At-Risk Student

Metacognition, a concept with strong empirical and theoretical foundations primarily drawn from a cognitive-developmental perspective (Osman & Hannafin, 1992) emphasises the importance of instruction and learning processes. Within the cognitive framework it is proposed that children from poor and affluent backgrounds come to school with important knowledge and skills. One of the most crucial findings is that

prior knowledge is a critical determinant of learning (Jones & Friedman,1988). A well articulated knowledge base, it is argued (Stein,1989) is necessitated for enhanced strategy use. At-risk students are viewed as having an inadequate knowledge base in comparison to their age-related peers. Specifically, at-risk students have limited systematic structures of knowledge that can be used to explain and predict a wide range of phenomena (Schraw & Moshman, 1995). The particular language code (i.e. restricted or elaborated language styles) academically at-risk students have acquired may or may not match that of the classroom, but the intellectual accomplishment, a host of knowledge about the world, may be equivalent (Means & Knapp, 1991).

It is argued that unless the at-risk students are taught metacognitive strategies in the primary school years they will rarely ever develop these strategies (Schraw & Moshman, 1995) and thus they will experience failure when attempting the more complex task of reading comprehension. To teach metacognitive and cognitive skills, reshaping of the curriculum is needed whereby complex, meaningful problems and specific instructional strategies are emphasised. Further research is needed into how the knowledge base and strategy use can be developed in combination.

Explicit Teaching Of Metacognitive Strategies

This study emphasises that it is not the intelligence level of the child which is lessened, rather the child's ability to comprehend in the academic setting. A main assumption of this thesis is that at-risk students are not explicitly taught metacognitive strategies, whether in the mainstream or remedial classroom situation. Cognitive and metacognitive strategies (rehearsing, elaborating, organising, summarising, and self-questioning), it is argued, will facilitate the acquisition of knowledge, (Stein,1989). At-risk children are most in need of cognitive strategy training (Brophy, 1988), in contrast to their high achieving, more affluent counterparts who develop well-

functioning cognitive strategies and metacognitive awareness largely on their own. It is proposed that achieving children from more affluent backgrounds are able to 'read between the lines' and understand implicit metacognitive and cognitive strategies imparted incidentally by the teacher (Rohrkemper & Corno, 1988). Middle class children are taught skills of clarification, questioning and summarising before they enter the school system (Young, 1982). Swanson (1990) supports the need to develop metacognitive strategies in the low achieving child. Swanson found that high-metacognitive-knowledge/low-aptitude children perform significantly better in problem solving situations than low-metacognitive-knowledge children with higher overall aptitude scores. He contends that high metacognitive skills can compensate for overall ability by providing a certain knowledge about cognition. This knowledge Swanson asserts, permits low-aptitude/high metacognitive children to perform in ways similar to those children with high aptitude. Is it possible to teach explicit metacognitive strategies effectively to at-risk students in the mainstream classroom comprising thirty or more students with individual needs? The effects of high quality strategy instruction may be minimised in the mainstream classroom as at-risk students often feel lost in large groups within the classroom. This feeling of alienation experienced by the at-risk student may possibly be due to their 'omega like' status, negative teacher and at-risk student interactions, affective and motivational factors and to their general lack of confidence in asking for help.

The student is immersed in a complex social environment which also impacts on metacognitive processes (Paris & Winograd,1990). Students possess explicit and implicit knowledge of the classroom as a social community. In making metacognitive judgments, students view the teacher's effectiveness, authenticity towards the students, classroom discipline techniques and reasons for teaching an actual topic through previous experiences of teachers and judgments gained from home experiences (Ames,1992). Ames further argues that students' metacognitive judgments

are influenced by their perceptions of their peers and how well they are accepted as a member of the classroom. The classroom environment is particularly important when discussing the at-risk child as they are often as early as first grade labelled negatively by teacher and student alike (i.e. the 'omega-like' status) due to their restricted language code and lack of 'school' knowledge etc. They in turn view the teacher as a hindrance rather than aiding them in their learning, their peers as non-accepting, and form increasingly the feeling that they don't want to be there. They feel academically inferior and perceive themselves as social outcasts. In addition, in order to teach the at-risk child explicit metacognitive strategies the teacher must be aware of these strategies and indeed to assist at-risk students effectively in developing metacognition they must become strategic thinkers themselves (Pressley et al, 1992). Teachers are not given specific training in metacognitive and cognitive strategies and it is argued that they largely convey them, if at all, implicitly.

Summary

The obstacles for the at-risk child are two-fold; (a) learning to communicate in the elaborated language code and (b) attempting to understand implicit cognitive strategies. At-risk students metacognitive judgments are negatively influenced by classroom experiences. At-risk students require warmth, support, structured teaching, more encouragement and praise (Brophy, 1988). Many at-risk students do not participate in class discussion, do not ask for or receive assistance when required, while they experience low teacher expectations, drills and mechanical learning, and are often isolated from peers (Finn et al, 1989).

Preventing Reading Comprehension Difficulties

The major aim is to provide support for at-risk students so as to prevent the need for remediation of the at-risk student as much as possible. Madden et al (1993) argue that once students have fallen seriously behind, they are unlikely to catch up with their age appropriate peers, as the experience of failure introduces problems of low self-concept, poor motivation and low self-efficacy. The actual programs aimed at preventing the at-risk condition from taking hold, are largely aimed at the preschool, and/or kindergarten level. Primary and lower high school levels focus on remediation through special education, team teaching and counselling. For youth nearing the end of their high school life, vocational training becomes most effective. Haskins (1989) argues that preschool intervention programs provide an immediate boost to children's intellectual performance and reduce their rate of placement in special education classes as well as providing an enhancement of socioemotional development. However, these latter advances decline within a few years. One early intervention program entitled "Success for All" (Madden et al, 1993), combines prevention (high-quality preschool, kindergarten and beginning reading instruction), early, intensive intervention (tutoring for at-risk first graders, family support services) and continuous, maintenance interventions in grades 2-5 (cooperative learning, and direct instruction of basic skills). The model was aimed at keeping at-risk children in five primary schools, from kindergarten through to grade three, at the age-appropriate reading level (Madden et al, 1993). Attendance improved in all the schools, retention rates were at zero, reading success was established early and maintained itself, (especially for the lower 25 percentile achievement levels who maintained a 50 percentile achievement level). Achievement levels however were assessed by performance on basic skill measures. As the student progresses through upper primary classes, metacognitive and cognitive thinking skills are required to a greater extent. Further research is required to see whether the at-risk students in the Success For All program retained age-appropriate

reading levels in the upper primary years, when metacognitive strategies are emphasised. In addition, with global budgeting having a salient effect on programs selected for targeted student populations, financial cost is of paramount importance. King (1994) argues that when she compared three remediation programs for cost (Success For All, Accelerated Schools and School Development Programs), the Success for all was the most costly in expenditure. Thus questions are raised concerning the practicality of Success For All in the current economic climate. Perhaps further research is needed in how to modify the program so it is financially viable.

Present Reading Comprehension Remediation Strategies

Remediation and not prevention of the widening of the academic gap for the at-risk student is the focus of this study, as third and fourth grade students are involved, not preschoolers (Haskins, 1989). There are several frequently used remediation strategies connected with students who are at risk of academic failure including withdrawal, ability groups, and cooperative learning. Often students are withdrawn from class in small groups. The small group size is of benefit (Finn et al, 1989) but the quality of instructional material is often questionable (Means & Knapp,1991). It is presently argued that material and activities that develop metacognitive and cognitive strategies which are founded on prior knowledge bases will assist the at-risk child in closing the academic gap as well as enhancing self-concept and motivational levels (Stein, 1989). By contrast it is argued that drilling of isolated skills will actually widen the academic gap as well as further alienate the child.

Remedial Education As Designed To Assist The At-Risk Student In

Developing Successful Reading Skills

When remediation becomes the focus of facilitating the at-risk child's academic development, several methods can be employed. In the primary classroom, research has mainly centred around the pull out method (homogenous-ability classes of eight to ten students). The emphasis is on what the child lacks such as educational experience or family support (Means,1991). An underlying assumption exists in remedial education, in that by changing the method of instruction (to direct) and modifying the instructional materials (i.e. taped texts, games) learning will be enhanced. This has been challenged by many researchers (notably Miller, 1983, cited in Seidenberg, 1985; Waxman-Hersholt & Padron 1995). Despite many years of remedial education, at risk children fall further and further behind their more advantaged peers. The main drawback of remedial education is that this approach shifts the responsibility and focus for change from the student to the system and does not provide the at-risk child with the competencies they need to learn in order to cope effectively and independently with the demands of an instructional program. It is further argued that remedial education often encourages passive rather than active learning and may lead to inert knowledge structures (Schraw & Moshman, 1995). For the at-risk student to successfully understand reading texts, metacognitive and cognitive strategies must be explicitly taught drawing from moderately challenging and meaningful tasks. Reciprocal teaching with its focus on active learning of metacognitive strategies may help prevent the widening of the academic gap often experienced by at-risk students.

The at-risk child it is contended in the present study, needs to be temporarily withdrawn in order to activate the processes of metacognitive thinking. If the at-risk child is withdrawn at the primary level will this add significantly to the labelling process? As early as the first few weeks of kindergarten the at-risk child is labelled and

this omega-like status is only consolidated as the child progresses through school. Being withdrawn initially in order to learn to read for understanding via the teaching of explicit metacognitive strategies embedded in complex, meaningful tasks and the enhancing of motivational constructs, the primary grade at-risk student is more likely to eventually assume an active role in the mainstream classroom, develop social skills and positive motivation patterns and an enhanced ability to read the language of the classroom more adeptly. As Finn and Cox (1992) suggest, active participation and on-task behaviour is of great importance as it is linked to academic success right through to high school. However, there also exists a relationship between dropping out, attendance problems and disruptive behaviour in the classroom (Madden et al, 1993). Withdrawal from the daily classroom for student with learning difficulties support classes (STLD) may be correlated with the dropping out and chronic absenteeism displayed by the at-risk student. Withdrawal from the mainstream classroom will also be greatly affected by teacher expectations and the ego or task-orientated classrooms (Rohrkemper & Corno, 1988). Specifically, instructional strength is diminished in a classroom which instigates negative motivational patterns (Maehr, 1992). It is further proposed that reciprocal teaching by its very structure and the participatory involvement it requires, will enhance motivation and this enhanced motivation may be transferred to the classroom situation.

In the context of the current economic climate with global budgeting taking precedence in most schools resulting in many support services being severely curtailed so as they do not exist from fourth grade onwards, we may not perhaps have feasible alternatives to withdrawing the at-risk student in his/her primary school years. Quality intervention programs and teacher inservices on teaching metacognitive strategies particularly to the disadvantaged and remedial populations will be more cost-effective than most STLD (Students with learning difficulties support classes) programs run in public schools. The remedial education in the majority of primary schools tends to concentrate on basic

drill and practice with no attempt to redress the communication-deficit existing between these children and the middle-class school environment. This focus results in very little academic progress and may be a salient contributing factor in the eventual premature dropping out of many at-risk students (Waxman-Hersholt & Padron, 1995).

In addition, many classrooms are not equipped to manage small groups of primary grade students actively engaged in understanding reading texts. This is becoming a more pressing problem with the advent of composite groups, larger classes often exceeding thirty plus students, reintegration of students with special needs such as the partially sighted, behaviour problem and learning disabled students. Initial withdrawal of students may be required so as to promote the skills necessitated for the development of comprehension fostering and monitoring skills.

It is considered a successful educational practice, when at-risk students can make the transition from remedial class groups to the mainstream classroom. Fuchs et al (1993) investigated a process for readying students to make a successful transition from remedial classrooms to the mainstream classroom, entitled transenvironmental programming (TP). Fuchs and his colleagues view integration as successful when students had the academic and social skills required by the mainstream setting prior to re-entry into the classroom. Fuchs' finding that students' academic gains were evidenced in remedial class and not in the mainstream classroom, may lend support to claims that many mainstream settings may fail to accommodate student diversity. A six-week follow-up revealed that students subsequent to their transition into the mainstream classroom manifested no academic gain in regular education. This may lead to these children being placed again in remedial classrooms in the future due to insufficient performance. Replacement in a remedial classroom may have devastating effects on the already low self-esteem and negative motivation of the at-risk student. If metacognitive training was provided, this maintenance would have been perhaps more

durable. Reciprocal teaching integrates metacognitive training and motivation, which would, it is argued, promote higher levels of maintenance and thus reduce the chances of students returning to the traditional remedial classroom.

In the actual classroom setting, different groupings are often observed which have a direct influence on the at-risk child. One theoretical view is that ability grouping encourages at-risk subcultures (Kagan, 1990). Catterall (1987) found in his study that the at-risk student's perceived negative labelling by teachers was significantly higher than that of control group members, and their social bonding to teachers was significantly lower than controls. These children subsequently rely on each other for support. This may result in a cohesive peer group within the school, that looks to itself as a source of support, self-validation, and satisfaction in daily school life, but not to teachers or to designated school activities. This peer cohesion is made easier by ability grouping where most of the at-risk students are placed in the lower ability group. What is particularly disturbing is that these students rarely move to higher track ability groups once ensconced in the lower track groups (Hawkins, 1988). An alternative view is that streaming is beneficial for low ability children as it puts success within their reach, although (Slavin,1989) argues that research fails to support this. As noted previously, it has been shown that students in high ability classes work together on academic tasks, whereas their lower streamed counterparts engage more frequently in nonschool conversations (Good & Marshall,1984; cited in Kagan, 1990). In addition, streaming can result in lower self-esteem, lower expectations, isolation, dropout and school wide inequities which favour upper track students (Goodlad, 1984; cited in Hawkins, 1988).

Cooperative learning methods (students working in small mixed-ability groups to help one another learn academic material) it is argued, foster student achievement gains, positive affective and social outcomes as they bring heterogeneous groups of students

together in ways which leads to better attitudes and more cooperative interpersonal contacts between the at-risk and other members of the classroom (Brophy, 1988). Specifically, peer acceptance which is crucial for the at risk student's self-concept and social skills development, may be facilitated by cooperative learning methods as when cooperative learning has assisted in the acceptance of at-risk students into the class generally (Slavin, 1990). Low achieving students seem to benefit when they are placed in small, heterogeneous ability groups (Peterson, 1988). The case for cooperative grouping and the academically at-risk child is not clear cut. Slavin (1989) argues that for maths, within-class ability grouping is required for low achievers in order to facilitate academic achievement. However peer acceptance, which is crucial for the at-risk child's self-concept and social skills development, may be facilitated by cooperative learning methods. Cooperative learning has assisted in the acceptance of at-risk children into the class generally (Slavin, 1990). Rich and varied discussion is somewhat limited when the students are arranged in pairs (Padron, 1991), and those students who are reluctant to participate initially or who are novices learning from the expert will possibly experience fewer coping or expert models.

Cooperative groups need to be, certainly in the initial stages, continually monitored, reevaluated and modified when the at-risk child is involved as the at-risk student needs to learn new norms and social skills if they are to interact successfully in groups (Rohrkemper & Corno, 1988). Another salient limitation of cooperative learning methods is that they require the gradual transfer of work responsibility from the teacher to the students. This may lead to problems for teachers with marginal classroom management skills (Slavin, 1989). Further research is required into teacher skills when dealing with behaviour problems that may arise from teaching situations which are less structured and the major onus for learning is on the student themselves.

Summary

The at-risk student is labelled in the early school years by commonly used markers such as low S.E.S, use of the restricted language code and limited metacognitive and cognitive strategies (Paris & Winograd, 1990). A negative cycle is created leading to a widening of the academic gap (Means & Knapp, 1991) and an increasing feeling of not belonging (Finn et al, 1990), which culminates in the high school student dropping out prematurely from school.

Early prevention of low achievement for the at-risk child is the key. Furthermore a crucial matter concerns the actual preventative assistance given - drill/practice or the development of metacognitive and cognitive skills, or a mixture of both. Metacognitive and cognitive strategies need to be taught in the context of meaningful tasks. It is largely argued in the empirical research to date that small, cooperative groups of mixed ability are more effective. Initial withdrawal of small cooperative groups would initiate and consolidate emerging metacognitive knowledge and strategy acquisition. Reciprocal teaching would be an economically viable teaching approach that emphasises metacognitive strategies within small cooperative groups and it is a framework which can be feasibly adapted to the mainstream classroom. Also, there would be less chance of at-risk students returning to remedial classes as the positive effect on motivation through active participation. In reciprocal dialogues which are shaped by constructive feedback, support and encouragement from teachers and peers enhancement of autonomous student learning. Self-regulation will help it is argued, maintain and develop reading comprehension fostering and monitoring skills in the classroom.

One of the most highly valued attributes in western society is high ability and this is reflected in the primary school classroom. Even if reciprocal teaching is adapted to the

mainstream classroom, its impact is largely dependent on the classroom climate, whether it is a mastery or ego-orientated classroom structure. Thus when classrooms focus students on their ability to perform, students do not complete work or tend to use ineffective learning strategies (Padron, 1991). Ames and Archer (1988) have found that when students perceive their classroom as emphasising mastery (reduced social comparisons; increased involvement in learning; focus on effort; promote beliefs in competence; increase chances of success), rather than performance goals (rewards for a few; social comparisons; grouping by ability; value winning over fairness; focus on demonstrating high or avoiding demonstrations of low ability, because ability is highly visible), they are more likely to use effective learning strategies.

CHAPTER THREE.

METACOGNITION AND MOTIVATION AS RELATED TO THE DEVELOPMENT OF READING COMPREHENSION SKILLS IN THE AT-RISK STUDENT

Metacognition As Related To Reading Comprehension

Reading for understanding requires a great deal of effort in contrast to reading for pleasure, which is often an effortless activity. Effort alone however, will not assist the reader in gaining a full understanding of the text. When a text is to be studied the reader proceeds slowly, often rereading, asking questions in order to gauge their level of understanding, indeed evoking a whole variety of learning and self-monitoring activities. When attempting to gain a deep understanding of the text, emphasis needs to be placed on utilising a repertoire of effective strategies which are flexible and appropriate to the text (Palinscar & Brown, 1989). Learning from text requires the reader to operate on two cognitive planes (Garner, 1981). The reader needs to concentrate on strategies which promote understanding of the text and at the same time to concentrate on themselves as learners, checking to see if the approach they are using is resulting in learning. Effective comprehension strategies are those which serve this dual function,in that they aid in a deeper understanding of the text and also assist in monitoring their level of understanding (Brown & Palinscar, 1989). It is these comprehension fostering and monitoring strategies, in other words metacognitive processes, that are purported to promote a deeper level of understanding.

Metacognition plays a significant role in reading tasks as students progress through primary to high school. Skilled readers it is postulated, use metacognitive strategies (activities called forth to monitor cognitive progress) and cognitive strategies (activities

called forth to make cognitive progress) in the reading process (Jacobs et al, 1987). Good readers are actively engaged in studying the text and spend a significant amount of time engaging in summarising, questioning, clarifying and predicting, that is in the utilisation of metacognitive and cognitive strategies (Brown & Palinscar,1989).

Of particular interest in the development of metacognitive strategies are the roles planning, evaluation and regulation play in reading (Jacobs et al,1987). These processes are not often consciously executed by skilled and unskilled learners alike. Planning involves selecting appropriate strategies and the drawing on cognitive resources which affect reading performance (Schraw & Moshman, 1995). Examples include making predictions before reading and summarising the set text. Evaluation refers to one's awareness of comprehension performance whilst engaged in the reading assignment, as in periodic self-testing when involved in a task. Research suggests that self regulation develops slowly and is often quite poor in children and adults, although it is susceptible to training (Schraw & Moshman, 1995). A growing body of empirical research strongly supports the view that initial regulation by others may promote self-regulation. This requires the transfer of executive control from supportive others, to the learner (Osman & Hannafin, 1992). Hence active peer collaborative efforts are of paramount importance when attempting to develop reading comprehension fostering and monitoring skills.

A skilled reader is able to self-manage with regard to these three processes. Not all readers, especially at-risk students utilise these processes as they progress through primary school. Garner and Alexander (1989) argue that the two specific strategies which are not employed unconsciously or spontaneously by the academically at-risk are text reinspection and text summarisation. The authors postulate further that creating relevant topic sentences, generating questions on what they are reading and the integration of information are particularly difficult for the at-risk student. Research

findings suggest that students can be susceptible to strategy training which facilitates the effective use of learned strategies on multiple tasks. For instance, Stevens (1988) examined the effects of strategy training on expository text summarisation. The results indicated significant effects of strategy training on students' ability to identify the main idea in paragraphs. The present study focuses on teaching four reading comprehension strategies which comprise text summarisation, questioning, prediction and clarification as it is argued that at-risk students do not consciously or spontaneously utilise these strategies.

Defining Metacognition

It has been found in a significant number of studies according to Garner and Alexander (1989) that both children and adults fail to self-monitor, particularly failing to note whether or not they are comprehending what they are reading. The research literature differs widely in defining the processes involved in planful, self-monitoring and reflective thinking that are termed metacognition. Some researchers argue that metacognition is subconscious and spontaneous, others that is it conscious knowledge, which varies along a continuum of cognitive processes together with motivation and affect to purely cognitive processes without affect (Jacobs et al, 1987). It is pertinent to this study that a clear definition of metacognition is given as motivation is presently viewed as an integral part of metacognition. Both metacognition and motivation are continuously emphasised as important factors in the development of successful reading skills. Motivational states may determine the pattern of later metacognitive development, particularly during primary school (McCombs,1986). Furthermore it is argued that metacognitive strategies and motivation form a fundamental part of reciprocal teaching which is why reciprocal teaching is best suited to the needs of at-risk students who are often characterised as having limited metacognitive strategies and negative motivation patterns.

Although metacognition is often vaguely defined in the research literature, there is a common theoretical meeting ground, in that each learner has knowledge about their own cognitive processes and that they act as an executive controller of these states (Derry and Murphy, 1986; Jacobs et al, 1987; Paris et al, 1990). The emphasis is on *how* to think, *how* to learn and take active control over one's own thinking (Fairbarin et al, 1994).

A distinction is made in the literature between metacognitive knowledge and metacognitive skills (Brown et al,1991). Metacognitive knowledge is the knowledge about knowledge and knowing. Metacognitive skills are procedural skills that are necessary to the acquisition, use and control of knowledge and other cognitive skills. Slife (1985) postulates that metacognition requires something to plan, monitor and regulate, and cognition requires control processes to guide its functioning. There is a difference between having a skill and knowing when to apply it, between having knowledge and knowing how to access it, and being aware of how well one has performed a task. It is often difficult however, to distinguish what is metacognitive from what is cognitive, (Garofalo & Lester,1985). Garofalo and Lester suggest that one way of viewing this is that cognition is involved in doing, whereas metacognition is involved in choosing and planning what to do and monitoring what is being done.

Metacognition is influenced by whether the knowledge is declarative, conditional or procedural (Derry & Murphy,1986). Recent studies support the claim that skilled learners have declarative, procedural and conditional knowledge about cognition and this knowledge is linked to improved reading performances (Schraw & Moshman, 1995). Declarative knowledge refers to knowing about things such as knowledge of concepts as well as definitions of strategies, skills and cognitive processes. It has been argued within the research literature that the at-risk student has a frequently limited knowledge base and thus a diminished source of reference when attempting to read for

understanding (Means & Knapp,1991). Declarative knowledge can contribute to the at-risk student's planning, organising and tackling a task. This type of knowledge however, is fraught with errors as it may contain inaccurate information (Derry & Murphy, 1986), opinions and personal bias taken as facts (Paris and Winograd, 1990), and incorrect attributions regarding success and failure (Borkowski et al 1989; Paris and Winograd 1990; Osman & Hannafin, 1992). At-risk students are susceptible to these types of errors in that they simply believe that they lack the ability to make sense of information and thus do not engage metacognitive knowledge and skills when attempting the task. In addition, at-risk students often ignore incongruent ideas in a text (Paris & Winograd, 1990). It is argued that reciprocal teaching with peer dialogue helps students observe their alternative thinking patterns. When students are actively engaged in a task with a small group of peers as in reciprocal teaching, immediate and effective peer feedback on ideas which are incongruent with the text will be more likely discussed and opportunities to modify inaccurate information and personal biases will be made.

A second type of knowledge characterised by Derry is termed procedural knowledge. Procedural knowledge is knowing how to do something and includes performing a specific task and utilising an appropriate strategy in a given situation. Derry argues that many students do not spontaneously acquire procedural knowledge and argues that it should be taught explicitly. The explicit teaching of procedural knowledge supports the theoretical position that the at-risk student requires the explicit teaching of strategies in order to maximise learning effectiveness (Paris et al, 1990). The aim of metacognitive training is to make a child a skilful user of knowledge so that the student will know when or how to apply that knowledge.

Conditional knowledge applies to both declarative and procedural knowledge as this type of knowledge refers to knowing when and why to apply various cognitive actions

(Derry & Murphy, 1986). Schraw and Moshman (1995) view this type of knowledge as being declarative knowledge about the relative utility of cognitive procedures. They also suggest that conditional knowledge continues developing through the primary school level. Learners are more likely to use a learned strategy when they are given detailed, conditional knowledge about how and when to use it (Osman & Hannafin, 1992).

Factors Which Influence Metacognitive Development

It is important to bear in mind that although an at-risk child may be trained to use a cognitive strategy, the strategy may not be effective if the child is not ready to cognitively embrace it, pointing to the need for cognitive training to be matched optimally to the developmental and metacognitive level of the child (Cole, 1990). In reciprocal teaching frameworks students work within their zone of proximal development. This is defined as the distance between actual and potential intellectual development (Vygotsky 1978; cited in Brown, 1991). As students work within their zone of proximal development collaborating with peer coping models on moderately challenging tasks, students are perhaps able to understand the cognitive strategy being taught more effectively.

Empirical research points to the concept of metacognitive knowledge developing with age and experience (Garner & Alexander,1989). It has been found that older children tend to organise their learning, making plans, and having a supply of alternative strategies when one strategy fails. Younger children do have a degree of metacognitive knowledge but this is limited by their lack of experience, (Harter, 1986; Paris & Newman, 1990). Garner and Alexander suggest that metacognitive knowledge is abstracted from years of experience in the cognitive domain. Apart from cognitive development, regular changes in activities, organisation, evaluation practices and

ability-grouping patterns that children are exposed to at school may also contribute to developmental shifts in children's metacognitive processes (Chan, 1994).

Measuring Metacognition

It is often difficult to ascertain if metacognitive strategies are being applied in the appropriate academic context. Some argue that metacognitive strategies may be assessed through paper and pencil tests (Lysynchunk et al,1991), others argue that as yet there are not satisfactory tests available to tap into metacognitive development, and they point to the verbalisations of the learner as a means by which metacognitive processes can be measured (Padron 1991). There has been a call for several methods of assessing metacognitive knowledge, which do not share the same source of error (Garner & Alexander,1989). Thus used, both performance measures can verify (or fail to verify) data from verbal reports. Eye movements and underlined text are some suggested as examples of observable, nonverbal data.

Standardised tests employed frequently within the school system to ascertain text comprehension are unlikely to be sensitive to changes achieved in strategy instructional programs (Jacobs & Paris, 1987). Standardised tests are aimed at precise discrimination between students' reading ability levels, are based on generalised traits and not specific knowledge or strategies. These tests are measures of more general experiences and not measures of specific learning experiences. Most standardised tests are timed, which requires quick decoding, a rich vocabulary and expeditious inferences. Garner and Alexander (1989) state that strategies take time to employ, especially if they have been under utilised. When faced with a time limit, students might not be able to glean the main points from the text by selecting the main ideas, predicting from the title, self-monitoring and rereading when needing to clarify. The authors further suggest that students are often penalised when using metacognitive and

cognitive strategies as they are unable to complete the test in the designated time period. Tests that encapsulate the strategies taught are likely to be 'near-transfer' tests as opposed to their standardised versions 'far-transfer' tests, (Jacobs & Paris,1987). Garner and Alexander (1989) emphasise however, that there is still a place within the educational system for standardised testing procedures. They argue that standardised tests measure holistically, that is the whole academic picture, when gauging a student's test performance.

Motivation And The At-Risk Student

The issue of motivation is particularly salient for at-risk students because of the at-risk student's tendency to adopt an attitude of learned helplessness when experiencing repeated academic failure (Borkowski et al, 1990; Chan 1994). The reading task appears insurmountable, and the student gradually avoids not only assigned reading tasks but tasks across the academic domains, even though they may be capable of completing set tasks, as they perceive themselves as 'failures' and are therefore unable to experience success at any task. Motivation problems could also underlie the at-risk student's failure to employ efficient strategies.

Motivational states have been linked with reading task engagement and performance, both of which the at-risk student tends to approach negatively. The at-risk student tends to have an extrinsic motivational pattern and limited metacognitive knowledge and cognitive skills. High academic achievers appear to possess positive motivational patterns, high achieving students often being described in the research literature as being intrinsically motivated (Lepper et al, 1973; Means & Knapp, 1991; Deci et al, 1991). There is a general consensus amongst motivational theorists that intrinsic motivation takes the form of interest, spontaneity, curiosity, activity, and enjoying something purely for the sake of it. Intrinsic motivation is characterised by attention

focused in an orderly sequence, requiring effort and psychic energy.

Children are viewed from a motivational perspective as being born with intrinsic motivation patterns which are significantly enhanced or conversely, diminished by early childhood and subsequent school experiences. Self-determination theory emphasises the importance of parents, peers and teachers in influencing intrinsic motivation. According to Self-Determination theory, intrinsic motivation is organised by three innate psychological needs; competence, autonomy and relatedness (Deci & Ryan, 1990). Competence is defined as attempts to control outcomes in order to experience effectance and relatedness refers to a student's need to relate to and care for others. Autonomy is characterised by choice, feeling free in doing what one has chosen to do. Without the opportunity for the student to exercise autonomy, Deci and Ryan suggest that the psychological needs of competence and relatedness will not activate intrinsic motivation.

At-risk students tend to have extrinsically motivated patterns which increase as the child progresses through the educational system (Deci et al, 1991). Self-determination theorists in particular Deci et al (1990), suggest that motivation operates along the continuum by assimilation of some extrinsic motivation into the 'self' which subsequently becomes an internal motivational state. The more internalised motivational states become, the more students self-regulate behaviour when engaged in classroom tasks.

Extrinsically motivated actions can vary considerably in their perceived locus of causality. Firstly extrinsic motivation can be experienced as being solely externally compelled, hence no self-determination. In order to be self-determined or autonomous with respect to internalised regulatory processes, they must be fully assimilated, become part of the 'self' and bring them into harmony with other internal processes

that comprise the self. The least self-determined of the motivational states is introjected regulation. Introjection is characterised by the assimilation of a value but this value is not fully assimilated as it has not been fully accepted as one's own. Social pressures, guilt, compliance, rules, inherent tension and self-approval are associated with an introjected motivational style. This is the least form of self-determination as the person is being regulated and subsequently is not autonomous, has no sense of being the agent.

If organismic integration (assimilation through interaction) continues to function with respect to an introjected regulatory process, the student identifies with the importance of the activity for his or herself and thus accepts it as their own. The regulation that would follow is referred to as identified regulation and represents greater self-determination, than does introjected regulation. When the student has identified with a regulatory structure, there is less experience of pressure and conflict and less emphasis on guilt and anxiety. Tension still exists in the form of inconsistency between identified motivational states which have been internalised. For example, identifications between career ambitions and caregiving roles can be strong within an individual and yet at times to be antagonistic and full of conflict. The most self-determined form of internalised regulation is integrated regulation. This is where regulatory processes exist together without tension. A sense of integrity and cohesion of the self would be felt when an integrated motivational style is adopted. Engagement in a task is personally valued and freely done - in other words, it is autonomous. Integrated regulation remains distinct from intrinsic motivation because it is usually still an instrumental action, done because of its importance for achieving personal goals rather than because of its intrinsic interest. It is an autonomous learning style however, as a task would be engaged in out of a sense of willingness and not out of feeling externally compelled. The qualities that are associated with intrinsically motivated behaviour, such as behaving willingly, being creative and displaying

conceptual or intuitive understandings can be used as objective markers according to Deci and Ryan, of the extent to which an extrinsic regulation has become fully regulated.

As there is no obvious dividing line between intrinsic and extrinsic motivation, and some forms of extrinsic motivations are also internal and self-determining, it would be more beneficial to look at improvements in the at-risk student's motivation as movements away from extrinsic motivation, through introjected, identified and integrated motivation. Learning formats in the classroom which are autonomy supportive, that provide moderately challenging tasks and structure, and that contain involved others who encourage active learning are effective in encouraging self-determined task engagement and consequently increased motivation as they facilitate the at-risk student's satisfying their psychological needs of autonomy, competence and relatedness (Deci et al, 1981; Grolnick & Ryan, 1986; Deci et al, 1991).

In particular if the teacher possesses an autonomous orientation whereby they acknowledge value and encourage student independence; provide structure and positive feedback (competency orientation) and and are able to relate to the students (relatedness orientation) motivational behaviours will be enhanced as students are more curious, select more challenging tasks and increased independent mastery attempts are perhaps observed. An important feature of reciprocal teaching is the attempts by the teacher to meet individual needs of students. Reciprocal teaching promotes positive motivational behaviours in each student through teachers assuming the role of a coach, encouraging students to grasp a deeper understanding of the reading task, with each student attempting the task at a level which moderately challenges them. Instead of standing at the front of a classroom explaining strategies to a passive audience, teachers utilising reciprocal teaching methods are constantly interacting with students, prompting, providing feedback, diagnosing problems and reexplaining strategies

(competency orientation). Teachers using the reciprocal teaching framework are aware of praising effort expended and providing constructive feedback as well as support when students try to use learned strategies on a reading task (relatedness orientation); and provide scaffolding, in which the level of support is gradually lessened when students perceive themselves as becoming strategic thinkers and take responsibility for their learning (autonomy orientation).

Motivation As Related To Metacognition

There has been strong empirical support for a close relationship between motivation and strategic learning (Chan, 1994). Several cognitive theorists (Paris and Winograd 1990; Borkowski et al,1989) argue that the concept of metacognition is much broader than a purely cognitive element.

Self-regulation theory espoused by Zimmerman (1989) emphasises the relationships between motivation, metacognition and academic performance. Self-regulation is where students participate metacognitively, motivationally and behaviourally in their own learning process (Zimmerman,1989). The motivational component of Self Regulated Learning (SRL) determines what strategies will be chosen to perform a set task. Students will only be motivated to use particular strategies when they see them as useful in enhancing their mastery over a task. Pintrich and DeGroot (1990) examined relationships between motivation, metacognitive processes and classroom task performances and reported that students high in intrinsic motivation used more cognitive strategies and metacognitive skills. Research on at-risk students supports this finding. Pintrich and DeGroot argue that self-regulated strategies are better predictors of performance whereas cognitive strategies are better in assisting a student's actual performance. When cognitive strategies were measured without self-regulation strategies they showed a negative relation to performance. Hence students

need to understand how and why cognitive strategies contribute to their academic performance. Explicit teaching and valuing of metacognitive strategies a technique inherent in reciprocal teaching, will assist in academic achievement.

Borkowski et al (1989) extends this view of the interdependence of metacognition and motivation by suggesting that when a student applies strategic thinking to a task these actions directly influence self-concept which entails motivational states, attributions and self-esteem. In turn the motivational states aroused will determine new strategy acquisition, strategy transfer and metacognitive knowledge about set-tasks.

More recently Borkowski's delineation of the interrelationship between motivation and metacognition has incorporated two factors which critically influence motivation and metacognitive processes. Borkowski and Muthukrishna (1992) provide a developmental perspective on how metacognition is acquired and examine the effectiveness of strategy instruction as related to the classroom teacher's own metacognitive development. It is proposed by Borkowski and Muthukrishna that metacognitive processes develop in a linear fashion. The researchers traced metacognitive development in students who received what they regarded as high quality strategy instruction, in that the student actively interacted with the teacher and with their peers. The first step to developing metacognitive strategies Borkowski and Muthukrishna stipulate, is achieved when the student learns how to use a specific strategy following intensive teacher modelling and repetition. There exists debate over how explicit a strategy should be. Borkowski and Muthukrishna argue that explicit strategy instruction motivates the student. Empirical research on the at-risk student points to similar findings in that explicit teaching of strategies assists these students in developing a comprehensive and richer knowledge base as well as promoting the appropriate and effective use of strategies (Stein et al, 1989).

A critical stage of metacognitive development according to Borkowski and Muthukrishna is when 'specific strategy knowledge' is acquired. Specific strategy knowledge is attained when the student is able to understand the value of the strategy in a specific situation and generalise effective strategy use to other situations. The next stage of metacognitive development is characterised by the student learning other strategies and repeating the learned strategies, firstly in the designated curriculum area and then to similar tasks in other academic domains. The student is aware of when, where and how to use the strategies effectively following extensive practice of the strategy on multiple tasks. Intensive practice of learned strategies is a critical feature of Borkowski and Muthukrishna's theory of metacognitive development. Stage four in the development of metacognition is attained when the student is able to select appropriate strategies for a specific task and to gain a deeper understanding of the task by monitoring performance, especially when the strategy which is being learned has not as yet been fully understood. This is the beginning according to Borkowski and Muthukrishna of metacognition, which under pins adaptive, planful learning and thinking. In the classroom situation, metacognition begins to develop when a student analyses a set-task and selects the appropriate strategy. As metacognition develops following extensive practise of various strategies, according to Borkowski and Muthukrishna, metacognition is evidenced as strategy monitoring and revision. Stage four is successfully completed when the student's metacognitive and cognitive strategies have become refined, and the child is aware of the value of being a strategic thinker and beliefs about self-efficacy and levels of intrinsic motivation increase. This stage is termed 'general strategy knowledge.' Students attribute successful learning to the effort expended when thinking strategically rather than to luck or ability and understand that success at a task is linked to self-regulation. The metacognitive and cognitive skills are shaped by the motivational patterns adopted by the student. In order for the metacognitive system to function, students require sufficient information about both general and specific strategy knowledge - about why, when, where and

how to use the taught strategies. In order to assist students in becoming strategic thinkers intervention programs need to focus on the development of both the self and metacognitive systems.

More recent reciprocal teaching techniques represent a teaching format which emphasises development of metacognitive and cognitive strategies and positive motivational patterns. Through these particular reciprocal teaching formats strategic thinking is realised when the explicit teaching of strategies is emphasised. Strategic thinking is also prompted by practice on moderately challenging tasks. Undertaking of such tasks occurs in active small group dialogues with the teacher acting as coach, diagnosing problem areas, reexplaining strategies, providing constructive feedback and students assisting each other in enriching knowledge bases, correctly applying learned strategies and ironing out faulty thinking processes. The goal is for students to become autonomous learners and this sense of autonomy is suggested to be a significant contributing factor in the development of integrated motivational patterns (Deci et al, 1991).

The idea that motivation influences or directs metacognitive development is a concept that is shared by many researchers. Hence, metacognition will not develop sufficiently if motivation levels are extrinsically orientated. Intrinsic motivation patterns according to Borkowski and Muthukrishna energise choice of strategies and metacognitive processes and will be enhanced when a student uses strategies successfully. These researchers go on to suggest that a practical way in which motivation can be activated is through teacher and eventually peer feedback concerning the successfulness of performance and its specific cause.

Stage five in the development of metacognition is characterised by increased general knowledge about the world with a simultaneous enrichment of domain specific

knowledge. It is hypothesised that at this level metacognitive skills are often unnecessary as general and domain specific knowledge are sufficient in order to complete assigned task, although positive motivational patterns still remain a significant factor. Finally, stage six is attained when the student can create a positive image of themselves and project it into the future when self-set short and long term goals are visualised and seen as having been successfully secured. For example, the student in the present moment perceives him or herself as a 'competent student' and in the future visualises him or herself as a successful 'financial analyst.'

Research on reciprocal teaching has found that most students of varying ability levels can be taught to use the four reading comprehension fostering and monitoring strategies of summarisation, prediction, clarification and question formulations after teacher explanations and modelling, varied opportunities for practice and active engagement in moderately challenging complex tasks with peers (Paris & Winograd, 1990; Means & Knapp, 1991; Waxman-Hersholt & Padron, 1995). What is an area of concern is the failure of students to maintain the strategies which have been taught over a sustained period of time. Further, concern also arises over decreased tendencies for students to generalise learned strategies across academic domains over time (Garner,1990). From the perspective of Borkowski's metacognitive model, students who are confident in their learning ability, who are intrinsically motivated to learn and who have effort-related attributions are more likely to believe in understanding and using strategies in the longer term. In addition these students, it is argued, tend to develop more complex, mature metacognitive knowledge which they use in the mainstream classroom on a regular basis and where appropriate, across other academic areas. In this sense, the self-system energises metacognition by giving students reasons to learn. Although the self-system (attributions, self-esteem, motivational patterns) provides the necessary motivation to foster academic progress, it is however, the metacognitive system that provides the means to reach the task goal.

Metacognition In The Classroom

Highly developed metacognitive processes are reflected in a student's knowledge and appropriate use of a range of strategies which are perceived as interdependent and flexible. Metacognition is also associated with an increased awareness and use of alternative strategies when the available strategy does not produce the desired outcome (Borkowski & Muthukrishna, 1992). In order for a student to become a successful user of metacognitive strategies, Borkowski and Muthukrishna argue that classroom teachers themselves must possess a theoretical framework concerning what it means to be metacognitively aware and how best to use these strategies. A student will not persist with learning and implementing strategies if the teacher does not inherently value the use of such strategies, does not encourage regular reflections and planning skills and provide opportunities for the students to engage in intensive problem solving. If completion of assignments with little regard to understanding and emphasis on correct answers is a main priority for the teacher, then the researchers argue that the students will not be come strategic thinkers, or at least will not sustain their strategic approach to tasks for a significant amount of time. Hence the classroom teacher needs to become a strategy-orientated teacher in order to produce students who are strategic thinkers.

For reciprocal teaching to be utilised to its full potential with the at-risk student, teachers need to have knowledge about what it means to be metacognitive, to be aware of its value in getting students to understand what they are reading, to comprehend the stages of metacognitive development in order to diagnose difficulties and provide effective remediation and teachers need to understand the critical importance of motivation in the development and continued student use of metacognitive strategies. Unfortunately, several researchers including Duffy et al (1987) found that many classroom teachers did not in fact understand the importance of explicit strategy

instruction and did not possess a framework about children's metacognitive development that shapes the content of their learning activities and general educational goals.

Providing workshops for teachers on the interrelationship between motivation and metacognition may assist teachers in becoming more aware of the metacognitive processes involved in reading to understand. In particular the development of metacognition and its pivotal role in strategic learning is of paramount importance if teachers are going to effectively and explicitly teach metacognitive skills to at-risk students, as metacognition and motivation are critical factors in these students attaining success in reading (Means & Knapp, 1991; Brown et al, 1991; Schraw & Moshman, 1995).

A working model of metacognitive processes according to Borkowski and Muthukrishna (1992) cannot however, be generalised across the teaching profession, but instead each teacher needs to personalise the working model, that is, adapt the model to suit their own teaching styles and individual predisposition. The researchers suggest that the theoretical framework needs to be developed gradually with an initial emphasis on a developmental perspective. They further argue that the concept of a working teacher model is extremely useful in helping students maintain strategy use, as clear proximally-set goals can be reached, new information can be assimilated into the model which helps to provide interpretations of present situations and the model can serve as a springboard for alternative future actions.

Before a teacher can actually teach the metacognitive strategies effectively, Borkowski and Muthukrishna argue that they must integrate the main components of the metacognitive system. The metacognitive system comprises cognitive aspects in that the teacher knows a variety of learning strategies; understands when, where, and why

these strategies are important; selects and monitors strategies wisely, and is regularly reflective and planful. Motivational constructs in the metacognitive system require teacher awareness and promotion of student beliefs in careful use of effort; the merits of being intrinsically motivated, task-orientated and possessing mastery goals. Personal factors are part of the metacognitive system in that teachers themselves tend to adopt an incremental view of ability; do not fear failure, but realise that failure is inextricably linked to success; has extensive general knowledge and can access that knowledge easily. Finally, teachers need to understand and recognise and situational aspects in the development of strategic thinking and that teachers and students have had prior experience of being supported in these characteristics by the whole school community. There are several major obstacles according to Duffy et al (1987) to becoming a metacognitively orientated teacher. These researchers suggest that teachers often erroneously model what an expert reader does particularly with regards to the flexibility of a strategy. Teachers also had difficulty in developing strategies that facilitate metacognitive development. Duffy found that they often provided only limited background information about how good readers understand the text. Minimum teacher modelling was evidenced by Duffy and his colleagues, with teachers often requiring students to give content-based answers rather than on describing the processes involved in gaining a deeper understanding of the text. Teachers also tended to teach the strategies as unrelated to one another without requiring monitoring strategies. Classroom goals tended to be performance-orientated which according to Garner (1990) may not have lasting effects on strategy use as motivation to evoke strategies will diminish if not valued and given regular opportunities to be exercised. Several researchers have obtained similar findings on the critical effects classroom practises have on the use of learned strategies. Ames and Archer (1988) found that high school students who perceived their classrooms as mastery-orientated (where strategies are valued, students are given opportunities to practise learned strategies; emphasis is placed on understanding rather than getting assignments correct; teachers

reinforce attempts at understanding text rather than finishing of an assignment because it was set) used more learning strategies than students from classrooms which were performance-orientated (emphasis is placed on grades; peer competition as opposed to cooperation; deadlines; ability as the critical factor in success with effort expended in understanding devalued).

<div align="center">Summary</div>

A large amount of metacognitive research has centred on how to make students more knowledgeable about their own abilities and limitations and about how to use those abilities and to work around their limitations. Metacognitive knowledge it is argued in the present study is imperative if the at-risk student is to succeed within the school system. The earlier the metacognitive knowledge is presented the more effectively the at-risk child will meet and perform tasks with a metacognitive nature as he or she moves through primary to high school. Motivation is viewed presently as being an essential part of the effective use of metacognitive strategies. Autonomous motivation patterns need to be developed in order for cognitive strategies to be regularly utilised. If the strategies are not valued and taught explicitly, it is argued that the cognitive effectiveness will be limited and not maintained over time. The strategy-orientated teacher who is aware of the stages of metacognitive development in combination with teacher and peer reinforcement of effort and strategy use and teacher value of reading comprehension fostering and monitoring skills is of critical importance to the at-risk student's development of reading skills. The strategy-orientated teacher it is suggested by Borkowski and Muthukrishna (1992) will tend to provide opportunities for the at-risk student to focus on appropriate strategy selections and not solely on effort which will give this student a more tangible sense of self-control and at the same time develop problem solving skills which facilitate in the development of metacognitive knowledge. Recent reciprocal teaching approaches have incorporated the

explicit teaching of metacognitive and cognitive strategies within a framework that encourages active participation and self-responsibility when comprehending a reading task. Hence value and perhaps long term use of effective strategies on multiple tasks by self-regulated students will be increased within the reciprocal teaching framework.

Reciprocal Teaching of Reading Comprehension Skills

Much of the research that is available suggests that it is pivotal to develop reading awareness in young children in order to improve performance and to make instructional intervention significant. The aim is to improve their awareness and use of strategies. Reciprocal teaching has assisted specific student populations who have been identified as having difficulties in reading and writing, such as the child experiencing learning difficulties (Paris & Winograd, 1990) and the at-risk student (Waxman-Hersholt & Padron, 1995). Waxman and Padron assert that poor quality classroom instruction for the academically at-risk student is prevalent in most primary schools. They argue that the more recent instructional approach of reciprocal teaching has improved the education of at-risk students. Reciprocal teaching as put forward by Palinscar and Brown (1984;1989) and subsequent research following a similar format (Lysynchuk et al, 1990), has been purported to enhance at-risk students' development of reading comprehension skills in particular.

In the original reciprocal teaching studies conducted by Palinscar and Brown (1984) reciprocal teaching referred to a form of learning whereby children are immersed in a particular set of cognitive activities. The main objective was to design a teaching format that was practical in the sense of assisting students improve performance levels but also to take charge of the learning process (Brown & Palinscar,1989). Reciprocal teaching is an instructional procedure in which teachers and students take turns leading discussions about shared text. Emphasis is placed on group dialogue which includes

spontaneous discussion and argument. The purpose of the discussions is to achieve joint understanding of the text through the flexible application of four comprehension strategies (summarisation, questioning, prediction, clarification). The groups are usually small (no more than ten, although Brown (1991) suggests that the ideal group size is six). Initially the teacher assumes the role of leader modelling predicting, discussion, question, summarising, and clarifying skills. This is an important feature of the reciprocal teaching format, in that underlying processes are made overt, explicit and concrete. The activity is initially modelled by the teacher always in appropriate contexts and not as isolated decontextualized skills. The four strategies of summarisation, prediction, clarifications and questions are embedded in the context of dialogue involving teacher and student and then moving towards student to student dialogues. The explicit teaching of the four metacognitive strategies only takes place during the actual task of reading, via group dialogue, with a clear goal of deriving meaning from the text (Brown & Palinscar, 1985;1989).

Following initial teacher modelling, the students themselves become teachers or leaders. For each passage, a child assumes the role of leader. Other group members support and provide constructive participation. Reciprocal teaching is most effective when the student responds when it it their time to be teacher, or when they answer questions of other peer teachers. All students are encouraged to respond even if they are not yet fully competent in the four strategies. As the students increase their responses, the classroom teacher can, Brown and Palinscar assert, discern the student's level of understanding which is often disguised by the student not willing to be involved until they are confident in their use of the strategies. The dialogue leader begins the discussion by asking a question on the first paragraph of the reading content and ends by summarising the main idea. Summarising is an activity which serves as a measure of the level of understanding gained from the text. If an adequate summary has not been obtained, this is not regarded as a failed attempt Brown and Palinscar

suggest, but as a valuable source of information that comprehension has not been fully attained and that remedial action such as rereading and clarification is required. Questioning is not practised as a separate activity, but as a measure of the level of understanding the student is attaining. Clarification occurs when necessary where there are confusions, whether in text or in the student's interpretation of the text. Prediction is often utilised at the end of the summarisation, to predict future content. If there is disagreement, the group rereads and discusses potential candidates for question and summary statements until they reach consensus.

There are critical components of small group dynamics which encourage learning. In particular, Brown and Palinscar found that active problem solving and reflection facilitates learning with understanding and are therefore likely to foster cognitive and metacognitive change. They further suggest that situations that stimulate dissatisfaction with the existing state of knowledge can also lead to cognitive change. Cognitive change is unlikely however, when the content material is unquestioned (Borkowski et al, 1989). Specifically, reciprocal teaching through the use of dialogue and differing viewpoints assists a student in reevaluating their position on a given topic, hence refining their own thinking and developing the ability to look at a topic from several points of view. This is an approach the at-risk child finds difficult as they tend to cling to prior knowledge which is often faulty and avoid changing this knowledge base (Paris and Winograd, 1990).

Reciprocal teaching of reading comprehension can be used with academically at-risk students as long as they possess sufficient decoding skills so that they can engage in silent reading (Brown & Palinscar,1989). Indeed Palinscar and Brown suggest that academically at-risk students who enter a reciprocal teaching intervention program scoring ten per cent or less correct, require a gradual introduction of the strategies, with summarising being introduced first and adding the other components as each

strategy is mastered.

In reciprocal teaching, the teacher assumes a guidance role providing encouragement, support and motivation (i.e. stressing the meaningfulness and relevancy of the subject matter and providing feedback to the group). Specifically the teacher's role is to model the use of several cognitive strategies for the purpose of facilitating a deeper understanding of the text together with monitoring the development of reading comprehension skills. In addition teachers continually evaluate students' learning and provide constructive feedback and guidance. Another key element is teacher support of the students' attempts to remain on task and gain an understanding of the text. Teachers need to be in touch with the group dynamics so the group remains cohesive and aware of individual needs so as to know when to allow students to gradually assume a leadership role. As students become more active in the group and take on the leadership role without any qualms, it becomes apparent that the student is demonstrating the ability to assume responsibility for their own learning and hence control over the dialogue (Palinscar & Klenk,1991). Debate continues however, about what exactly constitutes expert and novice performances (Padron, 1991).

A discernible element of reciprocal teaching is the scaffolding during discussions, which encourages the student to take on a more active role than they normally assume. The dialogue and scaffolding are pivotal in the at-risk student making this transition to an active learner. Through the adoption of a more active role, these students become more autonomous and take responsibility for their own learning, which lends them to emulate behaviours often associated with the higher achiever (i.e. eager to participate, responsive to challenge, not dependent on praise and teacher coaching).

Feedback plays an important part in reciprocal teaching and has ramifications on motivational levels. The value of using a specific strategy has been shown to enhance

or diminish motivation levels (Bruce & Chan, 1994). Palinscar and Brown have chosen a novel form in which to present the feedback on each individual's progress (Palinscar & Brown, 1982; 1984; 1989). All students were appraised of their progress on a daily basis. They were shown graphs depicting the percentage correct for the previous day's assessment and a weekly cumulative record. Feedback is modified so it matches the individual student's needs and at the same time encourages the student to move to a more challenging level which they perceive to be in their grasp (Brown & Palinscar ,1989).

Motivation is inextricably linked to effort expended on learning and using strategies. A practical means by which motivation can be activated is through teacher and peer feedback when a student is actively engaged in using a strategy on an assigned task. According to Self-Determination theory, constructive feedback on observable tasks activates the competency need in that feedback activates efficacy beliefs (Deci et al, 1991). It has been found that positive feedback has generally increased intrinsic motivation and self-regulated behaviours because it enhances perceived competence (Ryan, 1982), although this enhancement is only evident when the feedback is accompanied by support for autonomy (Deci & Ryan, 1990). Negative feedback in the form of failure, has generally been found to decrease intrinsic motivation by decreasing perceived competence (Butler, 1987).

Feedback on performance Borkowksi and Muthukrishna (1992) suggest, is a significant way in which to increase general strategy knowledge which is largely influenced by the student's motivational patterns. The at-risk students will perceive themselves as strategic thinkers and are motivated to continue thinking strategically and selecting from a repertoire of strategies, when teacher and peers provide constructive feedback on contributions made to a set task. Another way is to explicitly present strategy information and strategy value information to students as in reciprocal

teaching of reading comprehension fostering and monitoring skills. This prompts students to be more strategic and to value strategies which in turn leads to an increased use of the strategies learned (Bruce & Chan, 1994).

Recent research however, has revealed an inconsistent pattern of strategy maintenance and application (Garner & Alexander,1989). The researchers suggest that perhaps some strategies are spontaneously learned with scant instruction and others are explicitly expounded yet fail to be maintained due to differing student motivational patterns. They argue that unless a student has a desire to reach a defined goal, strategy use which involves effort and time expenditure will not occur.

Cooperative Learning As An Integral Part Of Reciprocal Teaching

Peer interaction is a salient feature in reciprocal teaching (Brown et al, 1991). Peers are defined as fellow students who are approximately at the same cognitive level in relevant aspects so that none can be considered an expert (Schraw & Moshman, 1995). Vygotsky viewed metacognitive change in children as a process of gradual internalisation of cognitive activities originally experienced outside the self, in the company of others. A central theme of Vygotsky (1978, cited in Brown et al,1991), is the notion of zone of proximal development. This is defined as the distance between the actual developmental level and the potential developmental level, as determined through problem solving under adult and peer guidance. As the group's efforts are overt in the form of a discussion, novices can learn from the contributions of those more expert than they are at any particular point, a form of cognitive apprenticeship (Brown et al, 1991). This notion Brown asserts, is not to be confused with expert scaffolding, which it closely resembles. The main difference is that the participating children are not explicitly intending to tutor each other. Motivational levels are positively affected by cooperative learning. Collective group goals are set and

achieved, thus effort is valued and hence self-efficacy is developed (Sawyer et al,1992), which in turn affects motivational levels.

Groups provide social support for the efforts of their members, such as providing encouragement and constructive feedback. Through collaboration text deconstruction and therefore attempts to understand can be jointly managed. In addition, it is possible within group settings to share potential roles which may provide opportunities for disagreement over concepts read and strategies that an individual would often perform for themselves. Although conflict may be an essential trigger, it has been suggested that change is more readily the result of process of co-elaboration and co-construction (Bryant, 1982; cited in Brown & Palinscar, 1982). A major advantage of group over individual learning is that any group will benefit from the increased range of expertise of its members' combined knowledge. Group experiences can result in fundamental cognitive restructuring and not mere temporary compliance or imitation. Collaborative cognition depends on the initial competence of the child. One member of the group must not be overly dominant in a way that results in apparent consensus, with a weaker child giving way to a dominant one without considering the alternative views.

Some researchers argue, in particular Pogrow (1990) that education for the at-risk child will only be significantly improved if the skills and strategies are taught in ways that achieve transfer. Transfer means according to Pogrow that an intervention designed to develop skills in one area produces gains at the same time in other areas. Pogrow has developed an educational program targeted at the academically at-risk from grade four through to grade seven which aims to develop higher order thinking skills (HOTS). The drill and practice of basic concepts in remedial classes is replaced by thinking skill activities which are purported to enhance actual thinking skills, improve self-confidence and produce significant gains in standardised reading test scores for both reading and mathematics. The project has been running nine years and

remains highly successful, with significant gains purported to have been made both in reading and mathematics. Content learning is developed by increasing the conceptual ability of at-risk students to understand classroom content the first time it is introduced - a form of transfer. Pogrow asserts that it is not necessary to teach thinking or have the teacher model what thinking is, rather an emphasis on group interaction is needed so students have an opportunity to participate in the dialogue. The curriculum espoused by Pogrow creates situations where the students come to experience the need to think, and begin to share their perceptions of the thinking process with each other. Thus a fundamental aspect of the HOTS thinking model is that it does not 'teach' thinking or has the teacher competently modelling the thinking process. Pogrow suggests that it takes close to four months of daily practise of the strategies in group situations before students even come to understand the difference between guessing and using a strategy. Pogrow however, emphasises different strategy areas. Some researchers argue that maths strategies take considerably longer to develop, plan and monitor (Slife et al, 1985). This may not be the case for developing reading comprehension fostering and monitoring skills. Furthermore, perhaps Pogrow's emphasis on social learning without adult or peer modelling per se affects the time required in order to manifest metacognitive and cognitive skill development.

Evidence has been shown which indicates that reciprocal teaching of reading comprehension fostering and monitoring skills often maintains its effect over a sustained period of time, generalises to classroom comprehension tests and transfers to novel tasks that tap the trained skills of summarising, questioning and clarifying (Brown & Palinscar, 1989). Studies that have called upon the student to be active, provided feedback in the utility of the strategy and provided instruction in why, when and where such activities should be applied have been often successful in inducing transfer (Palinscar & Brown, 1987). Maintenance and generalisation of metacognitive skills as previously discussed, is still an area however of recent research and is

surrounded by much debate.

Several limitations to the reciprocal teaching model have been given attention in more recent literature (Rosenshine & Meister, 1994; Lysynchuk & Pressley, 1989; Pressley et al, 1992; Marks et al, 1993). These limitations specifically relate to the procedures employed (explicit instruction prior to reciprocal teaching; number of strategies taught) and how evidence is gathered and forms of assessment used to ascertain if reciprocal teaching has been a successful intervention or not. Quality of dialogue between students, standardised and experimenter-made tests largely comprise the forms of assessment to be discussed presently.

Earlier reciprocal teaching formats inspired by Palinscar and Brown's classic 1984 study, focussed on procedures which emphasised the reciprocal teaching of metacognitive and cognitive strategies without prior explanations of each strategy's components. Strategies are initially modelled by an expert in the reciprocal teaching format (RT only). The learned strategies are then practised in small groups through active collaboration in understanding a reading text, culminating in students' appropriate and flexible use of strategies by themselves. Teachers support students in this particular procedure through the use of scaffolding which is continuously adjusted to meet the cognitive needs of the student. Scaffolding includes modelling of strategies, providing prompts, models, cues, reexplanations of learned strategies and constructive feedback on the use of cognitive strategies (Rosenshine & Meister, 1991).

Towards the mid-1980's, studies were emerging that provided explicit teaching in the cognitive strategies by experts before the actual reciprocal teaching dialogues began (ET/RT). Studies varied in the amount of time given to explaining strategies. Variations in the reciprocal teaching format were also evidenced in number of strategies to be learned as well as the range of tasks used to practise previously learned

strategies (Rosenshine & Meister, 1994). The ET/RT procedure (explicit teaching of strategies prior to reciprocal teaching) entailed dedicating a specific amount of time to teacher-led explicit instruction in the strategies of questioning, summarisation, clarification and prediction. The strategies were modelled and related to students' prior experiences so as to make them more meaningful. Initially with the active guidance of the teacher, students practised the skills independently on stencilled worksheets and then through the use of short passages stimulating dialogue in small groups. Hence, the critical feature of the ET/RT procedure is that the explicit instruction of metacognitive and cognitive strategies takes place before the actual reciprocal teaching dialogues begin. The dialogues that follow the ET/RT conditions are the same as the RT only conditions.

There exists a procedural disagreement among researchers concerning the time span which is necessitated in order for metacognitive and cognitive skill development to take place. Palinscar and Brown (1984; 1987) suggest that 20 consecutive days are sufficient in order to produce improvement in reading comprehension monitoring and understanding. Palinscar and Brown's initial groups were however, at or near grade level in word recognition but two years below comprehension. Several researchers disagree with Palinscar and Brown's time span required for increased improvements in reading. Lysynchuk et al (1990) found that grade 4 and 7 poor comprehenders increased their comprehension fostering and monitoring skills following thirteen consecutive days of reciprocal teaching, and not twenty as suggested by Palinscar and Brown. The results obtained by Lysynchuk were not dramatic however, with the improvement being equal to an average six month change in the approximate grade-equivalent score at each grade level. Lysynchuk argues that similar findings are often observed in metacognitive training studies. The researchers postulate that greater improvement could have been made with a much longer treatment suggested by Palinscar and Brown, a treatment spanning several months to one school year

duration. Alternatively, Lysynchuk hypothesises that metacognitive training could be improved not by lengthening the amount of time spent in the intervention but by attempts made to activate prior knowledge bases and greater emphasis being placed on selecting specific strategies to be taught, in particular teaching only the summarisation and question strategies in a reciprocal teaching intervention.

Motivation affects strategy selection and use in the short and longer term (Pressley et al, 1992). A major factor influencing motivational levels, is the actual task difficulty, or elements of challenge inherent in it. This is an area where differences in interpretation of the concept of moderately challenging tasks aimed at being in the student's zone of proximal development and its importance in the reciprocal teaching approach is noted. Rosenshine and Meister (1994) suggest that regulation of material difficulty is an optimal instructional procedure for teaching the metacognitive and cognitive strategies. They suggest to start with materials below the grade level of the students.

Students who are at an early school stage rely heavily on decoding skills in order to read, and comprehension is introduced when students are able to utilise strategies in order to gain understanding (Humphreys & Parson, 1979). A critical procedural feature when attempting to facilitate student's comprehension fostering and monitoring skills, is the actual student's age. Rosenshine and Meister (1994) found that the student's age has been found to be significantly related to the successful development of comprehension monitoring and fostering skills. Upper primary grade students and high school students were found by Rosenshine and Meister to better understand and apply the reciprocal teaching methods appropriately and effectively.

Evidence concerning the effectiveness of reciprocal teaching on the reading comprehension skills attained by primary grade at-risk students is obtained by the at-

risk student's effective use of the four comprehension strategies - summarisation, prediction, clarification, and questions. Researchers frequently debate in the experimental literature what is the most effective number and type of strategies to be taught to at-risk students. For instance, Rosenshine and Meister (1991), found in their quantitative analysis however, that the number of strategies to be taught had no significant effect on the actual reciprocal teaching process. In Rosenshine and Meister's later quantitative review of 16 studies, eight studies taught four strategies which had a median effect size of .20. No significant relationship was found between the number of strategies taught and student achievement. Studies that taught 2 strategies, 4 strategies or 12 all produced significant gains in reading comprehension.

The number of strategies taught remains an area of debate with other researchers arguing that two particular strategies, summarisation and questions are of critical importance in the development of reading comprehension fostering and monitoring skills (Pressley et al, 1992). Many also argue that prediction and clarification assist students in gaining an overall understanding of the reading text (Marks et al, 1992). Practically it is very important that the students can handle an easy version of the strategies quickly, thus providing them with entry into the discussions (Brown & Palinscar,1982). Refinement in strategy use, however, is gradual and takes considerable practice. Brady (1990; cited in Rosenshine & Meister, 1994) investigated which of the four strategies were most effective in improving primary school aged students' understanding in different academic domains. Clarification and prediction were hard to utilise when studying a History of Social Studies text. Brady suggested that the history text may be more dense which hindered students in determining the meaning of a word by using context. Predictions were difficult to make due to a lack of coherence in the text and partly because of the chronological nature of the text. Rosenshine and Meister (1994) in a qualitative review found that summarisation and questioning were the most effective strategies in facilitating a deeper understanding of

a text as they both require a thorough search of the text and the performance of deeper processing that the prediction and clarification strategies. Comprehension monitoring is also much more aligned with these two strategies as difficulties in comprehending the text signal the learner that there are comprehension difficulties.

Changes in student's actual thinking processes as a result of strategy instruction need to be evaluated. Debate centring around the type and number of strategies to be used in order to enhance metacognitive processes has assisted researchers in gaining an insight into the differential impact strategies have on different types of students. Further research into the flexibility or conversely, lack of range specific strategies have in different academic domains is urgently required. More research on the effects of teaching different individual strategies and combinations of strategies is also needed and may provide insights into how students learn strategies best. Indeed, if comprehension can be significantly improved with one or two strategies, then it may not be necessary to teach four strategies. Future research in this area will significantly contribute to furthering knowledge into the most effective way in which metacognitive processes can be stimulated, developed and sustained over time.

Most of studies of reciprocal teaching targeting academically at-risk students use standardised tests to gauge if the children have improved in their reading comprehension fostering and monitoring skills. Rosenshine and Meister (1991) assert this form of assessment fails to tap into the knowledge and awareness of strategy use gained by the students. Experimenter-developed tests, it is argued, show more frequently the acquisition of strategies learned. In the review of 16 studies Rosenshine and Meister found that the median effect size for the studies using standardised tests was .32. The studies using standardised tests when instructing below-average students, had a median effect size (.08) that was lower than when good-poor or when all students were instructed. Standardised tests as opposed to experimenter-developed

comprehension tests were used more often with below-average students, and they usually gave nonsignificant results. ET/RT (explicit teaching prior to reciprocal teaching) and RT only (reciprocal teaching without prior explicit teaching of the strategies) studies were not effective when standardised tests were used. In a later review of sixteen reciprocal teaching studies, Rosenshine and Meister (1994) found that three types of tests were being used as outcome measures. Standardised tests and experimenter-developed short-answer or multiple-choice tests were frequently used. Experimenter-developed multiple choice tests consisted of a 200-800 word passage followed by 5 to 10 short-answer questions. About half the questions are factual while half required inference from the text. Thirdly, experimenter-developed summarisation tests were employed in several studies and comprised passages of 250 to 400 words that students were asked to summarise. Significant results were much less for the standardised testing compared to the two experimenter-developed testing procedures. Overall, the results for the experimenter- developed short-answer and summarisation test were similar and highly significant (eight out of eleven results were significant).

Results were basically the same when all students in a classroom were used as when only good-poor students were given the experimenter-developed forms of assessment. When poor readers were selected without attention to their decoding ability however, the effect sizes were higher when experimenter-developed comprehension tests were used and much lower when standardised tests were used. Standardised tests often focus on basic skill development in reading such as vocabulary development and phonic awareness with limited focus on metacognitive and cognitive processes. Experimenter-developed tests resulted in largely significant findings, regardless of type of student or instructional approach (ET/RT or RT only). Standardised tests were seldom significant on the other hand regardless of type of student or instructional approach. Rosenshine and Meister investigated a widely used standardised test, the

Gates-MacGinitie (1978) reading test in order to identify the discrepancies in experimenter-developed versus standardised tests. They found that on the whole, experimenter-developed tests were longer and this could have assisted students in answering the questions as they could use the larger context to help them. The limited context of the Gates-MacGinities paragraphs may have made answering those questions harder. The passages also differed in their use of topic sentences. The standardised test usually required the student to construct a main topic before answering questions on the topic in sharp contrast to the experimenter-developed tests which had an overview of the topic in the first paragraph followed by paragraphs which supported and extended the topic. The amount of search and rereading needed to answer a question was greater in the standardised test as well as a need for greater conceptual knowledge requiring more background knowledge and the vocabulary was more complex.

Standardised tests often use language which is outdated, use references to topics and situations which are frequently no longer relevant to students today and tend to be Eurocentric. Experimenter developed tests differ in that they are more sensitive and appropriate. Standardised tests still have a place however, in that they can be used across multiple grade levels and provide a general picture of how the student is performing at grade level.

The dialogue observed between peers is critical to the theory of reciprocal teaching. Rosenshine and Meister (1994) argue in their more recent review of sixteen studies which were all quantitative in methodology, that for effective evaluation of the reciprocal teaching technique, the actual dialogue needs to be assessed. These researchers suggest evaluating the quality of the questions and summaries during the dialogues. Quality of dialogue in reciprocal teaching sessions may be negatively influenced by such factors as student temperament and academic predisposition.

Furthermore, the usefulness of dialogue as a form of assessment may be significantly dependent on the student's age. For instance, Garner and Alexander (1989) argue that 'young' students often possess poor verbal dexterity and even if early school-aged students present as articulate, they will have difficulties in discussing general cognitive events. Early school-entry students, according to Garner and Alexander, by the very nature of their age, find it difficult to verbalise more abstract thought processes and when involved in discussions have a predilection to describing specific, very recent events. They suggest that verbal fluency is difficult for a lot of students. Garner and Alexander further found that students who lack skill in deliberate use of internal dialogue, (a trait which characterises the at-risk student), tend to have problems on tasks and situations requiring on-going effort, self-regulation and self-control, as in reciprocal teaching.

The potential problem of using ongoing dialogue as a source of assessment can perhaps be overcome by having teachers regularly encourage students to verbalise their internal dialogue in the mainstream classroom. In addition, as students gain skills in applying the four reading comprehension strategies their need to express themselves will be perhaps reflected in increased contribution to group dialogue.

Dialogue can also be improved by guiding students in developing question techniques which promote discussion of text content and a deeper understanding of the text. 'Yes' or 'no' response to literal questions will hinder the development of reading comprehension fostering and monitoring skills. Indeed, several researchers have been concerned with students' ability in group dialogues to raise the best questions in order to promote a deeper understanding of the text (Manzo, 1975). According to Manzo it would be beneficial if students ask themselves if they asked the best question they could as this puts emphasis upon acquiring a strategy for reading and learning more than just "getting through" the task at hand. It gives the student an opportunity to

influence the direction of the dialogue and therefore rewards self-monitoring behaviours. King (1994) suggests that questions designed to access prior knowledge are more effective in promoting a deeper understanding of the text. She distinguishes between 'memory' questions (where students remember and simply repeat what they have read in the text) and 'thinking' questions (questions which encompass remembering information from the text but also help the students think about the information in some way). A design which promoted deeper understanding of the text through question generation was formulated by King. The experiment involved a teacher explaining three different types of questioning techniques together with the appropriate explanation required. The teacher then competently modelled questions and explanations and used practice examples of different question formations. Question stems were then written on prompt cards which were placed in the centre of a table when paired students were involved in active dialogue in a cooperative learning situation. The questions comprised integration questions that went beyond what was explicitly stated in the text, connected two ideas together or asked for an explanation. Comprehension questions ask for a process to be described or defined. Lastly factual questions ask for recall of facts or other information explicitly covered in the reading text. Students developed questions King argues, which encourage a deeper reflection on the text and more varied explanations. She also found that students performed well on comprehension tests when questions formulated accessed prior experiences.

Adapting Reciprocal Teaching To The Mainstream Classroom

It may be possible to teach reciprocal teaching in the classroom when students are arranged in reading groups (Palinscar & Brown, 1984; King, 1994; Pressley et al, 1992; Marks et al, 1992). Palinscar, Brown and Martin (1987) found that reciprocal teaching is a practical teaching technique that can be quite easily and effectively transported to the mainstream classroom. Training of the teacher is of critical

importance as the teacher plays a crucial role in the development of students' metacognitive skills. Palinscar and colleagues suggest that the teacher's modelling of explicit metacognitive and cognitive strategies is of utmost importance. They argue that there is unequivocal qualitative evidence of improvement in the students' dialogue following teacher modelling, prompting, guiding, reexplanations, and feedback. Initially teachers need to be inserviced on the reciprocal teaching methods and actually taught how to be strategic thinkers themselves (Pressley et al, 1992).

Several researchers have explored the effectiveness of reciprocal teaching by the classroom teacher in the mainstream classroom with the classroom teacher. Brown and Palinscar (1989) in-serviced six remedial-reading seventh grade high school teachers on the techniques of reciprocal teaching. The teachers varied in teaching experience. The classroom teachers needed to modify the reciprocal teaching format when in the actual classroom as they found that in a science class of approximately thirty students the procedure was difficult to execute, particularly in regard to oral turn taking. The teachers found that the reciprocal teaching format was workable when they got the students to read the text in silence and then after each paragraph to write down their own summaries, questions, clarifications and predictions. After several paragraphs had been read and analysed, the teacher asked the students to volunteer their written strategies on a particular paragraph. Several versions of written strategies associated with the designated paragraph were written on the board and group debates were stimulated around which summary, prediction, clarification and questions were most appropriate and effective for the set paragraph. The groups were brought together and a general consensus reached on the most appropriate strategies. Brown and Palinscar found that over a term (ten weeks) the students improved greatly on their written summaries, predictions, clarifications and questions and also on their classroom participation and daily comprehension activities. This improvement could also be due to their age as they were high schoolers which some researchers suggest is a critical

factor in students understanding and using strategies which have been learned (Pogrow, 1990).

Reciprocal teaching has been transported to the mainstream primary and high school classrooms, but often not in its original format. Most research has revealed minor to large modifications to the technique depending on the age, academic area and type of students present in the classroom. Marks et al (1993) argue that reciprocal teaching is not easily extrapolated to the classroom and teachers need to adapt it to the needs of their own unique classroom situations. Indeed, Marks and her colleagues found it difficult to find enough teachers to be included in their study who had been inserviced on and continued to implement reciprocal teaching in their own classrooms. Eventually they found three teachers who continued to use reciprocal teaching after training. One teacher taught first grade, another special education to grades 6 and 7, and the final teacher taught literature to high ability students in grades 11 and 12. They found that the teachers in their study became frustrated with conventional reciprocal teaching and modified it so as to make it a much more attractive and applicable within their specific teaching contexts. The teachers all modified three main aspects of the reciprocal teaching technique. In these adaptations, reciprocal teaching often occurred as a post-reading activity rather than being applied to the actual reading text. The student leader role was also modified in order to encourage greater contributions in group dialogue. Further the students stayed in fixed groups arranged by the teacher.

The teacher's role varied according to the grade and level of student ability inherent in the class. The first grade teacher intensively explained and modeled strategies during the preparation period. During the actual reciprocal teaching, the classroom teacher adopted the role of facilitator, keeping discussions on track, otherwise the teacher observed each group, but participated only when needed. Each group leader had a laminated cue card reminding the student of the four strategies and what to say to make

a transition from one to the next. An example of the cue card is included in Appendix 2. The remedial upper primary teacher modelled nonliteral questions and assisted students by answering them. This teacher developed non-literal questions which were continually modelled throughout the discussions. The teacher also prompted the regular and appropriate use of non-literal questions by writing question stems on the board, on posters and on laminated cards placed on the desk, which students could readily refer to. Both the first grade and remedial teachers' initiatives on using cue cards in the reciprocal teaching sessions were adopted in the present study as it was viewed as a powerful means by which academically at-risk primary grade students could gain a deeper understanding of not only non-literal questions but all four strategies. In the present intervention, non-literal question stems were written on one side of a card and definitions of the remaining three strategies were written on the other side of the card. The regular rereading of specific written strategies when in the processes of trying to use a particular strategy would aid it is hypothesised, a clearer understanding of its components and when to use the strategy appropriately.

Many teachers who have received training in reciprocal teaching then proceed to abandon the method when teaching in a mainstream classroom. Perhaps this is due to frequently having thirty plus students in the classroom and attempting to form small groups then guide, prompt and diagnose problems for each group simultaneously. An innovative solution designed to address this problem of large class sizes is to have students prepare in advance for reciprocal teaching discussions through the use of individualised homework. Teachers view homework in this case according to Marks and her colleagues as a means of increasing engagement of all students in the reciprocal teaching process, which is difficult to do in a classroom of thirty students.

If reciprocal teaching is to be used widely in classroom, more attention must be paid to teachers' acceptance of the intervention method and how feasible it is to implement

reciprocal teaching in the primary and high school classroom. Brown and Palinscar suggest that reciprocal teaching can be adapted in the mainstream classroom by having students working concurrently on the four strategies using different activities at several work stations in the classroom. Approximately three or four work stations would be formed with the teacher working with a group in the conventional reciprocal teaching format, another group will be working on the computer with software comprising interactive texts which encapsulate the four strategies and other groups working on set exercises in work books. The age of the students needs to be taken into consideration as primary students require a great deal of teacher input at varying stages compared to their high school counterparts who can work for longer periods on their own. Also interactive computer texts are essentially a good idea, but in Australia most primary classrooms have only one computer per class. Perhaps having parents who are previously trained in the reciprocal teaching format for a specific academic domain work with a small group so that the teacher can oversee as well as conduct his/her own group. Alternatively, utilisation of the 'buddy system' with sixth graders tutoring third graders in the four reading comprehension monitoring and fostering strategies may assist teachers in working with and effectively monitoring groups. If most students tend to have a computer at home, homework could also comprise some facets of reciprocal teaching with students using computer disKs containing interactive texts and associated metacognitive exercises or simply in homework exercise books. It is essential that resources and people available in the school community are investigated for their potential value in making reciprocal teaching an attractive and feasible teaching package for the mainstream classroom in future research.

Successful Alternative Models to Reciprocal Teaching

The teaching framework which supports the step-by-step instruction of general cognitive strategies involves the initial explicit teaching of cognitive strategies as in the

ET/RT approach. Then the teacher guides the students as they practice until they perceive the students as becoming more competent and teacher guidance is gradually withdrawn. Scaffolding comprises models, guided practise, checklists and thinking aloud, but there is no reciprocal teaching (Rosenshine & Meister, 1994)

In summation, first the teacher models and identifies a strategy, then the teacher models the strategy and the student identifies it, and finally, students both use and label the strategy. This approach has had significant results in developing reading comprehension monitoring and fostering skills, particularly when experimenter-developed comprehension tests have been used.

Direct explanation about comprehension strategies is seen as a successful alternative to reciprocal teaching, (Pressley et al 1992). Direct explanation comprises teacher modelling and explaining strategies; demonstrating the value of strategies; teacher feedback about student progress when practising; cueing students to transfer the strategies to other academic domains and encouraging reflection and planning (i.e. to self regulate). The following are used as measures of student success rather than scores obtained on a standardised reading test; prior knowledge, the use of picture cues, interpretative student approaches and evaluating students' interpretation of events. According to Borkowski and Muthukrishna (1992) the basis of direct strategy instruction lies in the teacher's explanation of the strategy followed by comfortably challenging and intensive practice. In support of the need for explicit strategy explanation, Duffy et al (1987) found that when detailed strategy explanations were given by the teacher the student's understanding of the strategy increased.

A salient feature of strategy instruction is scaffolding in that the teacher assumes control in maintaining on-task behaviours and to the use of appropriate strategies. The teacher attempts to minimise misunderstandings by regularly providing and reminding

students of the step-by-step construction of a strategy, and reexplains any strategies which have been misinterpreted (Pressley et al, 1992). Thus the teacher is modelling competent strategic thinking. Teacher modelling is modified to suit the level of understanding of each particular student following teacher-student interactions. This form of scaffolding differs from the cognitive apprenticeship practised in the reciprocal teaching format as the emphasis is placed on the teacher's perception of the student's progress in acquiring a strategy and does not progress to peer perceptions of understanding. The aim is to develop autonomous learning through gradual assimilation of the detailed explanations of strategic thinking. Another critical component of direct strategy instruction is the use of extensive teaching and practice of a strategy over a long period of time and across academic domains.

Teacher prompting of strategy use is not an effective factor in student selection and use of appropriate strategies if the student has not experienced success in using the learned strategy caution Borkowski and Muthukrishna (1992). The authors suggest that success can be achieved through guided teacher practice with moderately challenging tasks, carefully monitored successes, and intensive teacher assistance when students require remediation. They also emphasise the valuable experience of failure and that students need to experience some level of failure as this experience can lead to opportunities to repair or perfect a poorly understood strategy. Another benefit of direct explanation with teacher modelling according to the authors, is that students acquire richer and more extensive metacognitive knowledge. Explicit instruction with feedback during practise of a learned strategy is seen as more effective than teachers asking students to infer a strategy's components. Teaching several strategies at a time, with much practice and deepening metacognitive understanding, is a major characteristic of direct explanation of strategies. To gain understanding, strategies are repeatedly modelled by the teacher with detailed verbal explanations of how to use the strategy and with information followed by extensive practice examples about the utility

of the strategy being taught.

Direct strategy instruction has been criticised for its lack of emphasis on the learner's active role in developing metacognitive knowledge. Borkowski and Muthukrishna (1992) argue that teacher-directed learning via detailed explanations and modelling assists students in developing a theoretical framework in which solid foundations are constructed and the student can then build on this foundation in a manner which bests helps them develop strategic thinking processes. The researchers suggest that students are then able to draw from a rich knowledge base when attempting to understand the characteristics of strategies and feel confident in exploring new strategies. Clear understandings of strategic thinking are further derived through interactions with more competent problem solvers, which are initially teachers and then with their peers.

Some experimenters argue that reciprocal teaching with its emphasis on teacher-student collaboration, spontaneous discussions and student active participation needs to be taught in conjunction with direct teaching of specific reading skills with students at-risk of failing. Reciprocal teaching in conjunction with an explicit phonics teaching approach has been reported by Bottomely and Osborn (1993) as being a more effective teaching method for at-risk first grade students, than reciprocal teaching only. Bottomely and Osborn investigated the differences between an instructional program that explicitly emphasised both decoding and comprehension and one that emphasised only comprehension. They argue that many researchers emphasise one aspect of reading, either decoding or comprehension, at the expense of the other. The results suggest that a reading program involving both the intensive decoding program and reciprocal teaching is effective. This form of teacher-student active collaboration in combination with direct teaching is termed 'transactional instruction' (Pressley et al 1992). Pressley et al suggest that the student's self-efficacy, motivational patterns, individual predispositions, responses and interpretations are of critical importance for

achieving successful metacognitive learning. Explanations of strategies are emphasised within a framework of teacher-directed activities which are interactive in nature (Duffy et al,1987).

The transactional approach encourages students to be active at all times in evaluating, monitoring and planning their own learning. This approach recognises that students personalise their strategies by modifying strategies so they make sense to themselves and to construct strategies to fit their own learning styles. Direct strategy and transactional instructional approaches share a common bond in that teacher-directed explanations of strategies are emphasised. But transactional instruction teaching places further emphasis however on the active transactions between teacher and student and between peers (Pressley et al, 1992). The major catalyst for discussions according to Pressley, inherent in the transactional approach is student explanations of strategies followed by teacher re-explanations of misunderstood or partially misunderstood strategies. Long term self- regulation is ensured as students learn with teacher direction, what strategy to apply to a set task, when to apply the strategy and whether to modify or reject interpretations of the text (Borkowski & Muthukrishna, 1992).

The teacher plays a pivotal role in the successful development of metacognitive strategies in transactional strategy instructions. Pressley et al (1992) were interested in the dialogue which takes place between the teacher and student, reflecting the transactional nature of strategic learning. Their qualitative research focused on effective teachers of transactional instruction during reading tasks and they found four main factors which comprise effective teaching. These teachers modelled strategies and guided students in developing and extensively practising a range of strategies. Secondly effective teachers assisted students in internalising a theoretical framework from which to develop further strategies by discussing why strategies are used and their individual components and gave many practical examples of when the strategy

could be effectively used. These teachers increased the students' general knowledge bases. Finally, highly effective teachers actively constructed meaning from the text with the students in order to enhance motivation levels. Furthermore, effective teachers also possess a theoretical framework on metacognitive processes and development which assists them in their clear, direct goals of teaching metacognitive strategies to their students. Strategy maintenance is encouraged by intensive repetitions, explicit explanations of comprehension strategies and the fostering of activation of student's prior knowledge. In summation, Borkowski and Muthukrishna found that effective strategy instruction occurred when students and teachers interacted cooperatively as they developed a deeper understanding of the importance of the strategic processes they were acquiring. Teachers assisted in the flexible use of strategies, and guided students to choose the most effective strategy for the assigned reading task.

Transactional strategy instruction was observed in an authentic classroom setting at Benchmark School, California. This school's population consists of underachievers who have experienced one or two years of failure in the regular education system. Of great importance is that the school and its staff work as a team, which is linked, according to Pressley and colleagues (1992), to the school's high success rate. In the actual transactional model, readers are encouraged to theorise to themselves (usually out loud) and to others about the reading process. Students are also shown how to construct text meanings and this is regularly encouraged through modelling and frequent prompting. Strategies are not taught separately, rather the teachers model how to use a new strategy in coordination with all other previously taught strategies, which they postulate is an effective method of strategy review, evaluation, maintenance and transfer. High levels of student-teacher interactions are purported to occur at the school (Pressley et al, 1992). Metacognitive dialogues are used at every opportunity to reinforce self-regulatory skills. Pressley suggests that the transactions occur in cycles which usually comprise initial teacher- prompted interaction often

through questions appertaining to the designated strategy (for example, students are requested to make a summary on a text segment). Several students respond, often turn-taking in their participation with teachers frequently but not always, responding to the students' comments. Students give each other feedback on the characteristics of a specific strategy. Feedback is a critical factor in transactional teaching and is stressed, especially in response to effort-involving strategy use. Students question their teacher and peers as the teacher continues prompting until a strategy has been successfully utilised (for example an appropriate summary has been given). Pressley argues that students on the whole are aware of the importance of turn-taking and communication when interacting with several students at a time.

Students gradually take on more responsibility for their own learning which it is argued increases self-efficacy and enhances motivation. Enhanced motivation is of critical importance in the development of metacognition and is reflected in the teacher's perception of motivation being the major building block in their theoretical framework on metacognitive development. The academically at-risk student however has often limited skills when initially working in small group situation (Rohrkemper & Corno, 1988). They suggest that these students are not aware in the beginning of the importance of the turn-taking procedure in group discussions. These skills must be developed over a period of time and require a teacher who is highly skilled in promoting cohesive group dynamics.

Transactional strategy instruction differs from many other forms of instruction including reciprocal teaching and conventional strategy instruction as it is taught throughout the school year and across the curriculum and is long range in its goals. Transaction instructional theorists argue that students require a long period of instruction in order to fully understand and effectively utilise learned strategies. Several other researchers agree that a longer instructional period may facilitate the long

term development and use of metacognitive skills (Lysynchuk et al, 1990; Pogrow, 1990).

Transactional instruction differs from reciprocal teaching not only in terms of its duration but also in several other critical areas. Transactional instruction like direct instruction teaches more strategies, perhaps because of the instructional period being much longer. An emphasis is placed on the role of the teacher in developing students' metacognition. Teachers are engaged in more direct explanation and modelling of strategies than their reciprocal teaching counterparts. Furthermore, transactional instruction encourages students to achieve a more generalised goal, that of becoming a motivated, skilled reader.

More recent studies exploring the reciprocal teaching method have incorporated several of the factors highlighted in the Benchmark school (Rosenshine and Meister,1994). In addition to procedural prompts, a number of other interesting instructional procedures have been used in some of the reciprocal teaching studies. Students were provided with cue cards that contained procedural prompts to which they could refer during practice (Marks et al, 1993). The teacher modelled procedural prompts to develop questions, as well as modelling good questions and summaries. Some studies adopted within their intervention design the general goal of students becoming motivated, skilled readers by realising students would not be able to achieve fluent reading skills with grade-matched texts and overcame this difficulty with the readability of set texts by using text material below the grade level. In addition, several studies have placed greater emphasis on the teacher's role within dialogue sessions with teachers remaining in a visibly supportive role even when student responsibility has been gradually increased (Rosenshine & Meister, 1994).

Summary

The reciprocal teaching method emphasises what the child knows and not what he/she lacks and thus the at-risk child should increasingly feel a sense of competency. Reciprocal teaching promotes peer interaction and active learning which will help redress the negative labelling at-risk students often experience. In having to take the role of teacher or supportive critic, the at-risk child develops metacognitive and cognitive strategies through summarising, clarifying, questioning, predicting, and more generally discussion and social skills which facilitate general communication and contribute to the development of an elaborated language code.

Another critical aspect of the reciprocal teaching package is its motivational elements which are so necessary for the at-risk child to develop, for without motivation the metacognitive and cognitive knowledge learned will not, it is argued be transferred to the classroom or maintained over time (Padron, 1991; Marks et al, 1993). Motivational elements are evidenced in the student becoming the teacher, thus assuming responsibility and control, feelings of autonomy, an internal locus of control and enhanced self-concept (Sawyer et al, 1992). Particularly, it is argued, the responsibility of learning becomes the child's and thus empowers the learner. As the child internalises metacognitive structures, it is hypothesised that they become less dependent on the teacher as coach and less extrinsically motivated (Collins et al, 1991). Lastly, it is hypothesised that through reciprocal teaching, the at-risk child will develop social skills which will facilitate his/her transition into the mainstream setting and help minimise harmful labelling and isolation from peers.

There is also a need to examine school processes which affect the at-risk child. Calfee (1991) argues that effective implementation of the reciprocal teaching model which attempts to explicitly teach metacognitive and cognitive strategies, requires change not

just on the classroom level but also in the school as a whole. This assertion is supported by Pressley et al (1992) in their investigation of transactional strategy teaching methods at Benchmark School for underachievers in California. Calfee goes on to say that the school needs to provide a coherent program that values intellectual development in all areas, and places this value above categorical distinctions among subject areas or between mainstream and remedial programs. But, despite the importance of the at-risk issue and the need to examine school processes which affect the at-risk student (Rumberger, 1987; Wehlage & Rutter, 1986) a new cycle of empirical studies have been few in number (Kagan, 1990)

On the whole reciprocal teaching is proving to be an exciting area in which students who are academically at-risk strive for meaning from academic tasks. As metacognitive and cognitive skills are being emphasised more strongly at upper primary and high school levels and with the advent of the information processing age which requires the development of these skills, this is not only an interesting but necessary approach to teaching, if these students are to have a fulfilling adult role in the next century. Most primary students will enter a workforce which is increasingly complex and has a rapidly changing information base. In order to gain successful entrance into the workforce, an individual must be able to acquire new facts, critically evaluate them and adapt their implications (Brown & Campione, 1990). Reliance on rote learning and remembered facts will not be sufficient in the near future.

Research Issues For The Future

Future research issues raised in the recent research literature focus largely on two main areas. Firstly questions are raised appertaining to the effectiveness of specific strategies and combinations of strategies. The second research area addresses the issue of how practical the reciprocal teaching format is in the mainstream classroom.

The cognitive approach views effective instruction as an emphasis on activating prior knowledge of content, accessing and assessing available strategies and connecting them to new learning. Stein (1989) suggests that insufficient attention to strategy-by-knowledge-base interaction is highlighted in the research literature. This is a critical area of future research as at-risk students often have a knowledge base which is not as 'school-friendly' as skilled readers' knowledge bases (Moshman & Schraw, 1995). Effective improvements in reading comprehension fostering and monitoring skills in academically at-risk students will be perhaps sustained and used appropriately over academic domains if research can gain a clear insight into what aspects of their knowledge bases are limited in general school knowledge and more specifically the gaps existing in their metacognitive and cognitive strategies compared to their higher achieving counterparts and how this limited knowledge affects the long term effective accessing and use of learned strategies.

As at-risk students generally enter the educational system with insufficient school knowledge bases, it is critical that these students experience effective remediation as early as possible. Indeed, it is generally agreed in the metacognitive research literature that early remediation of academically at-risk students is imperative. Cross and Paris (1988) suggest that metacognition and strategic reading become more congruent from 8 to 10 years of age. They argue that if awareness is poor at eight years of age, no gains can be made even after strategy intervention. Therefore, it is crucial to develop reading awareness in young children in order to improve performance and to make instructional intervention effective. Further research in this area will perhaps place a focus in primary schools on effective remediation based on the development of metacognitive strategies and not solely on basic skills development.

Which metacognitive and cognitive strategies are more salient for developing the at-risk student's reading comprehension fostering and monitoring skills, and how many

strategies to teach, are questions difficult to resolve (Rosenshine & Meister, 1991). Thus there exists a need for further research on the effects of individual strategies and combinations of strategies. Examining specific reading comprehension strategies which appear to be potent in developing metacognitive and cognitive strategies in the academically at-risk student may enhance a deeper understanding of the text over a longer period of time (Lysynchuk et al, 1991). Overall studies on metacognitive training have revealed less than dramatic results according to Lysynchuk, especially when maintenance and transfer of learned strategies have been the focus. Identification of strategies which are not only effective in developing reading comprehension fostering and monitoring skills but are also more readily maintained and transferred over academic domains may facilitate in the durability of learned metacognitive and cognitive skills. Research could involve comparing and assessing cognitive strategies to see which are the most effective in enhancing reading comprehension skill. For example, the cognitive strategies of prediction and clarification could be contrasted with question-generation and, or summarisation (Rosenshine & Meister, 1991). Question formulations and summarising enhance comprehension fostering and monitoring skills in that they require searching of the text and text reinspection and subsequently it is suggested both strategies perform deeper metacognitive processing. Rosenshine and Meister (1994) did find that questioning techniques followed by summarisation techniques had the highest success rate in their meta-analysis of 19 reciprocal teaching studies.

Clarification and prediction appear to be domain specific, contrary to Palinscar and Brown's 1984 assertions (Rosenshine & Meister, 1994). The researchers further suggest that a skill which is similar to clarification is the group of 'fix-up strategies' evoked when misunderstandings of the text occur and could perhaps lead to a deeper understanding of the text than clarification. More research on the qualities of specific strategies and the effect of different strategy combinations would prove fruitful.

The effects of teaching metacognitive and cognitive strategies to at-risk students' with reading comprehension difficulties have been studied, but we do not know according to Rosenshine and Meister (1994) what internal cognitive processes changed as a result of instruction and practice. Thinking out loud has been put forward as a possibility in gaining an insight into the development of metacognitive processes. Research in this area is urgently required.

Content material used in reciprocal teaching sessions is of importance in enhancing metacognitive and cognitive skills as well as the manner in which it is taught (Brown & Campione, 1990). It has been argued that students need to read texts that focus on recurrent themes, a suggestion which has been made in the later Palinscar and Brown (1987;1989) work. Further, it is argued that more narrative type texts need to be utilised in order to maximise the benefits available with the reciprocal teaching approach. More research is needed to ascertain the practicality of reciprocal teaching in the mainstream classroom where different text types are regularly covered and are often taught across the grade, in a theme.

Research on when to explicitly teach reading comprehension strategies and in which format may make reciprocal teaching a more comprehensive teaching product which will be more easily taken up by the mainstream classroom teacher. Earlier research on reciprocal teaching highlighted the critical concern of whether the experimenter needed to explain and model strategies prior to reciprocal dialogues rather than in actual reciprocal teaching sessions. General consensus in the research literature points to explicit teaching of metacognitive strategies (Rosenshine & Meister, 1994). More recently research has indicated that teaching strategies prior to actual reciprocal teaching sessions will enhance understanding of reading comprehension texts, especially when targeting the academically at-risk student (Rosenshine & Meister, 1994). These researchers suggest a further approach which may be more easily

adapted to the mainstream classroom in that strategies could be taught in actual reciprocal dialogue sessions. Explicit teaching within dialogues would put less stress on teachers who already find it difficult to slot curriculum areas into an already full timetable. Research in this area may make the reciprocal teaching package more attractive to the classroom teacher.

A critical feature of cooperative learning methods is that they require the gradual transfer of work responsibility from the teacher to the students. This may lead however, to problems for teachers with marginal classroom management skills (Slavin, 1989). Further research is required into teacher skills when dealing with behaviour problems that may arise when teaching situations are less structured and the major onus for learning is on the student themselves. Another area which deserves future research involves the critical importance of group prosocial skills. Research needs to shed light on how social skills develop (especially since the at-risk student often displays a lack of social skills in group situations) and what social skills factors contribute to a positive group cohesion which is so important in reciprocal dialogues which require spontaneity and 'flow'. Further more, collaborative cognition depends on the initial competence of the child. One member of the group must not be overly dominant in a way that results in apparent consensus, with a weaker child giving way to a dominant one without considering the alternative views.

Quality of reciprocal dialogues needs to be assessed in order to gain an insight into the development of metacognitive and cognitive strategies in the at risk-student. No reciprocal teaching studies to date provide a checklist that could be used to evaluate the quality of the dialogues using criteria that were specific to reciprocal teaching (Rosenshine & Meister, 1994). Teachers who attempt to adapt reciprocal teaching to the mainstream classroom have limited sources for guidance in practice and for assessment of implementation.

Most of studies of reciprocal teaching applied with the academically at- risk student use standardised tests to gauge if the students had improved their reading comprehension skills. Rosenshine and Meister (1994) assert this type of testing is not tapping into the knowledge and awareness of strategy use gained by the students. Experimenter developed tests, it is argued, show more frequently the acquisition of strategies learned. Debate on effective testing instruments of metacognitive knowledge and strategies continues, with empirical studies urgently required into developing such tests.

If reciprocal teaching is to be used widely in the classroom, more attention must be paid to teachers' acceptance of the intervention method and how feasible it is to implement reciprocal teaching in the primary and high school classroom. By training teachers in reciprocal teaching and in particular in explicitly teaching metacognitive and cognitive strategies, teachers' self-efficacy will be enhanced and opportunities for teachers accepting and persisting with this approach will be greatly increased. Borkowski et al (1989) found that one reason why the reciprocal training approach is effective is the emphasis placed on teacher explanation. Teachers are specifically trained to provide information about how to teach the strategies, providing strategy value information and when the strategies should be used. Trained teachers in reciprocal teaching provide more complete explanations that non-trained teachers (Duffy et al, 1987; cited in Borkowski et al, 1989). Duffy argues that students of trained teachers are more aware of when and how to use the new reading skills. Hence, teacher inservices are needed, shedding more light on how to teach a range of strategies and thus facilitate the at-risk child's academic and socio-emotional development.

In identifying the at-risk student a large proportion of research has centred on the at-risk student in the parameters of the classroom. The student's academic, affective, and

social behaviours must be taken into account. In order to do this, one must recognise that the at-risk student is part of a wider community, not only the classroom, but the school and home environment too. Reciprocal teaching it is argued presently can facilitate at-risk reading comprehension and prosocial skills, but the positive effects will be diminished if the wider school community is uncaring, and many teachers tend to have negative expectations and are unskilled in dealing with at-risk students. Further research is required into the effects of the school community on the durability of skills obtained in successive reciprocal teaching sessions, such as reading comprehension fostering and monitoring skills, increased motivation and active participation in mainstream classrooms.

CHAPTER FOUR.

DESIGNING AND IMPLEMENTING A PROGRAM OF
RECIPROCAL TEACHING AND READING COMPREHENSION
FOR AT-RISK LEARNERS.

Aspects Of the Literature Review which Contributed to the method and procedures used in the present study

Several assumptions were derived from the literature review regarding the academic needs of the middle primary grade at-risk student. The main assumptions made in the present study are as follows:

1.   Early intervention is preferable - the earlier the better (Pogrow, 1990; Means & Knapp, 1991). As Pogrow asserts, it is easier to develop metacognitive and cognitive skills the younger you are. Intervention at the primary level is required.

2.   Underachieving students often experience a different type of instruction in the remedial classroom from what usually occurs in the mainstream classroom. These students in the remedial classes often receive more basic skills drilling with less emphasis being placed on reading comprehension fostering and monitoring activities. Allington (1991) found that remedial classes tend to focus on phonics and vocabulary development with associated stencilled work rather than on understanding the reading text through the use of metacognitive and cognitive strategies. He argues that a lack of experience applying metacognitive and cognitive strategies to the task of reading may be a salient contributing factor to the slow development of such skills in underachieving children and when taught these strategies low achievement learners greatly benefit from instruction that includes metacognitive and cognitive strategies.

3.   Metacognitive skills can be developed in the at-risk school child (Padron 1991; Pressley et al, 1992). At-risk students can acquire comprehension skills - which have traditionally been called advanced (metacognitive) - well before they are good decoders of the printed word. At-risk children can learn to reason about new information, relate information from different sources, ask questions, and summarise using orally presented text (Means & Knapp, 1991). The at-risk student needs to develop metacognitive skills to experience reading comprehension success as he or she moves through primary and into high school, where metacognitive and cognitive strategies are increasingly emphasised.

4.   Academically at-risk students need to be explicitly taught metacognitive strategies (Garner, 1990; Moshman & Schraw, 1995). Metacognitive and cognitive skills are in increasing demand as the child moves through school. As at-risk student enters upper primary school they frequently experience two main problems; firstly, their knowledge of reading comprehension metacognitive and cognitive strategies is limited and they experience gaps in their reading skills. Secondly they have difficulties attempting to monitor and regulate when engaged in a reading task (Means & Knapp, 1991). Specifically, lack of experience in applying metacognitive and cognitive strategies to the task of reading may be a salient contributing factor in the at-risk student's low achievement in reading. Consequently, the at-risk student requires explicit teaching of metacognitive and cognitive reading strategies.

5.   Metacognitive change in children is a process of gradual internalisation of cognitive activities originally experienced in a cooperative group (Vygotsky, 1978; cited in Brown et al, 1991).

6.   Students do not necessarily use the cognitive skills they possess unless provided with motivating factors (Kagan, 1990). The at-risk student is often

extrinsically motivated. Several factors contribute to the development of a positive motivational style; a sense of autonomy leading to self-regulated behaviour; an internal locus of control; choice enhanced through decreased normative evaluations and increased mastery classroom situations; constructive feedback on set tasks; perceptions of enhanced competence, and an opportunity to actively participate in moderately challenging tasks.

Reciprocal teaching enhances the at-risk child's metacognitive, cognitive, motivational and affective development in the following ways:

1. The reciprocal teaching method is purported to build on prior learning and complement rather than contradict the child's experiences outside school, providing a motivating force which gives more meaning to the learning experience (Brown et al, 1991).

2. Reciprocal teaching assists at-risk students to adopt an elaborated language code, which facilitates their social and academic progress in the classroom (Brown & Campione, 1991).

3. A discernible element of reciprocal teaching is the scaffolding during discussions, which encourages the student to take on a more active role than they would normally assume. The dialogue and expert scaffolding are critical factors in this student making the transition to an active learner. Through the adoption of a more active role, these students become increasingly autonomous learners predominantly by taking responsibility for their own learning. This leads them to emulate behaviours often associated with the high achiever (i.e. eager to participate, responsive to challenge, not dependent on praise and teacher coaching). Palinscar, Brown and Martin (1989) argue that training studies which aid the child to make this transition

from a passive to a more active learner, have been considerably more successful in teaching metacognitive and cognitive skills.

4.   At-risk students are often characterised as displaying low levels of motivation. Motivation can be fostered when these students are taught strategies to regulate their own learning process and secondly, when this instruction is conducted in social contexts that invite and depend on their engagement (Palinscar & Klenk, 1991).

Rationale For The Design Features Used In The Present Study

Reciprocal teaching with its emphasis on active student learning in small, cooperative mixed ability groups was proposed as a more beneficial learning vehicle in which to teach academically at-risk students reading comprehension skills. Direct teaching has been a popular remediation learning framework for teaching at-risk students in the primary school (Means & Knapp, 1991). Direct teaching as defined by Brophy (1988) largely comprises a great emphasis on teacher explanations, demonstrations and individual student practice provided by the teacher with little student involvement. Teacher control of the organisation, content and flow of the lesson is paramount in this form of teaching according to Brophy, with minimal teacher-student interactions. Research in the present study strongly suggests that students need to actively participate in their own learning in order to effectively utilise learned cognitive and metacognitive skills (Means & Knapp, 1991). Active student participation is especially important to the at-risk student, as passive learning is often associated with low achievement levels (Finn, 1991). Several researchers have recently argued that suggestions of a lack of active student participation in direct strategy teaching techniques are unwarranted (Borkowski & Muthukrishna 1992; Pressley et al, 1992). It is argued that good strategy instruction does indeed emphasise active student construction of metacognitive knowledge.

Borkowski and Muthukrishna argue that effective direct teaching of strategies is largely influenced by the teacher's ability to teach. Good teaching is defined by these researchers as initial strategy explanations and modelling which provide a framework whereby students explore new strategies. As students apply learned strategies to reading tasks, 'good' teachers guide students to effectively use each strategy through teacher-student and student-student interactions. Teacher control is however strongly emphasised throughout student learning, with the teacher assuming continuous control over group dynamics, students looking to the teacher for direction in using a learned strategy and not as in this design to coping peers; the teacher controls frustration, breaks strategies down into simple steps in each lesson until the strategy is used effectively. Pressley et al (1992) suggest that the teacher is not solely delivering content, but actively models strategic thinking and application to reading tasks. Pressley argues that transactional strategy teaching by 'good teachers' develops active learners, who engage in meaningful, planful, and reflective processing.

Brophy's findings diverge markedly from the findings presented in the present literature review when he suggests that students achieve more in class when they spend most of their time being taught or supervised by their teachers rather than working on their own. This assumption has been contested by many cognitive theorists, (notably Means & Knapp, 1991; Alexander & Gardner, 1986; Garner, 1991). They argue that students need to contribute to their own learning and indeed gradually assume the role of teacher whereby they have more control and responsibility over their own learning. Furthermore, the individual student seat-work activity Brophy recommends, often comprises practice in isolated decontextualized skills such as finding topic sentences, selecting summaries, finding the main idea. They are practised in isolation from each other and from the task of reading and comprehending intact text (Campione et al, 1991). This emphasis on subskills is accompanied by a lack of explicit instruction regarding the more complex strategies

that expert studiers use.

In summation Brophy recommends a dominant teacher role throughout all learning sessions where there is a great deal of academic teacher talk. Brophy postulates that the at-risk child requires even more active instruction and close supervision from their teachers than achieving students. Researchers adhering to a cognitive perspective argue that substantial amounts of seat-work activity is counter-productive for the at-risk child, mainly because seatwork activities replace text-reading opportunities, which are so necessary for developing reading skills. Campione et al (1991) posit that direct instruction hinders transfer of learning. Students taught strategies blindly without awareness of their rationale, value and applicability do not apply these strategies to related problems. Campione et al suggest that students need to be informed of the purposes of the skills they are taught and given instruction in the monitoring and regulation of those specified strategies.

A common thread existing between direct teaching and in the reciprocal teaching method in the present study is in the drawing of at-risk students out of the mainstream classroom and into support classes. Regardless of whether a mainstream or a pull-out method is employed, the instructional method for the at-risk child rarely facilitates grade level reading development (Allington,1991). The main rationale for using the withdrawal method as opposed to teaching the child in the mainstream setting is that it allows for more intensive instruction for academically at-risk students, in order to activate processes of metacognitive thinking. By withdrawing the child initially and teaching him/her explicit metacognitive strategies and enhancing motivational constructs, the child is more likely to assume an active role in the classroom, develop social skills, higher levels of self-efficacy and achievement motivation and able to read the language of the classroom more adeptly. It is further proposed that utilising the reciprocal teaching method, motivation to participate will be enhanced and this will be

transferred to the mainstream classroom situation.

The study focuses on developing strategic thinking in the at-risk child through the use of four reading comprehension fostering and monitoring strategies. Brown and Campione (1990) argue that skilled reading, which is increasingly required as the child moves through the school grades, requires focussing simultaneously on two levels when reading, in that the reader both concentrates on acquiring knowledge (cognitive strategies) and at the same time monitors their level of understanding (metacognitive strategies). Thus, the four metacognitive and cognitive strategies of prediction, clarification, question generation and summarisation were chosen because they not only assist reading comprehension, but they also provide opportunities for the academically at risk students to plan, monitor and evaluate their own comprehension (Collins et al, 1991).

Predicting requires students to hypothesise what the author will discuss in the next section of the text. Predictions prior to, or following reading of a text assist students comprehension. Lysynchuk, Pressley and Vye (1990) argue that by making predictions prior to reading, knowledge is tapped into which creates expectations, thereby increasing the meaningfulness of the text. Students construct self-set short term goals aimed at confirming or disproving the author's hypothesis. In order to predict successfully, students must activate the relevant background knowledge (Stein, 1989). In accessing prior knowledge bases, students can enrich their existing knowledge when utilising the prediction strategy by linking knowledge to be encountered in the text with their existing knowledge states. The predicting strategy also assists in the development of an understanding of text structure as at-risk students learn that headings, subheadings and questions inherent in the set text are useful means of predicting future events (Stevens, 1988). Predictions, unlike summarisation and question formulations however, do not necessarily need to be made for every assigned

reading task and developing strategic thinkers are aware of when a prediction is necessary in order to gain a deeper understanding of the text (Moshman & Schraw, 1995).

The clarification strategy like the prediction strategy, is applied where appropriate and not necessarily during each learning session. Not all reading texts possess unknown words or words which are difficult to understand. Perhaps the clarification strategy would be evoked more frequently when students encounter expository texts compared to narratives as expository texts often contain specific technical words that at-risk students with limited general knowledge bases, will not have usually read. As this present study used expository texts it is hypothesised that the clarification strategy would be regularly used when studying set texts. Clarifying an ambiguous word in a reading text does encourage the monitoring of comprehension difficulties (a metacognitive skill) and the recognition of meaningful or relevant content areas. When students are required to clarify, they tend to focus on several reasons why the text is difficult to comprehend such as new vocabulary, unfamiliar and perhaps difficult concepts (Palinscar & Klenk, 1991). They are taught to be aware of the effects of ambiguous words on comprehension and to use previously taught strategies to aid understanding such as rereading the paragraph and asking for help.

Questioning fosters development of the summarisation strategy through text integration. When students form questions, they initially identify key information in formulating appropriate questions and then self-test to see if they can indeed answer the question.

Summarising provides the opportunity to identify and paraphrase the important information in the text (Garner & Alexander,1989). Summarising stimulates analysis and selective encoding which require the development of metacognitive and cognitive

strategies. Texts are firstly summarised across sentences, and as the students' skills develop, across paragraphs, and across the set text. Students as they become more active and confident in the reciprocal dialogue are encouraged to attempt their summaries without looking at the passage. Several researchers have suggested that summarisation is a particularly difficult strategy to learn and is often not employed spontaneously by primary grade students (Garner & Alexander, 1989). Specifically invention of topic sentences and integrating main ideas across the text are particularly difficult.

Motivation is affected by metacognitive processes through self-observation, self-judgement and self-evaluation (Schunk,1990). Motivational patterns are hypothesised to influence choice of activities, effort expended and persistence (Borkowski & Muthukrishna 1992). Learners, especially academically at-risk, may doubt whether they can attain difficult goals, but working toward them and specifically breaking the goals into substeps increases motivation. The underachieving students delineated by Brown and associates (Brown & Palinscar, 1982; Palinscar & Brown, 1984; Brown & Campione, 1990; Brown et al, 1991) have a joint goal outlined for them, which is the goal of joint construction of text meaning. This goal setting may enhance motivation.

Academically at-risk students often display an impoverished metacognitive knowledge base and extrinsic motivational patterns that combine to hinder their academic performance (Carr & Borkowski,1989). These researchers argue that motivational patterns are an important aspect of metacognitive development. Motivational patterns power the metacognitive system by putting together actively based parts of social cognition to the development and use of cognitive strategies. This is reflected in the sense of control shown in effort-related attributional beliefs, increased participation in tasks and elevated self-esteem arising as a consequence of a child's successful use of

strategic skills. Negative motivation on the other hand, is said to suppress the use of available strategies and the acquisition of new ones.

Motivation is influenced by teacher and student feedback on the active use of learned strategies on set-tasks (Bruce & Chan, 1994). Constructive feedback also plays an important part in reciprocal teaching (Palinscar & Brown, 1984; Lysynchuk et al, 1990). Furthermore, the overt reinforcement and valuing of strategic thinking and associated application to appropriate tasks has also been shown to enhance or diminish motivation levels. This technique of providing information concerning strategy value and relevance may foster motivational levels which affect the effectiveness of the reciprocal teaching method. Palinscar and Brown (1984; 1989) chose an interesting form in which to present the feedback on each individual's progress. All students were appraised of their progress on a daily basis through the use of graphs showing the percentage correct for the previous day's assessment and a weekly cumulative record. Graphed as well as verbal teacher feedback on performance is incorporated into the design (cumulative records of students' graphed reading scores are included in Appendix 3) of the present study with the aim of increasing motivation and active participation in reciprocal dialogues.

Another major factor in influencing motivational levels is the actual task difficulty, or elements of challenge inherent in it. This is an area in which several researchers differ in their interpretation of a challenge and its importance in the reciprocal teaching approach. Rosenshine and Meister (1991; 1994) suggest that regulation of material difficulty is an optimal instructional procedure for teaching the metacognitive and cognitive strategies. They suggest starting with materials below the grade level of the students. Others argue large effects can be obtained with texts that are at a higher level of difficulty than the readers' ability level (Palinscar & Klenk, 1991; Marks et al, 1993). Quality of text is also of paramount importance. Brown and Palinscar (1989)

suggested that comprehension is enhanced by well-written texts, that are 'reader friendly'. Good comprehenders are not unduly perturbed by ambiguous content which is difficult to understand, and can effectively use appropriate strategies in order to gain an understanding of the text and to extract specific content knowledge that they do not as yet have. Students, however, who are not able to study reading texts effectively cannot adapt sufficiently to badly written texts and their reading difficulties are further compounded by their inability to draw from a general knowledge base which is often limited (Stein, 1988). Subsequently, students with poor reading achievement levels find it hard to apply learned strategies appropriately and effectively to ambiguous texts.

The number of reciprocal teaching sessions in various studies has ranged from 6 to 100, (Rosenshine & Meister, 1991). They found no relationship between the number of sessions and the significance of the results. Due to many factors, most of which centre around the school's tolerance of an extended intervention study, the number of RT sessions in the present study totalled 20 consecutive days, which in accordance with Palinscar and Brown (1984; 1989) is the appropriate number of days in which to gain positive effects regarding reading comprehension monitoring and fostering skills. Improvements in reading comprehension fostering and monitoring skills have been made however in less than 20 consecutive days. Lysynchuk et al (1990) in their study of fourth and seventh grade poor comprehenders found that increases on a standardised test of reading comprehension were achieved after 13 consecutive days of reciprocal teaching. The results were not highly significant however, but Lysynchuk argues that most findings associated with metacognitive training do not reveal highly significant findings. Less than dramatic results led Lysynchuk to suggest that additional improvements in reading comprehension following reciprocal teaching would be made if the treatment was substantially longer - spanning one school year.

Instructional group size has ranged from 1 to 22 students in Rosenshine and Meister's

meta-analysis of 19 reciprocal teaching studies. They found that the median group size of the significant studies was higher than the median group size in the non-significant studies. Low achieving students seem to benefit when they are placed in small, heterogeneous ability groups (Peterson, 1988). If students are arranged in pairs as was evidenced in the Palinscar and Brown's (1984), and to a lesser extent in Lysynchuk et al (1990) study, then rich and varied discussion is somewhat limited, and those students who are reluctant to participate initially or who are novices learning from the expert (as in Vygotsky's zone of proximal development, 1978; cited in Brown & Campione, 1990) will possibly experience less coping or expert models. Each group in the present study comprised six students in the first study and five students in each group (due to a smaller available sample) in the second experimental group.

Variations In Forms Of Reciprocal Teaching Examined

The actual approach to reciprocal teaching has largely taken two paths. The first path which was made initially by (Palinscar & Brown 1984) refers to teaching metacognitive and cognitive strategies through reciprocal teaching methods. The students with a small group of peers and guidance from the teacher, experience a set of metacognitive and cognitive strategies and gradually come to perform these functions by themselves. In reciprocal teaching without prior explicit teaching of comprehension fostering and monitoring strategies (RT only) the teacher and students take turns leading a dialogue concerning a set reading text. The teacher initially takes on the responsibility for the group's activities through providing prompts, models, cues, rephrasing or elaborating on student answers, statements and questions, and feedback on the use of cognitive strategies during the dialogues. Student participation includes elaborating or commenting on another student's summary; suggesting other questions, commenting on peers' predic tions; requesting clarification of material not fully comprehended and assisting in resolving misunderstandings (Rosenshine & Meister,

1994). Through experience, the student becomes more competent, the teacher increases his or her demands, and participation is encouraged at a slightly more challenging level.

A critical feature of RT only is that there is no instruction before the dialogues. Rosenshine and Meister (1991) discovered in the course of their meta-analysis of sixteen studies investigating reciprocal teaching that further research was conducted into reciprocal teaching methods, which emphasised explicit teaching in the cognitive teaching strategies (through extensive teacher-led instruction) before the reciprocal teaching dialogues commenced. This strategy they termed ET/RT which emphasises the adult explaining to subjects prior to reciprocal dialogues how to ask questions, clarifying unknown words, summarise passages and predict what would happen next in the text using passage clues. Positive findings for the format of ET/RT are supported by Lysynchuk, Pressley and Vye (1990) who explicitly conveyed to poor fourth grade comprehenders the usefulness and purpose of each strategy to use (prediction, clarification, questioning and summarisation) before the actual reciprocal teaching sessions. Throughout the instruction the experimenter provided praise and feedback. They found overall, an improvement in standardised reading comprehension.

The two forms of reciprocal teaching differ in how and when the initial instruction in the cognitive strategies occur. Explicit teaching before reciprocal teaching varies in length with the median length of instruction being four class sessions (Rosenshine & Meister,1991).

RT only and ET/RT in the present study were investigated in order to ascertain if the treatments had differential effects on the development of reading comprehension skills in the at-risk student. The explicit instruction of metacognitive and cognitive strategies

in the present study comprised teacher presentation, guided student practice and independent student practice and took place before the reciprocal teaching dialogues began (ET/RT). Throughout the instruction the adult provided praise and feedback as well as modelling strategies when students experienced difficulties. These lessons were aimed at introducing the students to the 'language' of reciprocal teaching by providing direct instruction in each strategy. The explicit teaching was followed by the reciprocal teaching dialogues. The actual reciprocal dialogues appear to follow the same format for both ET/RT and RT only conditions as recommended by Rosenshine and Meister (1994).

Emphasis in the present study is placed on active student learning in small cooperative groups. The researcher as part of the study's design feature, initially explains the components of the four strategies and how to effectively use metacognitive and cognitive strategies on multiple reading tasks followed by student practice (in the ET/RT groups) or as in the RT only groups, the researcher explains, models and guides students use of the four strategies whilst students are actively engaged in reciprocal dialogues. As students participate in the reciprocal teaching, (for both ET/RT and RT only groups) the researcher explains, reexplains, guides, coaches, prompts and praises students, gradually relinquishing control to the students as they demonstrate more self-regulated learning behaviours.

The question strategy was given greater focus in this study by the use of question stems that evoke metacognitive processes. King (1994) postulates that students need to be guided in using not only 'memory' questions (questions designed to prompt students to simply recall what they have read) and 'thinking' questions (students not only recall learned information but are prompted to think about that information in some manner). King argues that every memory question can be reworded into a thinking question and it is important that students understand this link between

memory and thinking questions as King argues that thinking questions directly shape the development of metacognitive skills. King found in a study investigating question generation by fourth and fifth graders studying science, that teacher-guided questioning drawing from prior student knowledge and designed to enhance discussion between pairs of students, improved comprehension and retention of set science material. Specifically, integration questions (the highest level of questioning) promoted more knowledge construction and integration compared to factual questions (the lowest level of questioning) which only managed to stimulate knowledge restatement (the lowest level of knowledge construction). In the actual study teachers were inserviced by the researcher on levels of questions and knowledge construction for four hours. Teachers and then students experienced explicit lesson plans, overheads and strategy prompt cards, concomitant with explicit instruction, use of examples and cognitive modelling followed by scaffolded student practice with prompting and constructive feedback. The use of prompt cards was incorporated into the present study's design. Laminated cards with a vignette of the four strategies on one side and a delineation of King's comprehension questions and connections questions on the other side were given to each group in both the ET/RT and R/T only conditions (an example of cue cards are included in Appendix 2). The comprehension question stems comprised the following: Describe . . . in your own words; What does . . mean? Why is . . . important? The connection questions were as follows: Explain why . . . Explain how. . . How are . . and . . similar? What is the difference between . . and . .? What would happen if . . ? Initial plans to use an overhead projector displaying the question stems could not be implemented as the researcher did not have access to one. Posters with question stems placed strategically in the room were used instead. The present study has incorporated several features used in King's (1994) study. Laminated cards with comprehension question stems were given to each group. Posters with question stems were also used as prompts and displayed prominently around the room. Explanation of literal and non-literal questions and King's examples

of question stems were given in the dialogue for the RT only and not as in King's study, prior to the actual intervention. King's question stems were also given as the reciprocal dialogue began for the ET/RT group, but as part of the explicit teaching prior to the intervention a general delineation of questions was given to this group of students.

In order to assist the at-risk student in developing a sense of familiarity with the reading texts as the reciprocal sessions progress, the reading material was organised into themes. Palinscar and Brown (1987) and Palinscar and Klenk (1990) found that students' on-task behaviour was enhanced concomitant with an increased tendency to use previously learned strategies on reading texts which followed themes.

Experimenter-developed tests have manifested a stronger experimental effect (Rosenshine & Meister,1991), than results assessed using standardised reading tests. Critical to the present study, is the finding that experimenter-developed tests have tapped into students metacognitive processes (Rosenshine & Meister, 1994). Rosenshine and Meister (1991; 1994) found that the experimenter developed tests frequently followed similar formats which comprised reading passages and a sequence of questions requiring short answers and/or requests to summarise material. Rosenshine and Meister (1991) found that there was only a single study in which cognitive strategies were taught with ET/RT and experimenter developed tests were used with below average students. It was found that the low achievers improved their reading comprehension performances. Rosenshine and Meister's (1994) review concluded that a successful comprehension outcome when using low achieving students is increased when using the instruction strategy ET/RT in combination with experimenter-developed tests.

Rosenshine and Meister (1991) conclude quite clearly that results from studies were

particularly weak when reciprocal teaching only was provided for below average students concomitant with standardised reading tests. The conclusions reached in the Rosenshine and Meister (1994) review of sixteen studies on reciprocal teaching indicated that students obtained higher scores on experimenter-developed forms of assessment. When standardised tests were the outcome measure, almost all results in the sixteen studies reviewed on RT only and ET/RT were nonsignificant. When assessment entailed experimenter-developed tests however, both ET/RT and RT only groups achieved similar gains and so there were no differences between the two approaches. ET/RT and RT appeared to benefit the high and low achieving students alike only when experimenter-developed and not standardised tests were used as forms of assessment.

A procedure for assessing the quality of dialogue referred to by Rosenshine and Meister (1994), is to examine the changes in student questions and summaries that occurred during the dialogues. Palinscar and Brown (1984) examined student dialogue and found that the quality of both student questions and student summaries improved significantly from the early sessions to the later sessions. In the early sessions students used fewer higher order thinking question stems; in the later sessions, questions were more complex and tended to be paraphrases of main points of the text. There was also a shift away from summaries that consisted of mainly detail and minor ideas to the inclusion of main ideas. No other study has included this form of assessment to date (Rosenshine & Meister, 1994).

Main Hypothesis Tested

The effects of reciprocal teaching on at-risk students were investigated in an intervention study which attempted to improve third and fourth primary grade at-risk students' reading comprehension fostering and monitoring skills through training in

the four specific strategies of prediction, summarisation, clarification and questioning; motivation levels and classroom participation.

The main hypotheses tested focus on reciprocal teaching methods in reading comprehension contributing to successful outcomes in fostering and monitoring reading skills in the primary at-risk student. A detailed statement of the hypotheses made in this study is as follows:

1. Reciprocal Teaching

a) Both ET/RT and RT only are predicted to improve reading comprehension during the intervention as shown by predicted improvements in PEP reading scores from pre- to posttest for all groups but the control.

b) It is further hypothesised that students experiencing the ET/RT condition show the greater improvement than those participating in the RT only treatment.

2. Explicit Teaching Before Reciprocal Teaching

Focus on four strategies (summarisation, questioning, prediction, clarification) in a series of reciprocal teaching sessions enhance comprehension monitoring and fosters comprehension skills in the at-risk child (Palinscar & Klenk, 1992). Students given explicit teaching of strategies before reciprocal teaching (i.e. ET/RT) are predicted to improve at a greater rate during the intervention than students who experience reciprocal teaching only. Specifically, it is predicted that the ET/RT group will perform better than the RT only on the daily reading comprehension question and answer passages.

3. Maintenance

Enhanced comprehension through use of the four specified strategies is predicted to be maintained by the ET/RT and RT only groups but not the control, over a period of six weeks indicated by performance in a social studies maintenance test administered six weeks after the completion of the intervention.

4. Motivation

At-risk students experiencing the reciprocal teaching approach are predicted to show changes indicative of a more internal locus of control by becoming more intrinsically as opposed to extrinsically motivated. Specifically, it is hypothesised that:

a) movements away from extrinsic motivation and toward introjected, identified and intrinsic motivation are shown from pre- to posttest for ET/RT and RT only groups, but not for the control group.

b) ET/RT are predicted to show greater improvement in motivation than the RT only group by moving away from extrinsic motivation and showing increases in introjected, identified or intrinsic motivation at a greater rate than the RT only group.

5. Behaviour Questionnaire

At-risk students experiencing the reciprocal teaching intervention show enhanced participation levels in the mainstream classroom. At the completion of the intervention as indicated in teacher ratings, on the questionnaire it is hypothesised that by using this experimenter-developed participation questionnaire teachers would report the at-risk students as becoming more active in class by participating in discussions, initiating questions, making an effort

with set tasks, compliance with classroom rules and hence more acceptable class behaviour. The hypothesised increased participation levels are maintained in the mainstream classroom for both ET/RT and R/T groups. No change is hypothesised for students in the control conditions.

In summation the reciprocal teaching method will manifest:

a) independent evidence of improvement in the strategies trained,

b) increased scores from pre- to posttest on the PEP standardised reading test,

c) reliable improvement on the training task (comprehension passages),

d) durability of the effect of training. (Social Studies comprehension passage plus ten attached questions set in the social studies lesson six weeks after the post tests),

e) enhanced motivation following the intervention,

f) generalisation of the effects across settings, notably to the classroom. (Behaviour questionnaire following ET/RT and RT only sessions).

CHAPTER FIVE.

METHODOLOGY AND PROCEDURES

A quasi-experimental design was used largely due to the researcher being the sole person who conducted the experiment. The experiment also included two primary schools (total N = 66 students), hence a relatively small sample was used which is more amenable to a quasi- experimental design as this type of design allows the possibility of a small sample (Huck et al, 1974). The processes and product of metacognitive learning were evaluated through a blend of qualitative and quantitative methods, with the emphasis being on quantitative methods.

The quasi-experimental design allows the experimenter to control when the observations are made, when the treatment is applied and with the interrupted time series approach, which group receives which treatment. This experiment is based on an interrupted time series. The time series designs have repeated observations or measurements before and after treatment and are effective in attempting to evaluate the effects of a planned treatment, as well as being very sensitive for investigating causal claims.

Table 5.1. Time Series Variations Of Data Collection

Data Collection	Term 1: School 1	Term 2: School 2
ET/RT (1)	9.05-9.40am	9.05-9.40am
ET/RT (2)	9.45-10.25am	9.45-10.25am
RT Only (1)	11.15-12.00am	11.15-12.00am
RT Only (2)	12.05-12.40pm	12.05-12.40pm

The fundamental purpose of any experimental design is to attempt to control conditions that would otherwise influence the effects of the independent variables upon the dependent variables. With this purpose in mind the design selected for the present study is the pretest-posttest control group design which has been described by Kerlinger (1970) as a 'true experimental' design. This design involved the use of stratified randomisation of subjects to experimental and control groups as random assignment to experimental and control conditions controls all possible independent variables. Sample size however, is a critical factor in whether true randomisation can act as a control (Cohen & Manion, 1992). The researchers argue that the minimum sample size required needs to be thirty. Stratified randomisation using an appropriate sample size, ensures the greater likelihood of similar characteristics or factors of the subjects which may affect the experimental variables being equivalent in both experimental and control groups.

The At-Risk Student Population

A specific student population was focussed upon in regard to improving reading comprehension skills. The experiment focused on at-risk students who were in third and fourth grade at two Metropolitan East primary schools. In identifying the students to be included in the study, characteristics found in the at-risk literature were used as criteria for categorising a student as at-risk of academic failure.

A checklist was formulated using eight characteristics identified in the research literature as being predominantly associated with the at-risk student. (A list of criteria identifying the at-risk primary grade student is included in Appendix 1). If students fulfilled five out of the eight criteria they were identified as being academically at-risk. The criteria were chosen with consideration of availability and practicality. The information was obtained from various sources including school record cards,

mainstream and support teachers' records and verbal reports, counsellor verbal reports, parental comments when available and work samples, home/school liaison officer reports, previous year's test results, classroom observations and peer relations were also looked at in order to identify the at-risk student. The percentage of children who met each of the criteria are shown in Table 5.2.

Table 5.2. Criteria Used To Identify The At-Risk Student

Characteristics to identify the at risk student	percentage of students (out of a total of 66)
attending learning difficulties support class (S.T.L.D.)	87.9
low socio-economic status	93.9
have repeated a grade	36.4
frequently isolated from peers	74.2
extrinsically motivated	83.3
below average class reading test scores	80.3
low attendance	75.8
attend low ability maths group	92.4
Students who satisfied each of the eight criteria	12.1

Two salient characteristics were shared by a significant proportion of the at-risk student population and they comprised low socio-economic status (94% of the sample) and secondly, 92% of the students attended low ability maths groups. Only a third of the sample had experienced grade retention as this procedure is usually implemented in primary grades when the student is considered as being too young cognitively and behaviourally and this immaturity is perceived as hindering these students in

actualising their academic potential.

The at-risk sample comprised various ethnic backgrounds (60% Anglo-Saxon descent; 15% Italian descent;12% Lebanese descent; 11% Greek descent; 2% Fijian and 1% Norwegian descent). All students were born in Australia and were not attending English as a Second Language (E.S.L.) classes. 87% were from a single-parent family, with the mother being the parental figure.

Intervention Design

At-risk groups, all with reading comprehension problems, were randomly assigned on a stratified basis, to one of two training conditions or to a control group. The two instructional groups were (a) reciprocal teaching (R/T only), (b) Explicit Teaching and Reciprocal Teaching (ET/RT) and a control condition (pre- and posttest conditions only). In school one the sample consisted of thirty-six third and fourth grade students who were identified as at-risk. In school two thirty third and fourth grade identified at-risk students were involved, with the combined sample being sixty six students in total. In both schools R/T only and ET/RT groups were formed, two groups (n=6 in school 1 and n = 5 in school 2) were ET/RT, a further two groups (n = 6 in school 1 and n = 5 in school 2) were RT only, and two groups comprised the control (n = 6 in school 1 and n = 5 in school 2) where pre- and post- testing were conducted, but no actual reciprocal teaching as shown in Table 5.3. The control groups participated in daily curriculum activities in the classroom whilst the ET/RT and RT only groups were engaged in the intervention.

Table 5.3.   Composition Of At-Risk Students in Schools 1 and 2

| Group | No. of students in each group (brackets show total no. of students) | |
	School 1	School 2
ET/RT RT Control	2 groups of 6 students (12) 2 groups of 6 students (12) 2 groups of 6 students (12)	2 groups of 5 students (10) 2 groups of 5 students (10) 2 groups of 5 students (10)

Thus altogether there were twenty-two students in the ET/RT group, twenty two students in the RT group and twenty-two students in the control condition. The ET/RT group had nine girls and thirteen boys, the RT only condition had ten girls and twelve boys and the control condition comprised eleven girls and eleven boys. Altogether there were thirty boys and thirty six girls in the present study.

In both schools the ET/RT group 1 started the treatment at 9.05 am and finished 35 minutes later. Directly after the reciprocal dialogues had finished a 10 minute reading comprehension assessment was undertaken by the students on an individual basis. ET/RT group 2 started 10 minutes later in both schools and as with ET/RT group 1 finished 45 minutes later. RT only group 1 started straight after recess in both schools and RT only group 2 commenced in the intervention 5 minutes after RT group 1 had finished in both schools.

There were 3 pre- and posttest measures in the intervention administered to ET/RT, RT only and control groups. Firstly, a standardised reading comprehension test (PEP) was administered with 50 multiple choice questions on reading passages designed by NSW Education Department for middle primary students. During the period of the

intervention daily reading comprehension passages taken from a middle primary grade reading comprehension text by P. Howard, with 10 questions appertaining to each designated passage were also given. There were fifteen reading passages for the ET/RT conditions and twenty passages for the RT only conditions.

A participation questionnaire (experimenter-developed) was responded to by the class teacher for each student involved in the study as a pre- and posttest measure. Initially, the classroom teachers completed the questionnaire on what classroom behaviours they had previously observed the subjects demonstrate in the grade. Four days after the intervention had finished the classroom teachers once again completed the behavioural questionnaire from which changes in behaviour and levels of class participation can be inferred.

The Student Response Motivational Questionnaire (SRQ) developed by Connell and Ryan (1975) was administered in the withdrawal room where the intervention took place by the experimenter to all the students prior to and following the intervention. The students responded to 34 statements on the questionnaire. The pre- and posttest measures were specifically chosen as they are purported to be relevant in assessing the development of metacognition or indicating motivational and participation changes hypothesised as outcomes likely to be influenced by the teaching treatments (i.e. ET/RT and RT only conditions).

Daily comprehension passages were given in the intervention to ascertain progress made in the RT only and ET/RT conditions. The control was not given the reading passages as they did not participate in the intervention. Text difficulty level was previously ascertained by the NSW Education Department as the material was taken from the Countdown school magazine series for grades two, three and four in NSW public schools. Daily and weekly graphed feedback was given to the students on their

progress on the daily comprehension assessments (Cumulative weekly graphed student results are included in Appendix 3). Successive weeks were presented in a cumulative form so that week four showed the students scores for the entire intervention on a column graph. Constructive feedback was also given by the teacher and by peers in reciprocal dialogue sessions. In addition ET/RT and RT only groups' verbal transcripts of actual dialogues (following silent reading of comprehension passages) were recorded and assessed (Examples of reciprocal dialogue for ET/RT and RT only groups are included in Appendix 5). Evidence of using main idea questions and summaries were noted as well as the appropriate use of the prediction and clarification strategies. Further, demonstrations of more active involvement (in taking the leadership role, showing initiative in answering questions, providing feedback and support to others) formed part of the qualitative assessment.

A maintenance test was taken six weeks after all the delineated interventions. The maintenance probe occurred in social studies with no indication given to students that this test was part of the study and the material was also unfamiliar to the students. The regular classroom teacher administered the test to the entire class and was introduced as part of their social studies unit of work. The length of the text was approximately 750 words and aimed at grade level. This was parallel to the procedures by Palinscar and Brown (1984).

The study was commenced at school one in the first term, week six, 1995. For school two the study was implemented in term two, week six, 1995. The ET/RT groups in both schools commenced at the same time each day. Group one ET/RT's session began at 9.05am to 9.40am with group two ET/RT beginning at 9.45am to 10.25am. As with the ET/RT groups, the RT groups began at exactly the same time each day for both schools one and two. Hence RT group began at 11.15am to 12.00, with RT group two beginning at 12.05pm to 12.40pm. Each session was for approximately 45

minutes. In this design the students had twenty sessions for reciprocal teaching methods (one session = forty five minutes), conducted on consecutive days as frequency is purported by (Brown et al, 1991) to increase the intensity of the reciprocal teaching method. Sessions were conducted on all five school days of the week. The actual reciprocal teaching was for thirty five minutes with the reading comprehension passage and questions following straight after for ten minutes.

The Reciprocal Teaching Format

For all the types of intervention designs the actual reciprocal teaching method followed the same format as in the Palinscar and Brown (1984) design. Introduction to reciprocal teaching commenced with a discussion regarding the many reasons why reading text may be difficult to understand, why it is important to have a strategic approach to reading, how the reciprocal teaching approach will facilitate the student's deeper understanding of the text as well as its design (the dialogue structured by the strategies and the taking of turns in leading the discussion). The text was in a thematic form comprising continuous paragraphs focussing on a concept recommended by Lysynchuk et al (1991) in contrast to the isolated paragraphs of the initial Palinscar and Brown (1984) study.

Each day the experimenter introduced the passage with a brief discussion intended to activate the student's prior knowledge. The students were initially introduced to each of the strategies with teacher-led activities, (e.g. questions were introduced by discussing the role they have in our school lives). If the session began with a new passage, title predictions were called for. The student leader attempted to predict (before reading) what might be contained in the passage. They were asked to predict upon the basis of what they expected the text might be about or what they might have liked to learn from the text. The group was encouraged to share information they

already knew about the topic (activating prior knowledge) and the experimenter referred to their predictions as the text was read.

In the beginning, the experimenter modelled the role of the student teacher by initiating and maintaining the dialogue. The experimenter called attention to the title of the passage and asked for predictions. The experimenter provided further instruction and modelling in the use of the strategies in reading for meaning in the initial experimenter-led sessions. The experimenter encouraged everyone to participate at some level, for some this participation only comprised recalling one fact they had acquired in their reading. The experimenter regularly used prompts, cues, provided feedback - verbally and in a weekly graph form, modelled if necessary and generally assumed a supportive role throughout this activity. As the students acquired more practice in assuming the leadership role, the experimenter gradually relinquished control and gave responsibility to the students while adopting a role as coach, providing the students with evaluative information and prompting more and higher levels of participation. Another student teacher assumed the teacher role for the second paragraph and so on. Thus, the experimenter selected students as leaders as the reciprocal sessions progressed and the assigned student teachers began to ask questions, provide summaries and offer predictions and clarifications where necessary. If necessary the teacher assisted students by modelling strategy use, or provided reexplanations of how, when and where to use learned strategies.

Following predictions made on what the content contained, the students read the text in silence. A summary was then made initially by the leader, sometimes with written support from the text and on other occasions, the group leader attempted to pull the main ideas together and construct a summary. Students assisted the leader in reaching a summary. Clarifications were requested by the group and they attempted to define the unknown word together with reference to the sentences surrounding the word to be

clarified. It is important to note that clarification was not always required. If clarification was required, the experimenter attempted to elicit unclear points from the students. If a response was not given, the experimenter modelled the clarification strategy by pointing out something they noticed which could have been unclear or confusing. The students then read or listened to simple informational sentences about which they were to ask a question. Next, the students evaluated questions about short segments of text, and finally, the students generated their own questions from segments of the text. If the student couldn't think of a question, the experimenter prompted the student to summarise first. The leader was encouraged to ask others to generate questions.In the line of King's (1994) distinction between 'memory' and 'thinking' questions, question stems appertaining to comprehension and connection questions were used in the intervention. Question stems were explained, and displayed under the rubric "How To Ask Good Questions". They included (a) What would happen if...? (b) Why is .... important? (c) What does ... mean? (d) Describe ... in your own words. (e) How are ... and ... similar? (f) Explain why .... (g) Explain how.... Hence, questioning training was enhanced by explicit use of question stems as employed in studies by King (1994). Question stems and brief delineations of the four strategies were written on cards which were given to the group leaders (Example of cue cards are included in Appendix 2). Posters with question stems were also positioned in the classroom.

A similar sequence of activities occurred for each of the strategies (Brown & Palinscar, 1989). Thus the leader also summarised, formulated questions, clarified and made predictions during and after reading. After several sessions, students were encouraged to attempt their summaries without looking at the passage. The reciprocal teaching phase of the sessions lasted thirty minutes. The experimenter repeatedly reminded students to use the four strategies where appropriate. Other members of the group could be called on at any time to participate in the discussion. Assessments followed

this in the form of short paragraphs with ten questions, presented as a paper and pencil test and not an oral assessment. Analysis of verbal transcripts for both ET/RT and RT only groups was also carried out on three occasions (beginning, middle and end of reciprocal sessions).

The ET/RT Experimental Format

A comparison between the reciprocal teaching method and a second intervention model - ET/RT was made to explore Rosenshine and Meister's (1991;1994) hypothesis that ET/RT is more effective in improving reading comprehension strategies than RT alone. In the study there were three groups; (a) RT only (b) ET/RT and (c) control group. The control condition contained only pre- and posttest experiences for students.

As in the research of Palinscar and Klenk (1991), preparation for explicit instruction in the ET/RT condition took place 4-5 days prior to actual reciprocal teaching. Hence, the ET/RT condition provided students with explicit instruction in comprehension-fostering strategies and metacomprehension strategies. In addition an explanation of their usefulness in understanding and remembering the information presented in the paragraph was given. Students in this group were taught in the first five sessions specific strategies for identifying the topic and main idea of paragraphs, as well as predicting future content, clarification of ambiguous material and questioning techniques to prompt a deeper understanding of the text. (Practise examples used in the initial week with the ET/RT group are included in Appendix 4). Students were taught a self-checking strategy so that they could ascertain the appropriateness of their main idea statement by testing its accuracy in summarising the information in the paragraph. Students in the ET/RT condition were taught to apply a set of procedures similar to those employed by Brown and Palinscar (1984; 1989). Step one focused on identifying the topic sentence. Step two was as follows: If a topic sentence is not

given, then identify the topic and the most important information about that topic. Rule 1: Leave out unimportant information. Rule 2: Give steps of list a title. Rule 3: Cross out information that is repeated. The students were taught to identify the topic of the paragraph by identifying what subjects or concepts were discussed in each of the individual sentences. The students learned that the main idea of a paragraph summarised what the paragraph told about the topic. The summary was one sentence that covered all the main points of the topic, but it was not so general that its main idea could be equally well applied to a different paragraph on the same topic.

The strategies were not taught in combination so that each component was taught separately and was followed by student practice. The experimenter assisted the students as they consolidated these components, and finally, the experimenter withdrew this support as the students became increasingly independent. Thus, the strategies particularly with regards to summarisation and question formulation were taught as a series of subskills. Throughout the instruction the experimenter provided praise and feedback as well as modelling strategies when students experienced difficulties. These explanations were followed by actual reciprocal teaching sessions which were taught on consecutive days. Hence the ET/RT groups experienced Reciprocal Teaching for three weeks, on each school day (fifteen days in total).

Following each daily assessment and after each fifth session graphed results of comprehension question and answer passages were shown individually to the students, in both ET/RT and RT only conditions. The initial graph depicted the percentage correct for the first day and at the end of each week a graph was shown to each student depicting five days of scores in a column graph (a cumulative weekly record as in Palinscar & Brown, 1984, study 1). At the end of weeks two, three and four, the results were added to the column graph presentation. (Cumulative graphed records are included in Appendix 3). The present study is very similar to Palinscar and

Brown's study in that the present study used not only a weekly feedback but also showed the students' results daily and provided a weekly cumulative graphed record of their results. Verbal feedback was also emphasised throughout the RT and ET/RT sessions.

The teacher prompts in this study were focused on the actual reciprocal teaching sessions. For example the teacher would prompt the group by saying, "What question do you think a teacher might ask?" "Remember a summary is a shortened version, it doesn't include detail. If you're having a hard time thinking of a question, why don't you summarise first?" Predicting was explained by asking the students to find clues in the title and paragraphs that might indicate what will happen next. Clarifying was explained by asking the student to read the sentence and to find out what a difficult word means by making an educated guess. All four strategies were visually displayed on cards for both ET/RT and RT only groups and the group leader used this card as a reference point when initiating the reciprocal teaching session. (An example of the cue card is included in Appendix 2). Cue cards contained a delineation of the four strategies on one side of the card and examples of question starters on the other side of the card. The listing of question starters are examples of question starters that the teacher has modelled and would prompt in the reciprocal teaching sessions in order to assist in the formulation of non-literal questions. Modelling was also used: "A question I would have asked would be...". "I would summarise by saying ..."

In addition to the use of question stems as prompts, several other instructional procedures were used for both RT only and ET/RT groups:

1.   The difficulty of the instructional task was regulated for the students by selecting practice materials that were initially below the grade level of the students (Rosenshine & Meister, 1994).

2.   The difficulty of the instructional task was regulated by starting with simpler

tasks, such as constructing a question from a single sentence and then moving

to questions about whole paragraphs. The difficulty of the task was also

regulated by having the experimenter model the more difficult part of the task

as the students carried out those parts of the task they were capable of

completing.

3.   Student responsibility was gradually increased, although the experimenter was

available to support students as they performed particular aspects of the task.

Internal and External Validity Measures

The experimental design aimed to impose control over conditions which would

otherwise obscure the true effects of the independent variables upon the dependent

variables. Some of these conditions include factors other than the experimental

treatments occurring during the time between pretest and posttest observations.

Attention was given to both internal validity and external validity.

The present study attempted to achieve internal validity by firstly including a control

condition as well as treatment conditions in the study design. Attrition rates were equal

in both the control and experimental groups. Stratified random assignment to

experimental and control groups took place as any cause and effect conclusions would

have been compromised by non-random assignment. The same experimenter was

present for all conditions and therefore teacher-by-treatment confounding was avoided

(Pressley & Harris,1994).

Furthermore according to Cohen and Manion (1992), for an intervention to be

internally valid manipulation checks need to be put in place in order to check that

subjects do as they have been instructed to do. In the present study the checks were primarily verbal checks, comprehension passages and feedback sessions. In addition internal validity is also achieved with the use of process measures whereby conclusions about instructional effects can be made with greater confidence. In the present study taped reciprocal teaching sessions were transcribed and a class participation checklist was completed prior to and following the experimental period by the classroom teacher. Due to the nature of the present intervention, as often occurs in educational research, events other than the experimental treatments happen during the time between pretest and posttest observations. Such events may produce effects that can be attributed to differences in treatment (Cohen & Manion, 1992). In the present study this threat is not a major threat to internal validity as the study was four weeks in duration and not as such, a protracted study.

To have external validity specific criteria must be met (Cohen & Manion, 1992). The following criteria were met in the present study. Independent variables were adequately described by the experimenter. The students participating in the intervention are purported to represent the primary level academically at-risk population. Threats to external validity are limited in this case as this sample in the experiment represent the population to which the findings are to be generalised, that is the academically at-risk student population. The dependent variables that the experimenter employs in an intervention need to have validity in the non-experimental setting to which the experimenter wants to extrapolate the findings (Cohen & Manion, 1992). The intervention consisted of strategies designed to assist academically at-risk students in developing reading comprehension fostering and monitoring skills which could be generalised to the mainstream setting. Increased motivation and participation in class were additional objectives which would assist these students in remaining on-task, sustaining effort on moderately challenging tasks and participating in peer, group and class discussions and hence become part of the mainstream classroom. The

present study included standardised instruments which were previously tested with a similar student population (Pressley & Harris, 1994). The instruments consisted of the standardised PEP reading test and motivation questionnaire (SRQ). The level of reading ability was also ascertained in this study by teacher assessments, class work samples, student record cards and the PEP reading test.

The experiment also needs to be previously planned with hypotheses prepared for testing in the actual intervention. The present study was planned and not an ad hoc analysis. Several hypotheses were formulated to test before the study was conducted. Furthermore, follow up and durable effects of strategy instruction are required to be investigated so the findings can be generalised to other settings and populations. A Human Society and Its Environment (H.S.I.E.) comprehension and ten question format assessment was given as part of a maintenance probe in the present study. All students in third and fourth grade from the two schools including students who were part of the intervention (ET/RT, RT only and control groups) were given the assessment during a regular H.S.I.E. lesson given by the classroom teacher. The probe occurred six weeks after the study had ended and all students were unaware of any link between this assessment and the prior experimental study.

Data Collection Strategies

The measures used in the present study were as follows:

1. PEP Reading test.

2. Motivation questionnaire - SRQ by Connell and Ryan (1985) for student responses.

3. Behaviour Participation questionnaire - experimenter developed questionnaire for teacher responses.

4. Daily, sequential comprehension passages with 10 questions.

5. Transcripts from the fourth, eleventh and nineteenth sessions for both R/T groups and from the third, ninth and fifteenth sessions for the ET/RT groups.

6. Social studies maintenance passage and question test, six weeks following the posttests.

The following instruments were used in the present study:

The students selected for inclusion in the study were administered a PEP reading test (Test Y, Part A, 1976 edition) as part of a pre- and posttest measure. The PEP test was formulated for the New South Wales Department of Education by The Australian Council for Educational Research, ACER, 1976. The PEP Reading Test aids in identifying readers who may be in need of special attention. Children scoring the lower twenty five per cent all fall into this category. The PEP Reading Test is composed of factual, inferential and vocabulary items. This test consists of fifty short reading passages with multiple choice responses (i.e. student chooses one out of four responses which he or she deems correct and circles the appropriate response). Several questions relate to identifying the main idea and others to vocabulary. Individuals were given the stipulated forty minutes in which to complete the PEP test. Prior to the commencement of the test students were presented with two practice examples and were guided through then with the experimenter. Students were encouraged to check their answers, which is a metacognitive skill in itself. Each individual test was marked according to instructions set out in the PEP test. Thirty minutes were allotted precisely for the actual testing.

The total raw scores (the number of correct answers) were converted to centile rank norms as contained in the norms section of the handbook. The score obtained by an individual was used as the best estimate of his/her true score. To allow for the probable error in estimation, limits were defined within which the corresponding true

score probably lies. The probability relationship between obtained score and true score is such that in approximately two cases out of three an obtained score lies within a range (+ -) of the corresponding true score. The standard error of measurement to define limits around the observed centile rank within which the true centile rank would be found. In order to allow for the presence of score error, norms in the NSW Primary Evaluation Programme are presented as centile rank ranges. This practice is intended to ensure that the presence of score error is not overlooked. The norm tables enable teachers to compare each child's performance with that of norming population and as such constitutes an external validity measure.

A motivational questionnaire was another instrument used in this study. This was the Self-Regulation Questionnaire (SRQ) devised by (Connell & Ryan, 1985). The students responded to the items on a four-point scale comprising: "usually", "often", "sometimes", "almost never" and "don't know" ("don't know" was not attributed an influencing score in the scale). The first step in scoring the questionnaire was to obtain the mean value for all of the items that comprised a given subscale. After computation of the seven level scores, means were then computed for the four Self-Regulatory Styles in accordance with procedures specified by Ryan and Connell (1985). To obtain the External score, the means of scores for levels (subscales) one and two were combined. To obtain score for the Introjected style, the means of levels three, four and five were computed. The score for Identified is equal to level six. Level seven gives the Intrinsic style. Thus scores for 7 levels and 4 self-regulatory styles were obtained. In this study the scores were used to divide the students into "types" (external, introjected, identified or intrinsic) according to their predominant style of self-regulation in the classroom setting. This was done by by computing a weighted score by combining the four uncorrected scores. The External scale was multiplied by -2, the Introjected scale by -1, the Identified scale by 1 and the Intrinsic scale by 2. These weighted scores were then added to compute an index of self-regulation

following the procedure devised by Ryan and Connell (1985). This consisted of twenty questions emphasising four motivational patterns - extrinsic, identified, introjected moving to intrinsic motivational patterns.

Advance notice of the PEP reading test and motivational questionnaire was given so that teachers could allow time for students to be released in order to participate in the pretest assessments. All tests were administered in the morning when the students were more alert. Attempts were made to avoid any feeling of strain on the part of the students by treating the testing as a normal school activity and not as a special event. Students were nevertheless encouraged to make their best effort. Students were prevented from copying from each other by sitting at a desk by themselves.

The final measure used as both a pre and posttest measure was a behavioural questionnaire which was constructed by the experimenter to ascertain teacher evaluations of student classroom behaviours before and after the intervention. Increased active participation in class following the reciprocal teaching method was among the possible outcomes of the interventions to be evaluated. The importance of enhancing student participation in the school setting for at-risk students has been strongly urged by Finn and Cox (1991).

The Student Participation Assessment questionnaire was devised by the experimenter and was completed by the classroom teacher for each student prior to and following the study in which the students were involved. A tick was placed below one of the five categories (ranging from "always" "usually" "sometimes" "usually not" to "never") seen as appropriate following observation of the student within the actual classroom. Four scales were devised as follows: Effort scale, Compliance scale, Initiative scale, Participatory scale. There were fifteen statements devised. All the statements were mixed as were the items belonging to the four scales. Values were given to the 5

categories (i.e. "always" = 5; "usually" = 4; "sometimes" = 3; "usually not" = 2; "never" = 1). (This measure is included in Appendix 6).

Following the pretests, the two experimental groups (ET/RT and RT only) participated in the intervention. A daily form of assessment was given to these groups. After the reciprocal dialogue sessions, students were given a comprehension task with ten questions to answer. Students were to complete the task individually and were given ten minutes in which to do so. The topics in the daily comprehension passages varied but were of a general scientific nature. The students had little or no previous instruction in these content areas. The length, structure, and type of paragraphs were varied, as each of these characteristics could influence a student's ability to identify the main idea (Stevens, 1988). During the reciprocal teaching sessions the paragraphs progressed from shorter, easier paragraphs to longer, more complex paragraphs and ranged in length from 92 words to 175 words. A variety of expository paragraph types were used; descriptive, comparative, sequential, causal (Meyer et al, 1980; cited in Stevens, 1988). Different paragraph structures were employed so that students would be able to identify the main idea of a paragraph regardless of its structure. Paragraphs were written with and without explicit topic sentences. Paragraphs with topic sentences were varied so that the topic sentence occurred at the beginning, middle or end of the paragraph. Changing the length, structure and type of paragraphs not only removed any potential confounding due to these variables but also was designed to improve the potential generalizability of these comprehension skills to the students' other reading experiences (Stevens, 1988).

Progress was measured not only by observable changes in the students' participation in the discussions, but also by repeated independent tests of their actual understanding of novel passages, itself a form of transfer (Brown, et al, 1991). For daily assessments approximately 45 shorter passages were used, which were considerably

shorter in length than passages used in the reciprocal teaching sessions. Both the ET/RT and R/T only groups used the same passages, with the ET/RT groups engaged in five fewer reciprocal dialogues than their R/T only counterparts due to their involvement in the five day explicit teaching of the four comprehension strategies prior to actual reciprocal teaching sessions.

A critical feature of reciprocal teaching is the dialogue between the student teacher and other students which is used as the primary means for communicating the cognitive strategies. In the actual dialogue all students were encouraged to participate by assisting, elaborating upon or offering a new summary; asking questions to the group appertaining to the material previously read by the group; offering or commenting upon predictions given; asking for a word to be clarified; and helping settle misunderstandings. The reciprocal dialogues formed the basis of a qualitative assessment of students' development of reading comprehension fostering and monitoring skills. Students in the ET/RT and RT only conditions had their reciprocal teaching sessions taped. RT only were taped on days four, eleven and nineteen and the ET/RT reciprocal dialogues were recorded on days three, nine and fifteen (as these students had one week of explicit teaching and hence had one week less of reciprocal dialogues). Two paragraph readings were recorded for each group. The experimenter attempted and was mostly successful in recording each student in the role of group leader by the eighteenth session. The tape recorder was placed on the desk opposite the students. The tape recorder was present throughout all the sessions, so as the students were accustomed to its presence when actual taping proceeded. Evidence of use of the four strategies was sought, particularly the development of these skills through the fourth to nineteenth sessions. (Examples of reciprocal dialogues for the ET/RT and RT only groups are included in the Appendix 5).

As part of the posttest measures, the students completed the PEP reading test and the

same motivational questionnaire and behaviour participation questionnaire as in the pretest. Procedures for administration were similar to the pretest. Students were given exactly the same time to complete both posttest measures as was given in the pretest stage.

Reciprocal teaching involves teaching students specific cognitive strategies (usually summarisation, prediction, clarification and questioning), which can then be utilised with different texts, (Stevens, 1989). Six weeks following the ending of the study a social studies session was the focus for a comprehension style passage with ten questions relating to the text. The ET/RT, RT only and Control groups answered the questions. The reading passages were given by the actual classroom teacher to all the students in the class, but were marked by the experimenter. Twenty minutes were allotted to complete the assessment.

Statistical Analysis Procedures For Testing Hypotheses

Results from the tests and both questionnaires were gathered prior to and following the RT only and ET/RT sessions so as to ascertain any differential effects of the training conditions. Both the ET/RT and RT only groups were taught by the experimenter. The type of research design employed in the present study is a quasi-experimental design. This design changes the value of the independent variable, and then the effect this change has on the dependent variable is observed or measured. The independent variable in this experiment was the stimulus of the teaching of four reading comprehension strategies via the reciprocal teaching method. The dependent variable was the response i.e. the results of the PEP reading test, motivational questionnaire and behavioural questionnaire *after* the learning and employing of the four reading comprehension strategies.

The process of observation or measurement in this case was a PEP reading test, reading passages with ten questions (ET/RT group = 15 passages; RT only group = 20 passages), a motivational questionnaire, a behavioural questionnaire for teachers to complete and a social studies maintenance test undertaken six weeks after the intervention had finished. These measures were selected so an analysis of data could be conducted to see whether there was a significant improvement in metacognitive and cognitive reading strategies as well as a move towards internalised motivational patterns, development of more appropriate classroom behaviours as deemed by the classroom teacher and the maintenance of metacognitive and cognitive skills after a specified period of time (six weeks). If a marked improvement occurred, then quantitative and qualitative data could be used to assess whether this improvement could be interpreted as being due to the intervention (method).

The quantitative analysis of the data was undertaken using analysis of variance (ANOVA) on the SPSS statistical package. This type of data analysis was used as detailed examination of individual means as opposed to sets of means was the main focus. ANOVA is a statistical technique that is used to test the null hypothesis which suggests that the means of the specified populations being studied are all equal. The null hypothesis being tested was the the different groups (experimental and control) have the same means for all dependent variables (posttest measures). Using the ANOVA, detailed analysis of population means for all of the categories of a factor were undertaken as well as analysis of any interaction between two factors.

Twenty minutes were given to complete the motivation questionnaire. The total scale score (which was arrived at by summing the scores of each question in that particular scale) was used in an analysis of variance (ANOVA). This investigated the extent of variations in score and variations in motivation between groups.

The qualitative analysis of the data took the form of transcripts taken from both ET/RT and RT only groups (examples are included in Appendix 5). Cohen and Manion (1992) argue that this approach provides a comprehensive record of classroom behaviour, in this case of development of reading comprehension fostering and monitoring skills. Students attempts to appropriately use of the four reading comprehension strategies were recorded in beginning, middle and final reciprocal sessions. Specifically, when students spontaneously attempted main idea summaries, literal and non-literal questions, predictions as related to text content and awareness of when to implement the clarification strategy this was interpreted as the development of metacognitive and cognitive reading comprehension strategies. Increased participation in reciprocal dialogues through assuming the role of an active group leader when requested and increased participation as a member of the group indicated by asking questions, requesting words to be clarified, supporting the group leader in formulating a main idea summary, discussing perceived anomalies in the text, providing feedback to peers and relying less on the experimenter's support and prompting when attempting to implement a strategy.

CHAPTER SIX.

RESULTS

QUANTITATIVE ANALYSIS OF DATA

1. Reciprocal Teaching

The initial hypothesis predicted that both ET/RT and RT only experimental conditions would improve in reading comprehension over the period of the intervention. It was further hypothesised that both experimental groups would show greater improvement in a standardised reading test (PEP) compared to the control group. PEP posttests were carried out in the week immediately after the intervention period (week 4). Results were analysed firstly using an analysis of variance (ANOVA) and then a multiple regression analysis was done to create residuals so as these residuals could further be analysed using a oneway ANOVA. An alpha level of $p < .05$ was accepted as statistically significant. This procedure identified a significant difference between groups [$F_{(2,63)}=32.29$, $p < .001$] (Table 6.2). These effects for group were predicted in the hypothesis that the PEP reading scores will improve from pretest to posttest for all but the control group and the ET/RT group will improve the most.

An analysis of variance, using pretest performance (PEP1) as a covariate, was first performed on the data to see whether there were any differences between groups at the pretest stage. Using this method, the covariate was assessed first, with main effects (groups) being assessed after adjusting for the covariate. Significant results indicated differences in performance between groups on adjusted PEP scores [$F_{(2,62)}=33.45$, $p < .001$]. Details of the ANOVA test are presented in Appendix 7.

Investigation of group means (Table 6.1) indicates that there was an initial difference between the groups, with the control group scoring much less than both the ET/RT and RT groups' on average at the pretest stage. The figures also suggest an improvement in performance related to the experimental groups, and not the control group.

Table 6.1. PEP Test Mean Scores And Standard Deviations.

Group		Pretest	Posttest
ET/RT	mean	19.27	53.36
	(SD)	(8.56)	(22.33)
RT only	mean	21.14	43.23
	(SD)	(14.53)	(20.70)
Control	mean	15.45	18.55
	(SD)	(8.03)	(9.20)
Total	mean	18.62	38.38
	(SD)	(10.88)	(23.32)

Due to the fact that PEP1 scores were significantly different between groups we needed to find a model which best represented the data. Multiple regression analysis of pretest and posttest measures, with posttest performance (PEP2) as the dependent variable, was used to generate a regression model and from this a new regression residual was found (Appendix 8). The new variable created (PEPGAIN), represented the change in performance from PEP1 to PEP2 scores adjusting for initial pre-differences in levels of performance between the groups. This new variable (PEPGAIN) was then used as the dependent variable in further analysis.

The equation for the regression line in our sample (that is, the equation for the line of best fit) is given by PEP2 = 10.88 + 1.48 PEP1 (obtained from Appendix 8). We could use this equation to predict PEP2 for any subject, based on PEP1. The constant value (10.88) is the PEP2 score we would predict for someone who scored zero in PEP1. The slope or regression coefficient (1.48), tells us the predicted differences in PEP2 for differences in PEP1. The slope is a positive one which shows us that the relationship between PEP1 and PEP2 is positive. For each additional mark in PEP1, we would predict an additional 1.48 marks in PEP2. It is important to take into consideration that this is not group specific so nothing can be said about each group as the regression line represents all of the groups as one set of data.

How well does this regression line fit the data, that is, how well would the predictions match the observed scores if we used the regression equation to predict PEP2 for each subject in the sample, based on PEP1? Multiple R ($\underline{R}$) represents the correlation between the PEP2 scores we would predict using our regression equation and the PEP2 score actually observed for each subject (i.e. the amount of scatter about the straight line which best fits the data). In this case $\underline{R} = 0.69$, and this is significantly different from zero [$\underline{F}(1,64)=57.76$, $\underline{p} < .001$] (Appendix 8). This shows that there is a significant relationship between PEP1 and PEP2, i.e. PEP1 is a significant predictor of PEP2. The effect size ($\underline{R}^2 = 0.47$ - from Appendix 8) shows us that our linear regression model explains 47% of the variation in PEP2 scores between subjects.

After this model was fitted to the data, we took the 'left overs', that is, the difference between the observed value and the value predicted by the model, and created a new variable from this residual named PEPGAIN which represented the change in performance from PEP1 to PEP2 scores adjusting for initial pre-differences in levels of performance between the groups. We did this so as we could account for the other 53% of the variation in PEP2 scores which could not be explained by our linear

regression model. Oneway analysis of variance with this regression residual as a dependent variable by group showed that these residuals were significantly different from one another between groups [$F(2,63)=32.29$, $p < .001$] (Table 6.2 - obtained from Appendix 9). Therefore we can reject the hypothesis that all population means are equal. It appears unlikely that the students in the three groups obtained the same mean score.

Table 6.2. Analysis Of Variance Of PEPGAIN Residual By Group.

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	9408.77	4704.39	32.29	.0000
Within Groups	63	9177.59	145.68		
Total	65	18586.36			

The significant F statistic indicates only that the groups' residual means are probably unequal. It does not pinpoint where the differences are. To determine which groups' means are different from one another we used the Tukey multiple comparison test (*Honestly significant difference* - $p < .05$). This test showed significant differences between all three groups - the control group's residual means were significantly different from the RT and ET/RT groups' residual means - the RT significantly different to the control and ET/RT - and the ET/RT significantly different to the control and RT (see Appendix 9 for complete table of results). When comparing the residual means (we do this to take into account the levels of pre-performance) we can see that the ET/RT group gained the most ($M = 14.02$). The RT only group gained an average of 1.13 while the PEPGAIN value for the control group was actually negative (-15.16) (Appendix 9). Therefore it appears that the ET/RT and RT groups both

improved in PEP reading scores from pretest to posttest while the control group did not. Furthermore, the ET/RT group showed a greater improvement than the RT only group. The differences in actual mean scores are depicted in Figure 6.1.
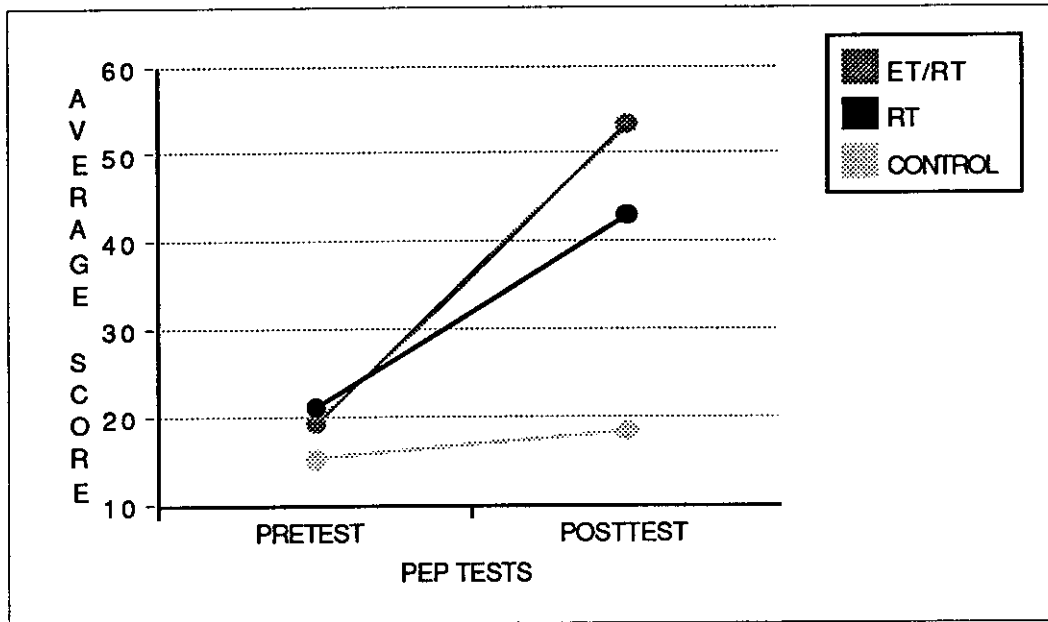
Figure 6.1. Average PEP Scores For Each Group At Pretest And Posttest.

The ET/RT group not only scored higher than the RT group on average but also improved more (ET/RT improved by 34.1 on average and RT improved by 22.1 on average) (from Table 6.1). Both the ET/RT and RT groups' posttest scores were higher than the control group's scores which improved by just 3.1 on average. Although a higher mean would tend to produce a higher deviation from it, the rise in standard deviations in both the ET/RT and the RT groups (from SD = 8.56 to 22.33 and SD = 14.53 to 20.70 respectively) suggests that certain students benefited more than others *within* the two groups. Future research into what sorts of academically at-risk students benefit more from ET/RT and RT only would prove fruitful in determining the application of the two intervention strategies with at-risk students.

2. Explicit Teaching Before Reciprocal Teaching

The second hypothesis suggested that both the ET/RT and RT only groups would improve scores on the daily reading comprehension passages (text followed by ten questions). Further, it was hypothesised that the ET/RT group would improve more than the RT only group. Daily reading comprehension passages were examined for the ET/RT and RT only conditions as the control group did not experience reciprocal teaching. A oneway ANOVA was firstly employed to look for significant differences at the pretest (day 1) stage. A repeated measures ANOVA was performed to compare results after the first, second, third and fourth weeks. Both the ET/RT and RT only groups improved their average weekly scores from week 1 to week 4 but the ET/RT group did not improve more than the RT only group.

An ANOVA procedure found no significant differences between groups on day 1 $[F(1,42)=0.30, p > .86]$ (Appendix 10). Due to this fact, weekly performances could be directly compared. A repeated measures ANOVA over four weeks was used to compare weekly performances.

When examining the effect on both groups over time we discover that both groups scores did differ significantly over time [Pillais $F(3,40)=43.86, p < .001$] (Appendix 11). Not only was there a significant difference from day 1 to the end of week 4 but significant differences could also be shown from week to week (Table 6.3 - obtained from Appendix 11).

Table 6.3. Repeated Measures ANOVA For Week 1 To Week 4 For Both Et/Rt and
RT only groups combined.

Period	F (1,42)
week 1 - week 2	102.64**
week 2 - week 3	42.63**
week 3 - week 4	9.21*

* - indicates a significant difference at the p<.05 level
** - indicates a significant difference at the p < .001 level

These significant differences from week to week did not vary for the two groups
[F(3,126)=0.18, p > .91] (Appendix 11).

A table containing the means and standard deviations for each group across the four
week period is shown in Table 6.4.

Table 6.4. Weekly Average Scores Of Two Experimental Groups.

	Day 1	Week 1	Week 2	Week 3	Week 4
ET/RT mean	27.50	34.59	52.86	54.82	58.45
(SD)	(15.79)	(14.77)	(15.41)	(19.56)	(21.42)
RT only mean	26.50	26.82	45.00	49.36	51.73
(SD)	(21.79)	(14.63)	(19.45)	(19.51)	(20.72)

These mean scores are graphed in Figure 6.2 on the next page.
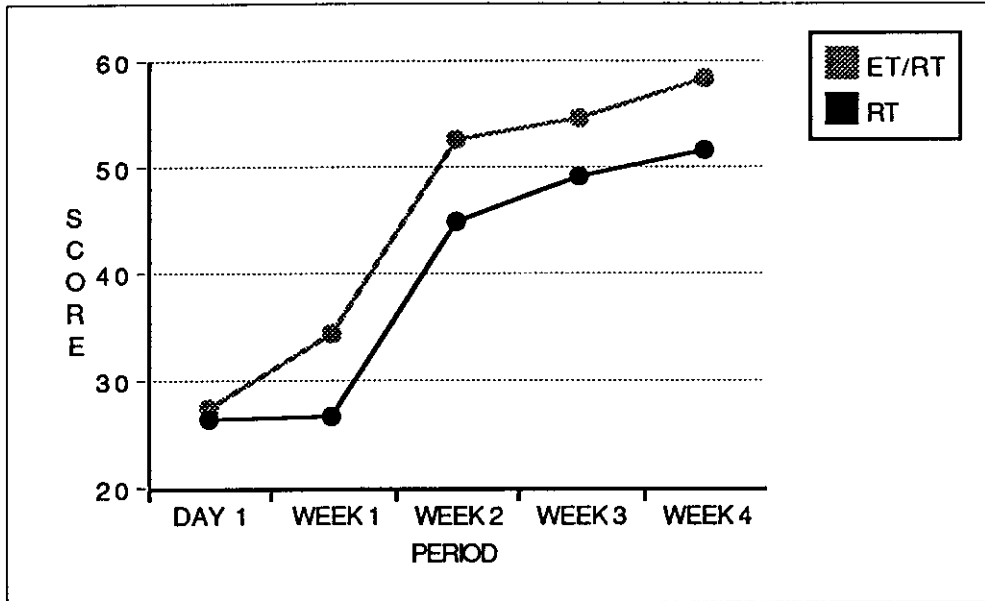
Figure 6.2. Average Reading Comprehension Scores (/100) By Weeks

When comparing the two groups in Figure 6.2 we can clearly see a marked improvement in the average weekly scores for both groups. The ET/RT group improved from a mean of 27.50 on day 1 to 58.45 in week 4, an improvement of 30.95 on average. The RT group also improved at a similar level starting with a mean of 26.50 on day 1 and finishing with a mean of 51.73 in week 4, an improvement of 25.23 on average (from Table 6.4). The significant improvement in average scores continues from week to week throughout the four week period (Table 6.4).

It was hypothesised that the ET/RT and RT only groups would progressive ly diverge over the four week period. There was, however, no significant difference between the two groups over the four weeks [$F(1,41)=3.87$, $p > .05$] (Appendix 11). There was also no significant interaction of group by time, indicating that the two groups did not gain at different rates [Pillais $F(3,40)=0.23$, $p > .87$]. Therefore, contrary to prediction, the ET/RT group did not improve at a faster or higher rate as hypothesised when compared to the RT group. Both groups' average weekly scores run almost parallel to each other after week 1 (Figure 6.2). After the first week of

teaching, the ET/RT group's average scores were higher and remained higher by relatively the same margin throughout the study.

Visual inspection of trends in daily scores obtained on the comprehension passage-assessments, suggests that most of the increase in scores took place during weeks 1 and 2, between day 4 and day 8 (Figure 6.3). After day 14 the scores stay at around the same mark for both groups suggesting a plateauing out effect after this period in time, with the exception of day 20 where a marked decrease is evident. This graph also shows more variation in both groups from day to day accounting for individual differences within each group. What is also evident from this graph is the very substantial increase in scores during week 2 for *both* groups.
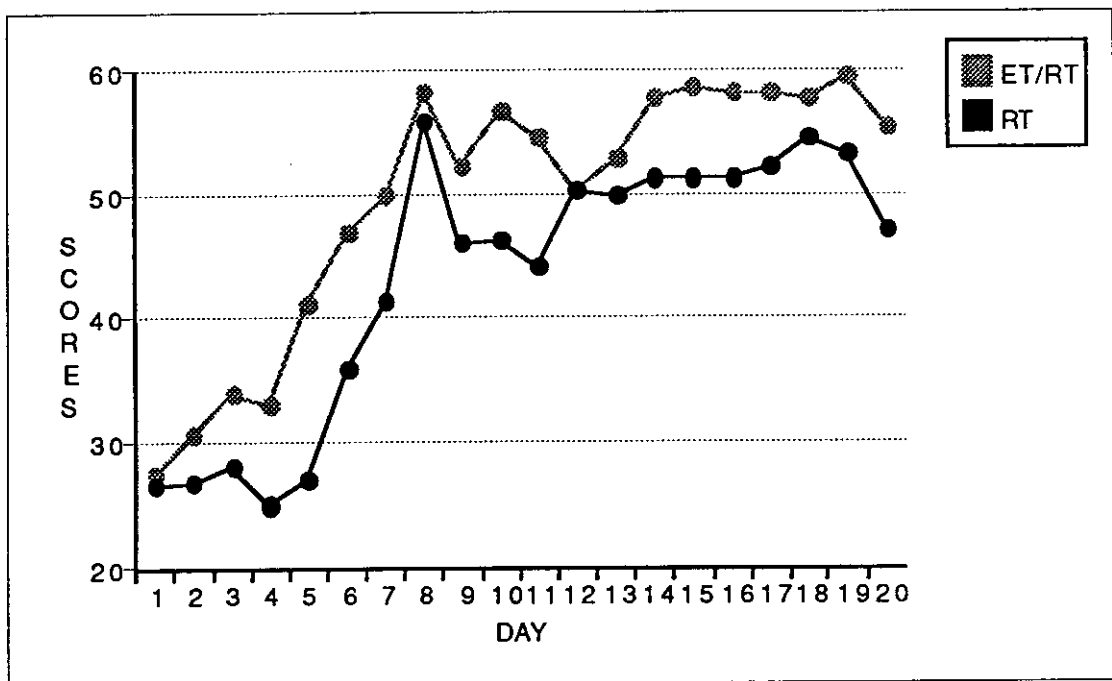
Figure 6.3. Average Daily Raw Scores Of All Students.

3. Maintenance

Could the strategies which our results showed to be quite effective, be maintained after a period of time without intervention? It was hypothesised that the reading comprehension social studies test administered in week 10 would show maintenance of enhanced comprehension outcomes when compared to the last week (week 4) of the reading comprehension passages for both experimental groups. It was further hypothesised that the ET/RT group would have maintained learned strategies at a higher level and thus achieve a higher performance level than the RT only group.

An ANOVA procedure was used to test the hypothesis that the means between the groups were not significantly different at week 4. ANOVA indicated that the scores obtained differed significantly between the two experimental groups at week 4 [$F(1,41)=10.39$, $p < .05$] (Appendix 12). Therefore we cannot reject the hypothesis that the groups means are unequal. A table showing means and standard deviations is shown in Table 6.5.

Group		Week 4	Week 10
ET/RT	mean	58.45	55.91
	(SD)	(21.42)	(21.76)
RT only	mean	51.73	44.55
	(SD)	(20.72)	(22.14)

Table 6.5. Reading Comprehension Test Mean Scores And Standard Deviations.

Due to the fact that week 4 scores were significantly different between groups we needed to find a model which best represented the data. Multiple regression analysis of pretest and posttest measures, with posttest performance (Social Studies, or as we

shall refer to it - week 10) as the dependent variable, was used to generate a regression model and from this a new regression residual was found (Appendix 13). The new variable created (SSNRESID), represented the change in performance from week 4 to week 10 adjusting for initial pre-differences in levels of performance between the groups. This new variable was then used as the dependent variable in further analysis. This approach is the same as the focus of the ANOVA procedure used in testing hypothesis I.

The equation for the regression line in our sample is given by WEEK 10 = - 3.81 + 0.98 WEEK 4 (obtained from Appendix 13). The constant value (-3.81) is the week 10 score we would predict for someone who scored zero in week 4. The slope or regression coefficient (0.98), tells us the predicted differences in week 10 for differences in week 4. The slope is a positive one which shows us that the relationship between week 4 and week 10 is positive. For each additional mark in week 4, we would predict an additional 0.98 marks in week 10.

Multiple R ($\underline{R}$) represents how well this regression line fits the data. In this case $\underline{R}$ = 0.97, and this is significantly different to zero [$\underline{F}(1,42)=610.36$, $\underline{p} < .001$] (Appendix 13). This shows that there is a significant relationship between week 4 and week 10 i.e. week 4 is a significant predictor of week 10. The effect size ($\underline{R}^2 = 0.94$ - from Appendix 13) shows us that our linear regression model explains 94% of the variation in week 10 scores between subjects. It is a very strong predictor.

A new variable was created from the residuals after the model was fitted to the data. It was named SSNRESID and represented the change in performance from week 4 to week 10 scores adjusting for initial pre-differences in levels of performance between the groups. Oneway analysis of variance with this regression residual as a dependent variable by group showed that these residuals were significantly different from one

another between groups [$F(1,42)=10.30$, $p < .05$] (Table 6.6 - obtained from Appendix 14). The two groups differed on week 10 results when adjusted for week 4. Therefore the two groups differed in maintenance. From examination of the means, it is clear that the ET/RT group maintain more of their learned strategies than the RT only group.

Table 6.6. Analysis Of Variance Of SSNRESID Residual By Group.

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	249.7670	249.7670	10.3007	.0025
Within Groups	42	1018.4009	24.2476		
Total	43	1268.1679			

The ET/RT group went from a mean score of 58.5 in week 4 to 55.9 in week 10 whereas the RT only group went from a mean score of 51.7 in week 4 to 44.5 in week 10. These were drops of 2.6 and 7.2 respectively - quite small when compared to how much they both gained in the first four weeks (30.95 and 25.23 respectively). This suggests that the ET/RT group maintained their learned strategies at a higher level than did the RT only group. These results are depicted in Figure 6.4.
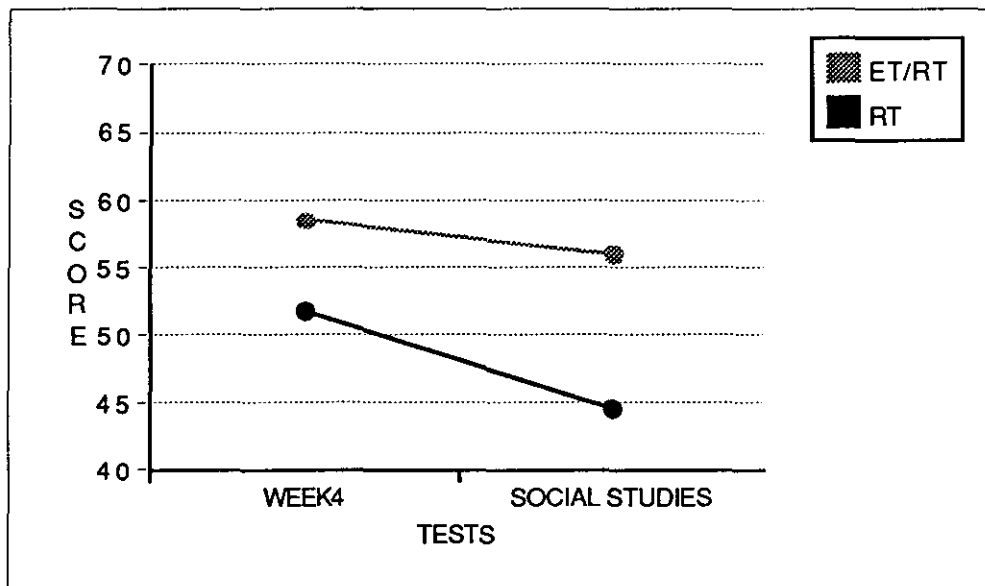
Figure 6.4. Week 4 Scores Compared To Reading Comprehension Social Studies Scores For Both Experimental Groups

There is a slight drop in average scores from week 4 to week 10 as discussed previously for both groups. When examining average results on a time-scale from week 1 to week 10 when the social studies test was done, this drop seems rather minor - remembering that there was no explicit teaching of the strategies that they learned from week 4 onward. This can be shown in Figure 6.5.
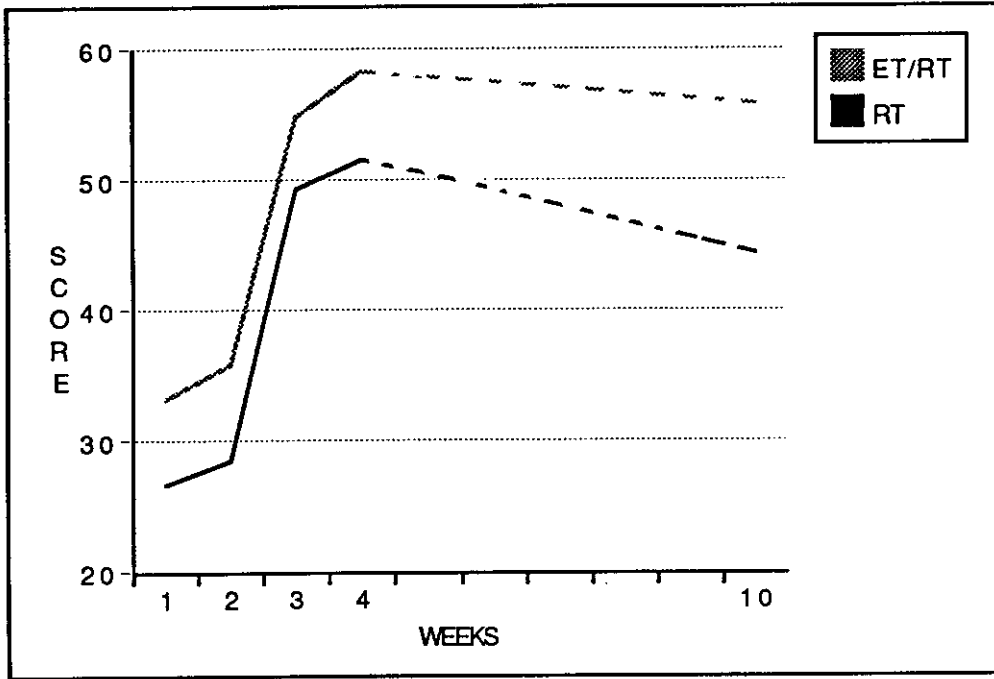
Figure 6.5. Reading Comprehension Scores Over 10 Weeks For Both Experimental Groups.

From examining the results in this graph it is clear that there was maintenance of test scores in both groups with the ET/RT group maintaining a higher level, that is not dropping off as much, than the RT only group.

4. Motivation

It was predicted that the motivation questionnaire would demonstrate improvement from pre- to posttest for the ET/RT and RT only groups and not for the control group. In addition, it was anticipated that the ET/RT group would show higher motivation levels than the RT only group. Data obtained from the motivation questionnaire were analysed using the ANOVA procedure, by examining mean scores at pre- and posttest stages in extrinsic, introjected, identified and intrinsic motivation levels, representing a move away from extrinsic motivation.

The figures presented in Table 6.7 indicate several important features concerning the data obtained from analysis of scores on this questionnaire (a more detailed summary of results is given in Appendix 15).

Table 6.7. Analysis Of Variance For Measures Of Motivation.

Scale		n^2	F	p
Extrinsic	Pre	0.13	4.79	0.01*
	Post	0.04	1.44	0.24
Introjected	Pre	0.08	2.82	0.07
	Post	0.01	0.45	0.64
Identified	Pre	0.11	3.87	0.03*
	Post	0.00	0.10	0.90
Intrinsic	Pre	0.15	5.36	0.01*
	Post	0.02	0.59	0.56
Self - reg	Pre	0.01	0.44	0.65
	Post	0.03	0.98	0.38

* - indicates a significant difference at the $p < .05$ level

Eta squared (n^2) is the ratio of the between groups sum of squares to the total sum of squares. It represents the proportion of the total variance in scores attributable to differences among the groups (i.e. it is a measure of the strength of a relationship). The larger values of n^2 are associated with functions that have much variability between groups and little variability within groups.

Table 6.7 shows that for the extrinsic motivation scores, the variability in scores cannot be attributed to differences among the groups so much as differences within the groups. A pretest n^2 value of 0.13 shows that only 13% of the variation in scores can be explained by differences between groups - not a very strong relationship. The posttest value of $n^2 = 0.04$ was more substantial in that it showed even more variability within groups and less variability between groups than the pretest measure which is not what one would expect. The remaining 4 motivational scales also show very small variability between groups ($n^2 < 0.16$ in all cases) (Table 6.7). These n^2 values show that there was a very small portion of the variances in score which could be attributed to differences among the groups.

Each of the 5 motivation scales was investigated separately:

1. <u>Extrinsic Motivation.</u>

An ANOVA procedure showed significant differences between groups at the pretest stage [$F(2,63)=4.79$, $p < 0.05$], however, no significant differences between groups were depicted at the posttest stage [$F(2,63)=1.44$, $p > 0.24$] (Table 6.7). A further examination of the pre- and posttest mean scores for each group (Table 6.8) reveals that the pretest differences in scores were due to the fact that the control group's mean

is unexpectedly higher than both the RT and ET/RT groups' means (causing the significant difference). It was expected that all three groups would start at relatively the same level.

Group		Pretest	Posttest
ET/RT	mean (SD)	2.49 (0.96)	2.53 (0.77)
RT only	mean (SD)	2.58 (1.05)	2.82 (0.87)
Control	mean (SD)	3.25 (0.57)	2.92 (0.70)

Table 6.8. Extrinsic Motivation Mean Scores And Standard Deviations.

These mean scores are graphed in Figure 6.6.

Figure 6.6. Extrinsic Motivation Scale Scores For Each Group At Pre- And Posttest

A visual inspection of Figure 6.6 shows that the RT only group did improve its mean

score but due to the fact that there were pretest differences between groups (mainly the control group) the improvement cannot be attributed to the teaching intervention in that it could have happened by chance. There also seems to be a drop in the control group's score from pre- to posttest. When linking results obtained from the ANOVA and mean scores with what we can interpret from Figure 6.6 it appears as though there was no significant improvement *within* each group. Therefore no group improved significantly more than the other, although a significant drop in the control group's score does seem evident.

2. Introjected Motivation.

An ANOVA procedure showed no significant differences *between* groups at the pre- and posttest stage (see Table 6.7). Inspection of the pre- and posttest mean scores for each group (Table 6.9) indicates an improvement in average score by both the ET/RT and RT only groups. The control group does not seem to be affected from pre- to posttest.

Group		Pretest	Posttest
ET/RT	mean	2.59	2.87
	(SD)	(0.90)	(0.81)
RT only	mean	2.53	2.83
	(SD)	(1.03)	(0.92)
Control	mean	3.10	3.04
	(SD)	(0.63)	(0.58)

Table 6.9. Introjected Motivation Mean Scores And Standard Deviations.

These mean scores are graphed in Figure 6.7.
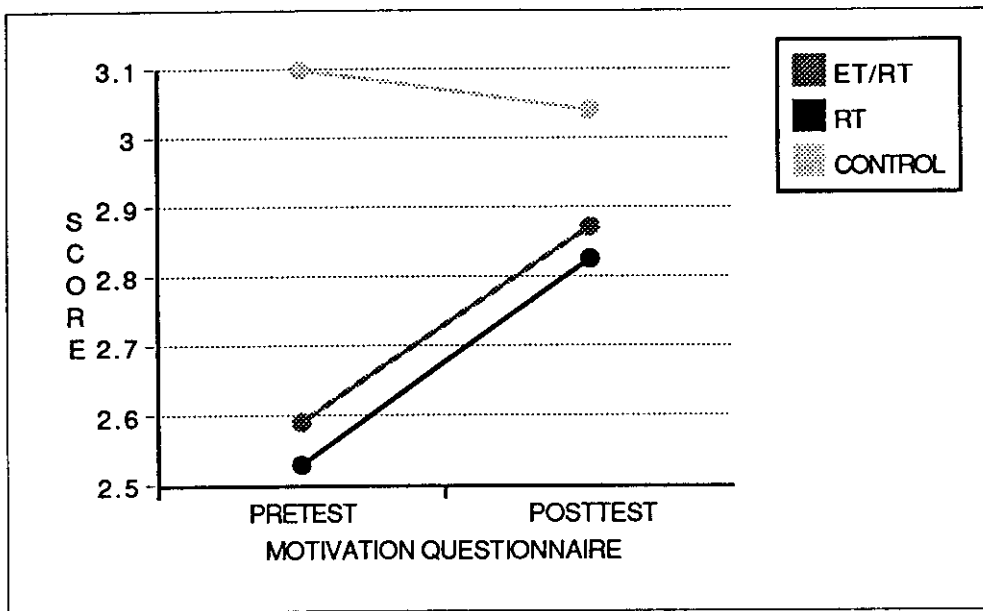
Figure 6.7. Introjected Motivation Scale Scores For Each Group At Pre-
And Posttest.

Looking at the range of mean scores between groups at the pretest stage and knowing

that this difference was not significant (from Table 6.7) it can safely be concluded that

the smaller range of scores from pre- to posttest stages within each group is also not

significant i.e. no significant difference from pre-to posttest scores is evident within

each group. Although some improvement is evident for both the ET/RT and RT only

groups it is not a significant one.

3. Identified Motivation.

This scale is similar to the extrinsic motivation scale in that the ANOVA procedure

showed significant differences between groups at the pretest stage $[F_{(2,63)}=3.87$,

$p < 0.05]$ but no significant differences between groups at the posttest stage

$[F_{(2,63)}=0.10$, $p > 0.90]$ (Table 6.7). Examining the pre- and posttest mean scores

for each group (Table 6.10) again reveals that the pretest differences in scores were

due to the fact that the control group's mean is unexpectedly higher than both the RT and ET/RT groups' means.

Group		Pretest	Posttest
ET/RT	mean	2.95	3.32
	(SD)	(1.24)	(0.83)
RT only	mean	2.98	3.24
	(SD)	(1.17)	(0.97)
Control	mean	3.70	3.21
	(SD)	(0.42)	(0.69)

Table 6.10. Identified Motivation Mean Scores And Standard Deviations.

These mean scores are graphed in Figure 6.8.
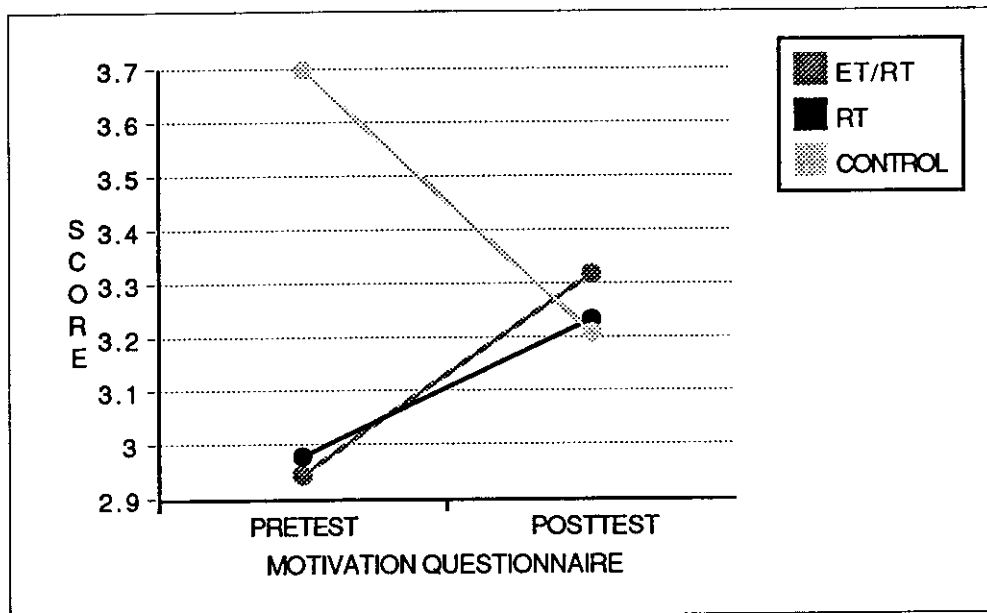
Figure 6.8. Identified Motivation Scale Scores For Each Group At Pre-
And Posttest.

A visual inspection of Figure 6.8 shows that the ET/RT and RT only groups both improved their mean scores but due to the fact that there were pretest differences between groups, we cannot attribute this improvement to the teaching intervention. There also seems to be a drop in the control group's score from pre- to posttest. It appears as though there was an improvement within the ET/RT and RT only groups but this improvement cannot be demonstrated to be significant. No group improved significantly more than the other, although a substantial drop in the control group's score does seem evident.

4. Intrinsic Motivation.

As was the case with the extrinsic and identified motivation scales, it is very difficult to show significant results due to the fact that groups were significantly different at the pretest stage [$F(2,63)=5.36$, $p < .05$] and were not at the posttest stage [$F(2,63)=0.59$, $p > .55$] (Table 6.7). Again it can safely be concluded that the control group caused this significant pretest difference by achieving an unusually higher mean score at the pretest stage when compared to the two experimental groups (Table 6.11.)

Group		Pretest	Posttest
ET/RT	mean	2.40	2.35
	(SD)	(0.90)	(0.98)
RT only	mean	2.26	2.59
	(SD)	(0.99)	(0.99)
Control	mean	3.10	2.65
	(SD)	(0.86)	(1.02)

Table 6.11. Intrinsic Motivation Mean Scores And Standard Deviations.

These mean scores are graphed in Figure 6.9.

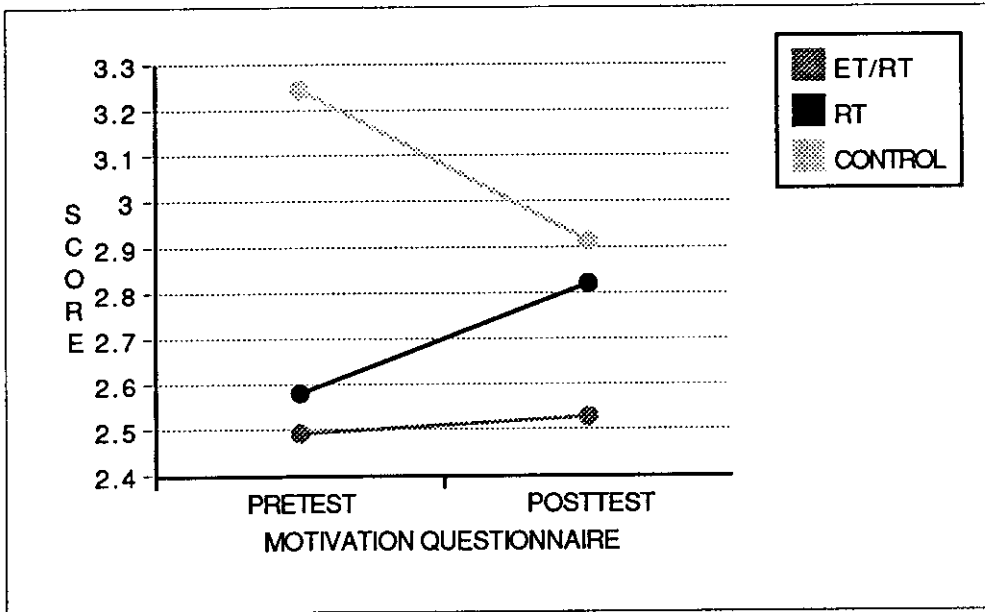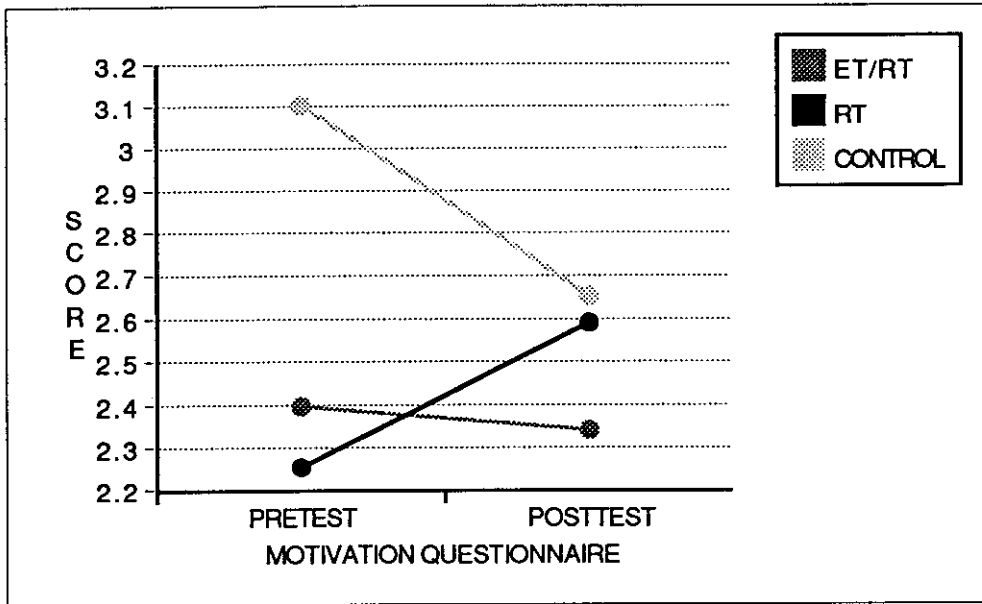Figure 6.9. Intrinsic Motivation Scale Scores For Each Group At Pre- And Posttest.

Due to pretest differences, no results could be interpreted as significant although a definite rise is evident in the RT only group's score while the control group seem to drop off dramatically from pre- to posttest as was the case with the other two motivation scales (extrinsic and identified) which showed significant pretest differences.

5. Self-regulatory Index.

This scale was used to summarize data across the four specific scales. An ANOVA procedure showed no significant differences between groups at the pretest stage [$F(2,63)=0.44$, $p > .64$] or posttest stage [$F(2,63)=0.98$, $p > .38$] (Table 6.7). A table of means and standard deviations for each group at pre- and posttest stages is shown in Table 6.12 on the next page.

Group		Pretest	Posttest
ET/RT	mean	0.17	0.07
	(SD)	(1.63)	(2.35)
RT only	mean	-0.19	-0.06
	(SD)	(2.17)	(2.29)
Control	mean	0.32	-1.12
	(SD)	(1.78)	(4.25)

Table 6.12. Self-regulatory Index Mean Scores and Standard Deviations.

Standard deviations from mean scores seem very high compared to the actual score obtained. It is not surprising that no significant differences between groups could be found. This is supported by previous findings of n^2 which showed that only a very small portion of score could be attributed to differences among groups. An investigation of group means at the pre- and posttest stages (Table 6.12) reveals yet again that the control group's mean score drops off dramatically from pre- to posttest stages. The RT only group improve by an average of 0.13 marks. The ET/RT group lost 0.10 marks on average from pre- to posttest. This rise and drop are not significant when we take into account that there were no significant differences between groups at the pretest stage and posttest means are even less scattered between the two groups. A line graph depicting this information is shown in Figure 6.10 on the next page.
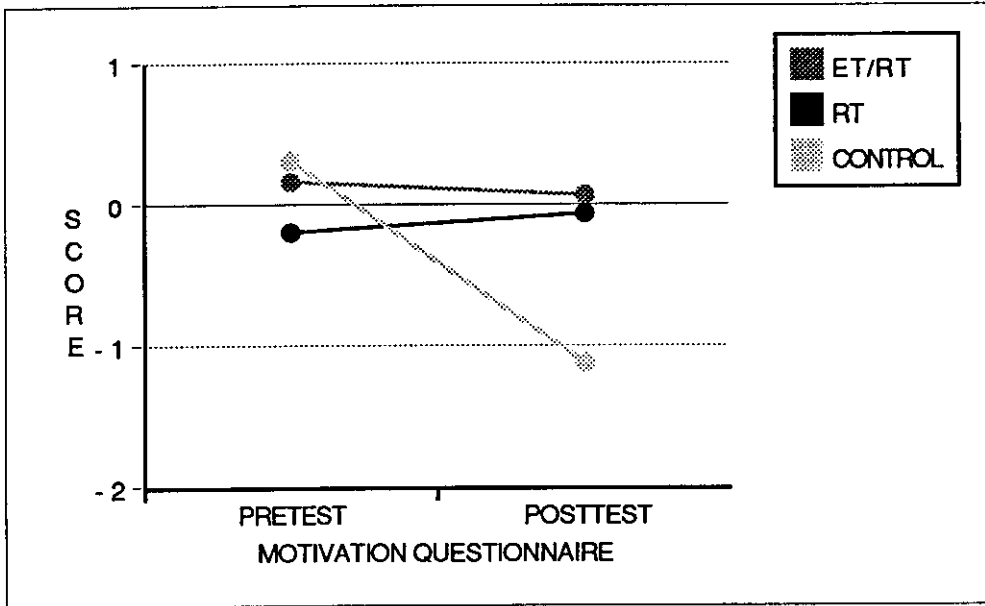
Figure 6.10. Self-Regulatory Scale Scores For Each Group At Pre- And Posttest.

5. Behaviour Questionnaire

More appropriate behaviour in the classroom as indexed by teacher ratings for both the ET/RT and RT only groups was expected to be manifest in the pre- to posttest behaviour measure. No change was expected for the control group. The one-way ANOVA procedure was used to test the hypothesis that the groups' means were different for each of the four scales. Results are presented in Table 6.13. (Refer to Appendix 16 for a more detailed summary of results).

Table 6.13. Analysis Of Variance For Measures Of Appropriate Classroom
Behaviour.

Scale		$\underline{F}$ (2,63)
Effort	Pre	32.26**
	Post	4.31*
Compliance	Pre	31.50**
	Post	1.65
Initiative	Pre	22.62**
	Post	1.31
Participation	Pre	16.15**
	Post	0.04

* - indicates a significant difference at the $\underline{p} < .05$ level
** - indicates a significant difference at the $\underline{p} < .001$ level

As can be seen from Table 6.13, the observed differences for all of the pretest scale scores were significant ($\underline{p} < .001$ in all pretest measures). We can therefore safely ascertain that group means were probably unequal at the pretest stage. We used the

Tukey HSD multiple comparison test (Tukey a) to determine which group means were significantly different from others at the pretest stage. Two findings were consistent across all four scales. They were -

i) The control group's scores were significantly different from both the ET/RT and RT only groups' scores at the pretest stage (Appendix 16).

ii) The ET/RT and RT only groups' scores were not significantly different from each other at the pretest stage (Appendix 16).

An investigation of mean scores (Tables 6.14 to 6.17) shows the extent of these differences. As was the case in the motivation scales, the control group's scores have started at a distinctly higher level than both the RT and ET/RT groups' scores on all four scales. This is consistent with what the Tukey a procedure shows. However, unlike the motivation scales where the control groups scores seemed to drop off dramatically, in this case the control group's mean scores stay relatively the same from pre- to posttest measures (refer to Tables 6.14 to 6.17), showing no change in classroom behaviour. Knowing that the control group's scores were the only ones significantly different (higher) from any other groups at the pretest stage allows us to compare postest findings to see whether the experimental groups' scores did in fact improve significantly by examiningposttest differences between groups.

The following is an account of the differences between groups at the *posttest* stages for each scale and what can be interpreted from these differences (analyses are presented in Appendix 16). The graphs depicting the mean scores for each scale are also shown.

1. Effort scale.

This was the only scale which showed significant differences between groups at the posttest stage [F(2,63)=32.26, p < .05] (Table 6.13). Tukey a (Appendix 16)

showed that the control group's scores were significantly different only from the RT group's scores. The control and ET/RT groups' scores were not significantly different as was the case in the pretest stage. From these results we can interpret that the ET/RT group's scores improved from pre- to postest stages in that there were significant differences initially from the control group's higher scores (at the pretest stage), but no significant differences from the control group's scores at the posttest stage. This shows that the ET/RT group had 'caught up' with the control group's initially significant higher scores. The mean scores for each group are presented in Table 6.14 and these mean scores are graphed in Figure 6.11.

Group		Pretest	Posttest
ET/RT	mean	14.36	19.00
	(SD)	(2.65)	(2.14)
RT only	mean	14.18	17.27
	(SD)	(1.84)	(3.20)
Control	mean	19.00	19.36
	(SD)	(2.20)	(2.08)

Table 6.14. Effort Scale Mean Scores And Standard Deviations.
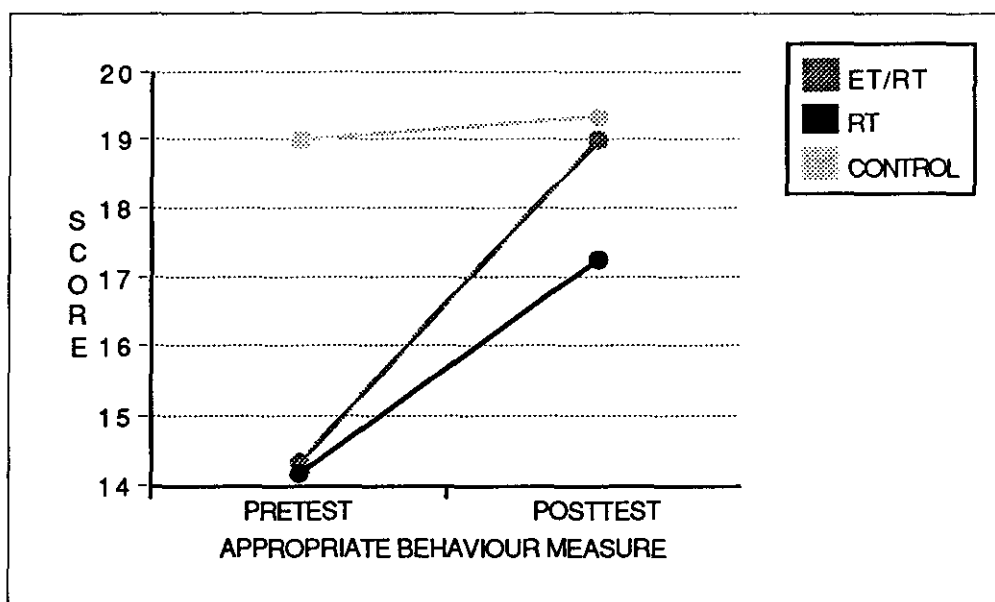
Figure 6.11. Effort scale mean scores for each group at pre- and posttest.

Taking into account the fact that the RT only group's scores were not significantly different from the ET/RT group's scores at the posttest stage (Tukey a, Appendix 16) and that the ET/RT group did improve significantly when compared to the control group and considering the extent and direction of this improvement (Figure 6.11) we can safely say that there was also a significant improvement in the RT only group's scores. However, the ET/RT group did not improve significantly more than the RT only group (i.e. no significant difference at posttest between the two experimental groups - Tukey a, Appendix 16).

2. <u>Compliance scale</u> :

No two groups were found to be significantly different at the posttest stage [$F_{(2,63)}=1.65$, $p > .19$] (Table 6.13). From these results we can interpret that the ET/RT and RT only groups' scores improved from pre- to postest stages in that there were significant differences initially with the control group's higher scores (Tukey a, Appendix 16), but no significant differences with the control group's scores at the posttest stage (Table 6.13). This shows that both experimental groups had 'caught up' with the control group's initially significant higher scores (Table 6.15). The ET/RT group did not improve significantly more than the RT only group because there were no significant differences between any two groups at the posttest stage. The mean scores for each group are presented in Table 6.15.

Group		Pretest	Posttest
ET/RT	mean (SD)	7.50 (1.87)	10.45 (1.84)
RT only	mean (SD)	7.23 (1.41)	10.14 (1.91)
Control	mean (SD)	10.91 (1.82)	11.14 (1.83)

Table 6.15. Compliance Scale Mean Scores And Standard Deviations.

These mean scores are graphed in Figure 6.12.
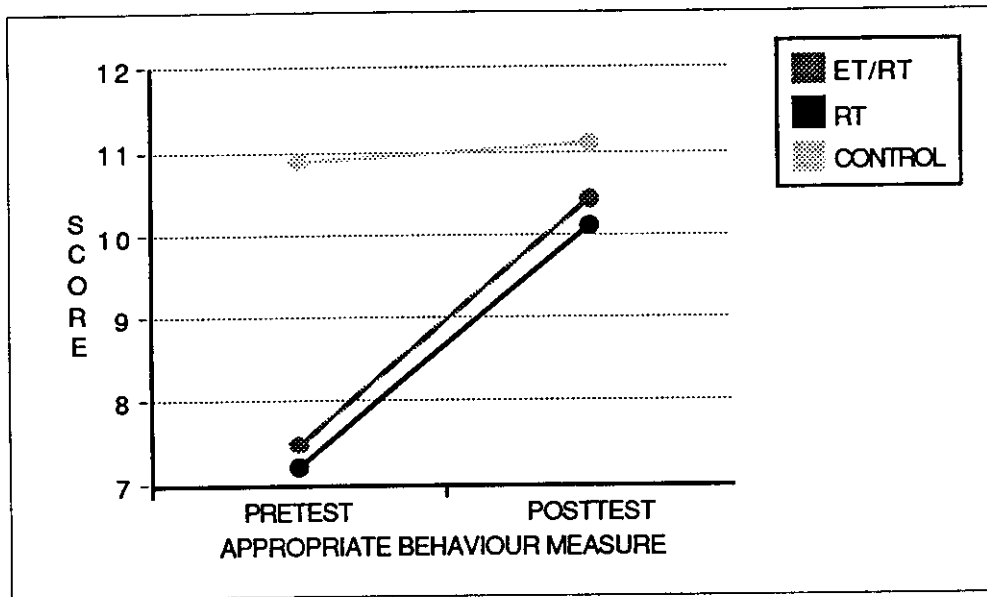
Figure 6.12. Compliance scale mean scores for each group at pre- and posttest.

3. Initiative scale :

As was the case with the compliance scale, no two groups were found to be significantly different at the posttest stage [$F(2,63)=1.31$, $p > .27$] (Table 6.13). From these results we can interpret that the ET/RT and RT only groups' scores improved from pre- to postest stages in that there were significant differences initially with the control group's higher scores (Tukey a, Appendix 16), but no significant differences with the control group's scores at the posttest stage (Table 6.13). This shows that both experimental groups had 'caught up' with the control group's initially significant higher scores (Table 6.16). The ET/RT group did not improve significantly more than the RT only group because there were no significant differences between any two groups at the posttest stage. The mean scores for each group are pesented in Table 6.16 and graphed in Figure 6.13.

Group		Pretest	Posttest
ET/RT	mean	9.41	12.05
	(SD)	(1.82)	(1.68)
RT only	mean	9.50	12.05
	(SD)	(1.57)	(1.86)
Control	mean	12.32	12.73
	(SD)	(1.49)	(1.24)

Table 6.16. Initiative Scale Mean Scores And Standard Deviations.
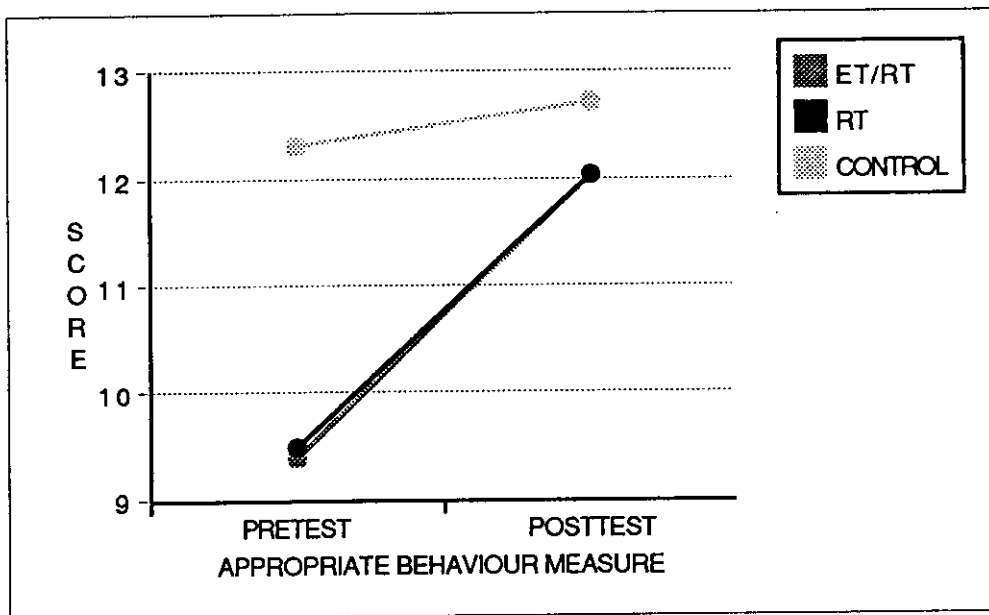
Figure 6.13. Initiative scale mean scores for each group at pre- and posttest.

4. Participation Scale :

As was the case with the compliance and initiative scales, no two groups were found to be significantly different at the posttest stage [$F_{(2,63)}=0.04$, $p > .96$] (Table 6.13). From these results we can interpret that the ET/RT and RT only groups' scores improved from pre- to postest stages in that there were significant differences initially

with the control group's higher scores (Tukey a, Appendix 16), but no significant differences with the control group's scores at the posttest stage (Table 6.13). This shows that both experimental groups had 'caught up' with the control group's initially significant higher scores (Table 6.17). The ET/RT group did not improve significantly more than the RT only group because there were no significant differences between any two groups at the posttest stage. The mean scores for each group are presented in Table 6.17 and graphed in Figure 6.14.

Group		Pretest	Posttest
ET/RT	mean	11.27	14.18
	(SD)	(2.29)	(2.30)
RT only	mean	10.77	14.00
	(SD)	(1.60)	(1.98)
Control	mean	13.95	14.09
	(SD)	(2.03)	(2.04)

Table 6.17. Participation Scale Mean Scores And Standard Deviations.
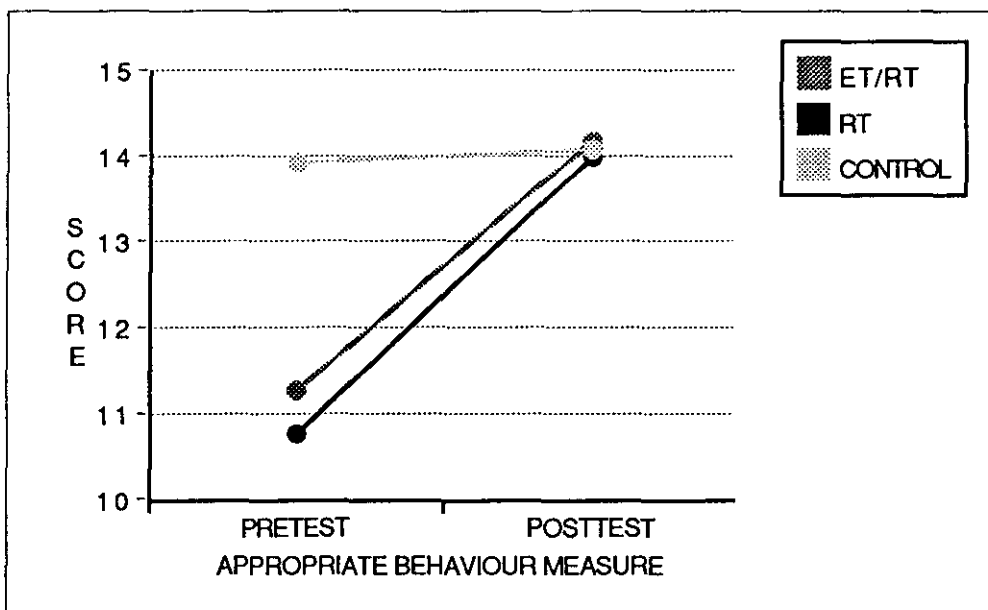
Figure 6.14. Participation scale mean scores for each group at pre- and posttest.

Summarising the above findings, the ET/RT and RT only groups did show significant improvement in their scores on all four scales. Due to the fact that there were pretest differences between the two experimental groups and the control group (but no differences between the experimental groups themselves) the significant improvement cannot definitely be attributed to the actual intervention. When all four scales are examined, the same pattern of results seems to be present. Therefore it appears as though the improvements were due to some intervention from pre- to posttest (especially when one considers the fact that the control group who experienced no intervention achieved the same scores from pre- to posttest measures on all four scales). It therefore appears unlikely that these improvements in score for both experimental groups were by chance although this cannot be ruled out. What can be elicited from the results is that there was a significant improvement. The ET/RT group did not, however, improve significantly more than the RT only group in any of the four scales as was hypothesised.

QUALITATIVE ANALYSIS OF DATA

Transcripts For Reciprocal Sessions For ET/RT And RT Only Groups

Qualitative analyses of students' development of reading comprehension strategies was also undertaken for both the ET/RT and RT only groups. It was hypothesised that students in both groups would begin to participate in reciprocal dialogues by making predictions, providing summaries, asking questions and where appropriate, asking for or making clarifications. Rosenshine and Meister (1994) suggest that summaries and questions are the most effective strategies in developing a deeper understanding of the text. Palinscar and Brown assert that students benefit most from reciprocal teaching when they participate in group discussions, particularly when they are team leaders. The cooperative features of reciprocal teaching are critical in developing metacognition as they externalise thinking and less proficient students can model strategies used by more capable students. Feedback is also an integral part of reciprocal teaching which encourages participation.

Furthermore it was anticipated that the ET/RT group would be able to create summaries when they were given few clues from the text, to formulate questions more often than the RT only group which evoked strategic thinking (by using the question stems on a frequent basis), to ask for and give clarifications when required and make appropriate predictions at an increased rate compared to the RT only groups. This contention was based on the expectation that the ET/RT groups' initial week of explicit teaching of the 4 reading comprehension strategies would assist them in more effectively applying the strategies to designated tasks as their conditional and procedural knowledge would have been enhanced (Borkowski et al, 1989).

Students were appraised then as being successful in developing reading

comprehension fostering and monitoring skills, when they were able to generate summaries, formulate questions especially when they used the question stems on the cue cards (refer to Appendix 2), give clarifications and predictions where appropriate and when they actively participate in reciprocal discussions. In summation, students were assessed as having developed reading comprehension fostering and monitoring skills when they began to process the text at a deeper level, to engage in making sense of what they read, to gain awareness of their own misunderstanding of the text and to engage in additional reading when they did not understand something in the text.

The RT only groups were recorded as they participated in reciprocal dialogues on days 4, 11 and 19 of the reciprocal teaching intervention. The ET/RT group did not have the same number of reciprocal sessions as the RT only condition as they experienced a week of explicit teaching of the four reading comprehension strategies prior to reciprocal teaching sessions. Hence the ET/RT groups had 15 days of reciprocal intervention and were subsequently recorded on days 3, 9 and 15. Examples of recorded transcripts and analysis in relation to the development of reading comprehension metacognitive strategies for these days are given below for both the ET/RT and RT only groups. Students initially began with short, unrelated paragraphs and as the sessions progressed they experienced more thematic expository texts. Examples of transcripts have been presented in a manner which offers a clearer insight into the development of reading comprehension fostering and monitoring skills in reciprocal dialogues. That is, by providing transcript examples which utilised the same isolated paragraphs in the beginning of the reciprocal sessions culminating in thematic paragraphs for both groups in the final sessions. Examples of two transcripts for both groups in the final sessions are provided so as to present a lucid picture of how metacognitive strategies developed in both groups. In each transcript the group leader is distinguished as S1 and the experimenter as T.

Transcript For ET/RT Group: Day 3.

Text: What's Up Pussycat?   Source: Countdown Magazine

Did you think that the leopard and the panther were two different members of the cat family? I did! But in fact, the panther is really just a leopard with a black coat. Normally, leopards are yellowish with black spots. The leopard is a very good climber and spends a lot of time lying in the branches of trees waiting for its prey to pass beneath. Then it pounces and kills. After feeding for a while it sometimes drags the body of its victim up on to a bough of a tree and leaves it there for the next meal or two. Leopards eat antelope, sheep, goats and hens and are especially fond of dogs! (Revenge of the Pussycats!)

Reciprocal Dialogue:

PAUSE.

1. T: Do you want to give a summary of the first paragraph, S1?

2. S1: Yeah, Leopards spend most of their time in a tree.

3. T: A very good effort. Anyone like to add to the summary - something that he may have left out that might be a main idea, that's important.

4. S2: The leopard and the panther are in the cat family, except they're both different colours.

PAUSE.

5. T: That's a fantastic summary. So the leopard and the panther were two different members of the cat family. Did you notice that I read the first sentence of the paragraph. Often the main ideas are in the first or the last sentence of the paragraph.

PAUSE

6. T: Does anyone want to ask questions in this group?

7. S2: (Puts hand up).

8. T: Okay, you ask your question to the group.

9. S2: Why do leopards stay up trees?

10. S3: 'Cos they look down for food. They try to spy for food . So no-one can like

   eat them this way.

PAUSE.

11. T: Any one else like to ask a question?

PAUSE.

12. S4: How do leopards climb up the trees?

13. S1: 'Cos they've got claws, sharp claws and they stick them in the tree and they

   climb up.

14. S4: They've got a good grip in their claws, and they just jump.

PAUSE.

15. T: Right. I would like to ask a question. When the leopard has killed an animal

   what does it then do with the carcass, the dead animal?

SILENCE.

16. T: It just doesn't leave it there and fetches a napkin and some salt and pepper,

   does it?

17. S5: (laughs). No, it drags it.

18. T: Where does the leopard drag the animal?

19. S5: Up the trees.

20. T: So what does that say about the leopard? It drags the large carcass up a tree.

   The dead animal is often the same size as the snow leopard.

21. S4: It is going to eat it.

22. S2: Its not a weak animal, it's a really strong leopard.

PAUSE.

23. T: Yes, the leopard is very strong isn't it. Do the leopard and the panther eat the

same sort of prey?

24. S1: No, lots of different things.

25. T: Like us. For humans to keep healthy we must eat a variety of foods too. We only find out what the leopard eats - antelope, sheep, goats and hens and even dogs! That's quite a variety!

PAUSE.

26. T: Any clarifications needed?

PAUSE.

27. S1: No.

28. T: I would like to clarify the word 'bough'. So let's find out where the word is, and try to figure out what it means. (Reads from paper). "After feeding for a while it sometimes drags the body of its victim up on to a bough of a tree and leaves it there for the next meal or two."

29. S3: We've done that word with STLD. It means a big branch.

30. T: Fantastic! Yes, it's a large branch.

PAUSE.

31. T: Any predictions about what's going to be written about next?

SILENCE.

32. T: I predict that we are going to look at other members of the cat family next.

SILENCE.

33. T: Okay we're finished now. Good work.

Analysis:

The experimenter needed to prompt S1 to give a summary. The summary indicated a lack of understanding of what a summary entails. Details were mainly given as main ideas - line 2. S2 (line 5) indicated an understanding of what a summary is. The students responded mainly to the experimenter and not to the group leader (line 7), as

they asked a question by raising their hand and trying to attract the attention of the experimenter. Questions asked had little to do with the paragraph that was read (lines 10 and 12), and were difficult to answer if scant knowledge of the cat family was known. To assist the students to develop higher order thinking questions via experimenter modelling took many attempts, with the students manifesting a lack of confidence and difficulty in grasping the style of questioning (lines 15 to 22). Students were not as yet using their question stems to assist them in formulating questions. The experimenter mainly assumed the role of group leader with the experimenter initiating questions and asking for clarifications. The dialogue was punctured by many pauses and students assumed largely a passive role in the earlier stages of the session. The experimenter attempted to use humour, warmth and support in order to encourage students to formulate questions. The experimenter also attempted to make the text more meaningful and to activate prior knowledge by relating the text to human experiences - line 25. The clarification strategy was possibly not understood and students found the meaning of an unknown word 'bough' by recollection rather than using the skills taught in the practice week. Discussion was limited, and coaching, extensive modelling and prompting was largely performed by the experimenter.

<u>Transcript For RT Only Group: Day 4</u>

<u>Text: What's Up Pussycat? Source: Countdown Magazine</u>

The tiger of Asia is the largest - and fiercest - member of the cat family. It always hunts alone, either just before or just after sunset, and feeds mainly on antelope, deer, wild pigs and (sometimes) monkeys. But it will eat almost any meat. And do you realise what that means? Tigers should never be let loose amongst the other animals in the zoo! Tigers like water and, in the tropical heat, swim for hours to keep cool.

Reciprocal Dialogue:

1. T: S1, its your turn for the summary now please. Okay, are you ready?

2. S1: Yeah.

3. S2: Can I ask a question?

4. S3: No.

5. S1: "The tiger of Asia is the largest member of the cat family." (Reads from paper).

6. T: Right so is this summary all about the tiger from Asia? Is it about anything else?

7. S4: And what it eats.

8. S3: It eats er . . .

9. S1: Yeah.

10. S3: Pigs, sheep er . . .

11. T: Please do not all speak at once. If you speak over each other - it's difficult to hear what you're actually saying.

PAUSE.

12. T: So we have established that this paragraph is about the tiger from Asia. (reads from paper): "So the tiger of Asia is the largest - and fiercest - member of the cat family. " Notice that I read the first sentence of the paragraph, which summed up the main ideas.

PAUSE.

13. T: Any questions?

14. S5: Yes. Which of the cat family is fastest?

15. S1: Er . . . the leopard.

16. S4: No, the panther.

17. S1: Why shouldn't the tigers be loose at the er . . . jungle, I mean the zoo?

18. S2: They would kill everyone.

19. S5: They would eat the other animals.

20. S2: And they would sense the smell of other meat and so they would come and kill the other animals.

PAUSE.

21. T: I would like to ask a question. It's from the laminated card. Why is water important to the tiger from Asia?

22. S5: 'Cos they need it to drink.

23. S3: Cos it's hot and they need to cool down, so they swim.

24. T: Wonderful answers. Yes, they live in a tropical climate which means it's very hot and they need to cool down especially since they have a heavy coat of fur.

PAUSE.

25. T: Any words to clarify? A difficult word to figure out?

PAUSE.

26. S1: No.

PAUSE.

27. T: So there are no words to clarify?

28. S5: Where's the tiger from?

PAUSE.

28. S3: Malaya.

29. S2: Canada.

30. S1: Bingo.

31. T: That was a question. Remember that the tiger we're reading from comes from Asia.

PAUSE.

32. T: That was an interesting discussion. We're finished now.

Analysis:

The experimenter assumed the role of group leader (line 1). The student leader (S1)

however, gave a summary which contained most of the main ideas and less minor detail. The students were not able to identify the key sentence in the paragraph which summed up the gist of the paragraph. The students were aware of the procedure inherent in the reciprocal dialogues (lines 3-5). They were aware that they require an initial overall picture in order to gain a thorough understanding of what they are reading. Questions being asked were often unrelated to text and the experimenter had to remind students to use the prepared question stems and had to model their use. The students then responded enthusiastically, which led to an abolition of the turn-taking procedure. The teacher prompted for use of the clarification strategy and like the ET/RT group, students had not fully comprehended the strategy, and in this case tried to ignore the experimenter's request for clarifications and asked questions instead.

Middle Session Transcripts. ET/RT: Day 9.

Text: Food, Glorious Food! Source: Countdown Magazine

Bats have starred in books, movies, even in nightmares! Just think of all those horror movie scenes: bats flapping around haunted castles, bats sinking their fangs into the nearest neck, bats turning into human vampires at every sunset.... Well, this may be all great entertainment, but it's very far from the truth! No self-respecting bat would want to change into a human, even if it could. And as any bat would tell you, there are much easier ways of getting food than attacking a person's neck! To set the record straight, there are a few important bat facts.

Reciprocal Dialogue:

1. S1: We have to predict.

2. T: Yes, you guess what the story might be about from reading the title.

3. S3: It's about bats.

PAUSE.

4. T: Very good. Does anybody want to add to the prediction? Danny thinks it's about bats.

5. S3: What they eat.

6. T: What who eats?

7. S3: The bats.

8. T: Do we know that is about what bats eat from the title: "Food, glorious food?"

9. S4: It's about food, yeah food.

10 S5: What does glorious mean?

PAUSE.

11. T: So we need a clarification on the word glorious. This is a bit different in this instance as we haven't got surrounding sentences which we can read in order to help us work out the word 'glorious'.

12. S1: I know, it means alot of food.

13. S3: No it isn't. It means really good. Yeah, we use that word when we are at scripture.

14. T: Well done. So whatever we are going to read about it loves food.

15. S4: It's about bats, 'cos we can see the picture and it's a bat hanging from a tree.

16. T: Very good. You used the picture to help you work out what we will be reading about. So you can use the picture, if there is one, to help you predict from the title or to predict what will be discussed in the next paragraph.

17. S2: It's about birds, er...

18. T: Mmmmm. What was that?

19. S2: It's about birds and umm.....bats.

20. T: A good attempt. Why do you think birds are going to be written about as we begin to read the story?

21. S2: I don't know.

PAUSE.

22. T: Birds and bats look alike especially in the dark.

23. S2: Yeah, that's it. They fly and have wings and stuff.

24. T: So as we read the article we will find out if birds are going to be discussed

     alongside bats.

25. S2: Yeah, and maybe if they have things in common.

26. S4: Or maybe we are just going to talk about bats.

READ TEXT IN SILENCE.

PAUSE.

27. T: Danny do you want to give a summary?

EXTENDED PAUSE.

28. T: Remember that a summary tells you what a story or in this case a paragraph is

     about - the main ideas - in one or two sentences.

29. S3: Where do I start? Do I have to read it all out?

30. T: No, Danny. You need to figure out which idea or ideas are the most

     important and you put these ideas in one or two sentences.

S1 FUMBLES WITH PAPER, BREAKING EYE CONTACT WITH THE

TEACHER AND GROUP.

31. T: Would somebody like to help Danny make a summary?

32. S1: I can't find a summary from the sentences. I have to make one up don't I?

33. T: Yes, that's a good observation.

34. S4: I know, I know! You follow those rules on the board. (Recites from the

     board). We make a list -

35. S5: From the main ideas.

36. S2: And then we make a title. Er.....it's about...mmm bats and birds.

37. T: It didn't take you long to make your list of the main ideas! Perhaps if we

     look a little closer....

38. S3: Yep, er....well there are bats and we are talking about movies, oh and yeah

and vampires.

39. S5: We have to put that into a sentence. Like er ... Bats star in movies and are vampires - they drink blood.

40. T: Do you think that this paragraph is telling you that bats are movie stars or that this is not a true picture of the bat?

41. S2: Yeah, miss is right. It says we are going to (reads from paper):"set the record straight, here are a few important bat facts."

42. T: Well done. If we look at the last line of the paragraph it tells us that we are going to read about what bats really do, what they look liked how they live - bat facts.

PAUSE.

43. T: Okay. That was an excellent attempt. Does anybody want to ask a question?

44. S6: Yes, I've got one. Do they hang upside down?

45. S3: Yes.

46. S2: What kinds of foods does it eat?

47. S1: Er.....well...grapes, wild berries and all sorts, like sliced apples.

48. S4: Where does he get the fruit?

49. S3: From trees. Some people feed them from the backyard.

50. T: We need to ask questions that are to do with the paragraph that we have just read. We don't really have specific information as yet which can help us answer questions like what the bat eats.

PAUSE.

51. T: Can a bat change into a human?

52. S6: No, they can't, even if they wanted to.

PAUSE.

53. S4: Can I use a "what would happen if...." question here?

54. T: Fantastic! You don't need to ask my permission, just ask the question to your group.

55. S3: What would happen if it didn't have any wings?

56. S3: Then it wouldn't be able to fly.

57. S6: How can it see in the dark?

58. S1: Its got special eyes.

PAUSE.

59. T: Any clarifications needed? Remember we can figure out a difficult word by reading the surrounding sentences.

PAUSE.

60. T: I need a clarification on the word 'entertainment'.

61. S1: I don't know.

PAUSE.

62. T: Remember to read the sentence in which the word is in.

63. S4: It means something is funny.

64. S3: Yeah, good to watch.

65. T: A good clarification. Thank you.

66. S3: (Giggles). You're welcome!

Analysis:

The team leader has taken more responsibility and is aware that a prediction using the title is a strategy used in reciprocal teaching (line 1). Several students attempted a summary. S5 asked for a clarification of the work 'glorious' which required teacher reexplanation of the strategy (lines 10-11). Students participated in a slight discussion and a clarification was made (lines 12-14). S1 was unconfident when attempting a summary but remembered that if a summary could not be located in the first or last line of a paragraph then one needed to be made up. S5 was aware of the steps in order to do this, and used the board for reference. Students helped each other and a definite dialogue was observed (lines 29 to 39). The experimenter needed to prompt for question time, with students responding enthusiastically. Many questions were not

based on the paragraph and were on the whole obscure. S4 used the laminated card, the first group to do so, and asked a what would happen if . . . question (line 53). The students responded to this question stem well. The experimenter prompted for clarifications. A clarification was asked for by the experimenter with students needing reminding of what the strategy involved. A lot of dialogue was evidenced in this session with students asking a lot more questions and offering a variety of predictions. Discussion was perhaps inhibited by the use of expository passages which may not lend themselves as easily to dialogue as they often contain predominantly factual information.

Transcript For RT Only Group: Day 11.

Text: When It's Polite To Spit. Source: Countdown Magazine

We all know that it's bad manners to spit in public. In fact, some of us have been told not to do it at all if we can help it. But it's not the same everywhere. Did you know that spitting is a very important part of daily life for some animals? For them, spitting is just the right thing when they want to defend themselves, to eat, or to find a mate.

Reciprocal Dialogue:

1. S1: I'll do a prediction er... I mean summary. It's bad manners for the animals to spit, but it's the main thing for animals.

2. S2: Me, I'd also like to make a summary. It's saying about animals (giggles) spitting. It's rude, but only for humans. It's okay for animals.

3. T: So animals are really not aware if it's rude or not to spit. Spitting really only matters to people.

4. ALL: Yeah.

5. S1: Hey does anyone want to clarify a word, or any questions?

6. S3: No.

7. S4: No.

8. S1: Does anyone want to predict?

9. S2: Yeah. Maybe in the future animals might not spit and do different things like (giggles) like ....

PAUSE.

10. S3: Why is it rude for people to spit?

11. S1: 'Cos its bad manners. If you spit in public it's bad manners.

12. S1: Does anyone want to predict or clarify anything?

13. S5: I want to predict.

14. S1: Okay.

15. S5: Maybe it'll be rude for the animals to spit like it is for us.

PAUSE.

16. T: Michael wanted a clarification on the word manners. What if you read the sentence in which the word appears, to help us figure out the meaning.

17. S1: That means it's rude, it's er... bad, it's not good in public.

18. S4: It's not allowed in N.S.W.

19. T: So manners mean when you behave politely. I have a question. Why is it important for animals to spit?

PAUSE.

20. S1: 'Cos they like it.

21. T: If you read the last line of the paragraph it will give you some information on why it's important for animals to spit.

22. S2: Er ... I've found it. (Reads from paper): "For them, spitting is just the right thing when they want to defend themselves, to eat, or to find a mate."

23. T: Very good.

24. S5: I've got a question miss.

25. T: Well ask the question to your group.

26. S5: Why is it rude for people to spit and not for animals?

27. T: A very interesting question.

PAUSE.

28. T: So why is it seen as rude when people spit and okay when animals spit?

29. S1: 'Cos animals need to spit, and we just like it.

30. T: So you're saying that animals need to spit for good reasons like defending themselves and people don't have good reasons.

31. S1: Yeah, that's it. And it looks gross too!

PAUSE.

32. T: Anybody need to clarify other words in the paragraph?

33. S4: Yeah, I thing we'll talk about camels next.

34. T: Remember that clarify means to figure out what a difficult word means and predict means to guess what we're going to read about next having just read the title of paragraph.

PAUSE.

35. T: Well, I would like to clarify the word 'defend'.

36. S1: It means to look after yourself, kind of like not letting anyone attack you.

37. T: Thank you for that clarification, I understand the sentence alot better now.

38. S6: I want to know what the word 'public' means.

39. S1: Well . . . er . . . I don't know.

PAUSE.

40. T: Can the group read the sentence with the word 'public' in and help your group leader figure out what the word might mean.

PAUSE.

41. S3: It means kind of like . . . outside.

42. S5: Yeah, where everyone can see you.

43. S1: Yeah, it means outside.

44. T: Well done. What an excellent group effort.

45. S1: Any other words to er . . clar . . .clarify?

PAUSE.

46. S1: Any predictions?

47. S4: Yeah, me. We're going to read about different animals that spit.

48. S3: And people that spit.

49. S2: Where the spit goes (giggles).

PAUSE.

50. T: Well done everyone, a good effort.

Analysis:

S1 assumed a leadership role immediately and began with a summary (line 1). S1 appeared to get summaries and predictions mixed up. S2 also wanted to make a summary, which had not been requested before in the sessions. Both summaries were similar with main ideas inherent in both. Students were participating more actively in the reciprocal sessions. S1 appeared more concerned with maintaining momentum and getting through the four strategies than letting discussions take place (lines 5 to 9). In this haste predictions were asked for after clarifications and summaries when it would have been a good idea to have the prediction at the beginning of the paragraph/title or the end of the paragraph. S1 played a rather dominant role which may have adversely affected other less dominant students in that they felt inhibited in participating in the dialogue and hence alternative viewpoints may have been lost. This sessions marks a move away from the experimenter owning the learning and a move towards the students responding to the group leader and to themselves (lines 5-9). The experimenter still needed to reexplain strategies and provide feedback. Students asked questions without prompting from the group leader and experimenter (line 24), although the students looked to the experimenter when asking if they could put a question to the group which suggests that self-regulation is developing but students have still not fully owned their own learning. The clarification strategy needed to be

expounded again, but once explained the students used this strategy (lines 16 to 22 and lines 34 to 45). Not many questions were asked, but when asked where based on the text and several students involved themselves in answering the questions. Question stems from the card were not used. The group leader assumed responsibility again by asking for clarifications and predictions. Some students were off-task and gave predictions which were meant to distract - line 49 (S2). The interaction between S1 and S2 was one of competing for the group's attention and vying for the role as coach/ group leader. This may have had an effect as suggested previously on the reciprocal teaching session.

Transcript For ET/RT Group: Day 15

Text: Wolves   Source: Countdown Magazine

Wolves often travel for many days before they find food. They jog along a trail at a good pace - about eight kilometres an hour. Usually, they find their food by its smell, which it carried by the wind. When they get a whiff, the wolves crowd around the leader and point their noses in the direction of the prey. Then they follow the leader towards it. Now, they have to be careful of the wind. If it blows behind them and towards the prey, the prey will smell their scent and get away. Caribou, elk and deer run very fast, and easily scamper over logs and rocks.

Reciprocal Dialogue:

1. S1: I would like to make a summary. It's the second one (reads the line). "They jog along a trail at a good pace - about eight kilometres an hour."

2. S2: Yeah, good. I would like to make a summary too. Wolves travel very often, lots of kilometres and ... and .... usually they find their prey along the way. And some times they get into fights with humans.

3. S3: I would like to make a summary (reads from paper) - "Caribou, elk and deer run very fast, and easily scamper over logs and rocks."

4. S4: If the wind blows the other way, behind them, the prey will smell them and then run.

5. S1: This is good. Any questions?

6. S3: Am I allowed to make a question?

7. S1: Yes, yes you are

8. T: Before we ask any questions it would be a good strategy to organise our main ideas and make sure we all agree on a summary. Okay the main ideas we have suggested are 1. The wolf jogs at a good pace. 2. They find their prey while they are jogging. 3. Their prey are usually elk, caribou and deer which run very fast. How do we put this into a summary. Remember we don't want detail but just the most important ideas.

9. S1: Wolves jog alot, and they do this to find food.

10. T: Good. So we are saying in our summary that "Wolves often travel for many days before they find food." Notice that I have read the first sentence of the paragraph, which in this case gives us all the main ideas that we need to sum up what we've just read.

PAUSE.

11. T: Okay, anybody like to ask some questions now?

12. S3: When er... do they mostly travel to?

13. S5: The south.

14. S6: The East.

15. S1: The north.

16. S2: Yeah, the north.

17. S1: Then the south.

18. S3: Where does the wind blow?

19. S1: It blows at the harbour.

PAUSE.

20. S5: We give up.

21. S4: Where does it blow?

22. S3: It gets away.

23. T: It is a good idea to ask questions which have to do with the paragraph. Wind is important for the wolves. Why is the wind so important?

PAUSE.

24. S1: So they can smell their prey.

25. T: Excellent. So they know where the animal is and they can go and seek it out.

26. S5: They can also run very fast.

27. S2: I want to make a question, a question.

28. S1: Yeah.

29. S2: What runs very fast over the logs and the rocks?

30. S6: The caribou.

31. S2: And -

32. S3: The elks.

33. S1: Yeah, that's good.

34. S2: Anyone want to predict?

35. S6: Yeah, I want to predict. I'll predict. After this, they might turn into humans.

36. S1: Yeah, that's what I said.

37. T: So you think we're going to move into more make-believe than facts about wolves, do you?

38. S1: Yeah.

39. T: No, I think they'll talk about how they kill their prey.

40. T: So we are predicting two different things, one fiction (facts) and one non-fiction (make-believe). It will be interesting to see which prediction comes through. Thank you for all your time and effort, we've finished now.

<u>Analysis:</u>

S1 gave a summary which largely contained detail and an absence of main ideas. This was not picked up on and S2 also gave a summary. This was followed by S3 and S4 who also used minor ideas for their summaries (lines 1 to 4). The experimenter needed to intervene to get the group to give a clear summary containing the main ideas (lines 8 and 10). Rosenshine and Meister (1994) argue than summaries require a great deal of comprehension and in this line Pogrow (1990) suggests that it could take several months in order to fully comprehend the summarisation strategy. It is interesting to note that S1 and S2 gave positive feedback to other students summaries (lines 2 - 5). S1 then went on to prompt for questions. This suggests that students are beginning to work cooperatively and assist each other in the learning process. The experimenter needed to model appropriate questions which were not too obscure and hence the students could attempt to answer them (line 23). S2 asked S1 if he could put a question to the group, so the role of the team leader is becoming more apparent and the experimenter prompting only when necessary (line 27). The prediction when made was not based on the paragraph, and this was brought to the students attention by the expert experimenter (lines 37 to 40).

<u>Transcript 2 For ET/RT Group. Day 15</u>

<u>Text: Wolves   Source: Countdown Magazine</u>

When the pack find their prey they begin to stalk it. Moving silently, they follow it without being seen. Suddenly, the animal will turn and see the wolves. If it runs, the wolves will rush it, taking great bounding leaps toward it. When they make a kill, the wolves tear off great hunks of flesh at a time. At one feeding they can eat up to nine kilograms each - enough meat to feed forty people! Later, the pack travels to an open, comfortable space and lies down. They have a nice rest while digesting their food. If

it's cold or wet they curl up under a tree and doze.

Reciprocal Dialogue:

1. S1: Okay, I'd like to make a summary for the third paragraph.

2. S2: Me, I'd like to make a summary.

3. S1: They say - moving lightly follow their prey.

4. S3: Yeah, that's good.

5. S1: And they tear off big hunks of flesh.

6. S2: Good.

7. S4: If it's cold or wet they curl under a tree and hide.

8. S1: Yeah, that's a good summary.

9. S3: They tear of big hunks of flesh.

10. S1: Yeah. Michael.

11. S2: What?

12. S1: Would you like to make a summary or anything?

13. S2: No.

14. S1: Okay, a question, prediction, clarify?

15. T: Before we go on, it would be good if we could bring all the ideas together, sort out which are the most important and then make a summary for the third paragraph. Okay, so we said that a. The wolves follow their prey, b. They tear the meat whilst eating c. When it's wet they take cover by hiding under a tree. So we need to put the most important ideas in a summary, remember the summary must retell the paragraph.

16. S1: It's about wolves getting their prey.

17. T: Fantastic! So we could in fact use the first sentence of this paragraph to give a summary. (Reads from paper): "When the pack find their prey they begin to stalk it."

18. S1: Yeah.

19. S5: I would like to make a question.

20. S1: Okay.

21. S5: No, I would like to clarify. What is this word (laughs). I can't say it properly.

22. T: It's doze.

23. S5: Oh.

24. S1: Do you know what that means? It means that they're sleepy.

25. S1: I would like to make another summary (reads from paper): "If it runs, the wolves will rush it, taking great bounding leaps toward it."

26. S2: I would also like to make another summary. They are saying how they hunt their prey, with their sharp teeth they rip their flesh. That's what they mainly eat, meat.

27. S1: Okay, Nawel. But we've done the summary. What was it again miss?

28. T: You tell me S1!

29. S1: Oh, I remember now, it's the first sentence. (Reads from paper): "When the pack find their prey they begin to stalk it."

30. T: Good summary.

31. S3: I would like to make a question.

32. S1: Yes.

33. S2: When they walk, why do they hide?

34. S1: Er.... they walk so they can't be seen. That's a good question.

35. S5: What do they follow?

36. S1: Er... people, or prey - or something.

37. S1: Anymore questions. Right make some questions. You're moving too slowly. Okay, Jonathon.

38. S6: How long can they go without food?

39. S1: A day.

40. S6: No, a week.

41. S1: Would anyone like to make a summary?

42. S2: Yeah.

43. S1: Okay, Michael.

44. S2: It's about ripping animals flesh. Also they have very good hearing.

45. S1: Good.

46. S2: So when they fall asleep they can hear anything that comes. A cub or something.

47. S1: True, that's good Michael.

48. T: Remember that we've done the summary. What you are saying as a summary is detail. The main idea is that they wolf stalks its prey, that's how it hunts. How it eats its prey after it kills it, is really detail isn't it?

49. S2: I guess so.

50. S5: Er....What do they digest?

51. S1: They digest er.... bones, flesh and that.

52. S6: No, only bones.

53. S4: What do they take, what do they take?

54. S1: What do the take? Er.... I don't know.

55. S1: I would like to predict. Maybe ....er.... when they go on with the story, the wolves eat something else. They might eat snakes. Something else. Different food.

56. S2: Or they might lose that fur and go to hotter places.

57. S5: Like Africa.

58. S4: They might get faster and faster.

59. S2: Or more wilder

60. T: That was a good effort. Lots of interesting questions were asked and everyone put a lot of effort into making the summary. Well done.

<u>Analysis:</u>

The students spontaneously and enthusiastically attempted summaries - predominantly containing minor ideas and detail. Then S1 wanted to move onto the other strategies, without attaining a clear and concise summary (lines 1 to 14). The experimenter took the students through the process of giving a summary (line 15). Once again, summaries were difficult to construct. S1 assumed the group leader role again, and students asked S1 if they could ask a question to the group. The student leader is assuming the role of an autonomous learner in that he is becoming responsible for his own learning and is a willing participant in the process. On line 19 the student recognised the difference between asking a question and wanting to clarify a word. The word was successfully clarified by the group, following reading of the sentence in which the word was found. On lines 25 and 26 students gave summaries once again. S1 reminded them on line 27 that an adequate summary had been given. S1 assumes the role of group leader very effectively and the students respond to him in the appropriate manner. On line 35, S1 responds positively by praising the student for giving an answer to a question. However on line 37, S1 admonished the group for not asking enough questions! In an effort to control the group and move through the four strategies, S1 asked the group for another summary. (Perhaps he was thinking of predictions). The experimenter reminds S1 that a summary has been given (line 48). S1 hastily moves onto the prediction strategy, giving a prediction himself (line 55).

<u>RT Only Transcript For Day 19</u>:

<u>Text:Wolves   Source: Countdown Magazine</u>

There are two kinds of wolves - the tundra wolf and the timber wolf (also known as the grey wolf). The tundra wolf lives on vast treeless plains called tundras. This kind of country is far north in Alaska, northern Canada and the Arctic. They hunt mainly

herds of caribou. The timber wolf lives farther south in forests and mountains and woodlands. Big animals like deer, moose, elk, sheep and buffalo are their favourite foods.

Reciprocal Dialogue:

1. S1: The..the.... the... wolves live (reads): "The timber wolf lives farther south in forests and mountains and woodlands. Big animals like deer, moose, elk, sheep and buffalo are their favourite foods."

PAUSE.

2. T: Right, you think that this summary includes the main points then? Remember that the summary needs to include the main ideas and not detail.

SILENCE.

3. S2: No, not really. There are two kinds of wolves, the timber wolf and the grey wolf. And the tundra wolf lives in vast, treeless plains.

4. S3: Reading from paper: "The timber wolf lives farther south in forests and mountains and woodland."

5. S4: They hunt mainly birds.

6. T: We have said that there are two kinds of wolves, the timber and the tundra wolf. We have also said that they live in different areas. It has also been mentioned that they hunt birds. Does everyone agree with these ideas?

PAUSE.

7. S4: No, they don't hunt birds, but the rest is okay.

8. T: So perhaps what they hunt is extra detail then?

9. S4: Yeah.

10. T: Who can give us a summary then with the ideas we have just mentioned?

11. S6: I can. (Reads from paper): "There are two kind of wolves - the tundra wolf and the timber wolf (also known as the grey wolf)."

12. T: Excellent. I also noticed that you read the first sentence out. So you must

have remembered that you can sometimes use the first or last sentence of a

paragraph to give a summary. Well done for remembering.

PAUSE.

13. T: Are there any questions anyone would like to ask the group?

PAUSE.

14. S1: I would, miss. Why does the tundra wolf live on tundras?

15. S4: 'Cos they do, it's where they live.

16. T: So they live in Alaska and the Arctic where there are not many trees, because

of the cold weather.

17. S4: Yeah, that's it.

PAUSE.

18. T: Any other questions?

19. ALL: No.

20. T: Well, I would like to ask a question. What is the timber wolf's favourite

food?

PAUSE.

21. S5: It's buffalo.

22. T: Good. They eat alot of different food don't they? Like deer, moose, elk,

sheep and buffalo. Does the tundra wolf eat the same sorts of food?

23. S3: Yes.

24. T: Do they really. Have a closer look at the paragraph.

25. S4: Oh, they eat car - car - whatever you call it.'

26. T: Good. They eat caribou. What is a caribou?

SILENCE.

27. T: I would like a clarification of the word caribou. Its a difficult word and I

need to figure it out. Let's read the sentence in which it is in : (reads from

paper): "They hunt mainly herds of caribou."

28. S1: It's some sort of rabbit.

29. T: It is some sort of animal. Maybe the word 'herd' gives you a clue to what it
is.

30. S6: A big sort of animal.

31. T: Good like a deer. Any other clarifications needed?

PAUSE.

32. ALL: No

33. T: Would anyone like to make a prediction - about what is going to be written
about next, based on what we've just read.

34. ALL: No.

35. T: Well I would like to make a prediction. I think we are going to read about
what both these wolves live like in their separate areas.

36. T: We've finished now. Don't be afraid of saying what you are thinking.
Anything you say is okay. We are all learning together here. Okay.

Analysis:

S1's summary contained detail rather than the main points of the paragraph. S1 read
the last line of the paragraph rather than attempting to get the gist of the story and then
retell this in one or two sentences. S2 disagreed with S1's summary and gave a
different version which included the main points (line 3). Students offered detail rather
than main points on lines 4 and 5. The student on line 7 disagreed with the summary
versions on lines 4 and 5, and identified their summaries as containing detail rather
than main ideas. Discussions and debates are becoming more evident as the sessions
are progressing. Summaries are still requiring extensive explanations and prompting
by the experimenter as with the ET/RT group. The experimenter prompted for
questions (line 13). The experimenter prompted for more questions (line 18). When
no more questions were forthcoming, the experimenter modelled more questions (lines
20 and 22). The experimenter prompts for clarifications (line 27) and guides the
students through the clarification strategy (line 29). The experimenter prompts for

predictions and models the use of the prediction strategy (line 34). Most of the reciprocal teaching session was initiated and maintained via the experimenter, with students becoming reluctant to respond as the time went on. The ET/RT group in contrast, assumed more active roles in the dialogue and required fewer prompts with the students often prompting each other and attempting to provide explanations of the summary and clarification strategy.

Second Example Of RT Only Transcript: Day 19:

Text: Wolves   Source: Countdown Magazine

Wolves often travel for many days before they find food. They jog along a trail at a good pace - about eight kilometres an hour. Usually, they find their by it's smell, which it carried by the wind. When they get a whiff, the wolves crowd around the leader and point their noses in the direction of the prey. Then they follow the leader towards it. Now, they have to be careful of the wind. If it blows behind them and towards the prey, the prey will smell their scent and get away. Caribou, elk and deer run very fast, and easily scamper over logs and rocks.

Reciprocal Dialogue:

1. S1: They jog along a trail, at a good pace, about eight km.

2. T: Who are they?

3. S1: They.

4. T: Who are they?

5. S1: Ummm... They.

6. S2: (Reads from paper): "Wolves often travel for many days before they find food".

7. T: What are we talking about?

8. S3: Oh, animals. Er.... wolves.

9. T: Anybody add to the summary?

10. S4: Wolves jog around -

11. S3: No. It's the first one (reads from the paper): "Wolves often travel for many

    days before they find food."

12. T: Yes, all the rest is detail and not main points.

SILENCE.

13. T: Any questions?

SILENCE.

14. T: Pita, would you like to ask one?

15. S6: How....how.... do they be careful in the wind? How are they careful in the

    wind?

16. T: An interesting question.

17. S5: They have to be careful in the wind 'cos when the wind blows their prey will

    smell them and know that they're there. Then they'll run off.

18. S6: In the wind, there's lots of dust in the wind. If they're like somewhere

    around dust or loose grass that goes, they might get killed or something.

19. S5: How fast can they travel?

20. T: A good question.

SILENCE.

21. T: Mladen, do you think you could answer the question? The answer is actually

    in the paragraph we've just read.

22. S4: Umm.... Er.... eight something, eight kilometres and hour.

23. T: Very good.

SILENCE.

24. T: Any other questions?

PAUSE.

25. T: I have a question. Do wolves hunt alone, by themselves?

26. S3: Yes, they do.

27. S1: No they follow the leader.

28. T: Very good. When the wolves smell the prey in the wind, they crowd around the leader and follow the lead wolf.

PAUSE.

29. T: Can the wolf trust the wind to find the prey?

30. S6: No, 'cos it can blow north or south or something.

31. T: Good observation. If the wind blows behind them and towards the prey, the prey will smell the wolves and run away.

SILENCE.

32. T: Right, any clarifications?

SILENCE.

33. S6: What does carr - ibou mean?

SILENCE.

35. T: Have a look at he sentence in which the word appears. (Reads from the paper): "Caribou, elk and deer run very fast, and easily scamper over logs and rocks."

36. S3: It's a deer sort of animal.

37. T: Very good. You could figure this difficult word by reading the sentence in which it is in.

38. S1: What does pace mean?

SILENCE.

39. T: Read the sentence in which it is in.

40. S1: (Reads from paper): "They jog along a trail at a good pace - about eight kilometres an hour."

PAUSE.

41. T: Right the sentence in which it appears can help us.

42. S4: Somewhere they can sleep.

43. T: A good try. But that word is place - place.

44. S5: It means that they can run.

45. T: At their own level, comfortably.

46. S5: Yeah, like they can kill an animal as they're running.

47. T: So it means they can run at their own capacity. Not too fast, not too slow, just right for them.

48. S5: What does scamper mean at the bottom?

PAUSE.

49. T: Right, well read the sentence in which it is in and try to figure it out.

50. S1: Where are we, miss?

51. S5: They jump over things - quickly.

52. T: Very good. You figured out the meaning by reading the sentence in which it was in.

53. T: An excellent discussion. Good work.

Analysis:

S1 gives a summary without prompting, reading from the paragraph (line 1). When asked about the summary the student showed little understanding of the summary (lines 1 to 5). Without prompting S2 gave a summary which contained the main ideas (line 6). This version of the summary was supported by S3 (line 11) - support for other students was becoming increasingly evident as the sessions have progressed. Students in the RT group engaged in more discussion than the ET/RT group as a whole. Students were much more able to access the summarisation strategy through group dialogue compared to the ET/RT group where far less discussion on the most appropriate summary took place. Students were reluctant to ask questions and the experimenter modelled and called on students to ask questions - lines 13 to 31. The ET/RT group tended to use their question stems more often and required less prompting in order to formulate questions and put them to the group. The experimenter

prompted for the use of the clarification strategy and then proceeded to model the strategy - line 35. The students then attempted to use the clarification strategy with guidance from the experimenter. Students in the ET/RT group appeared to grasp this strategy towards the end of the reciprocal sessions. Less group feedback was evidenced in the RT only group.

The development of reading comprehension skills were evidenced when students were able to generate summaries, ask questions using the cue card, give clarifications and predict before reading the text. In the initial reciprocal dialogue sessions students in the ET/RT and RT only groups required extensive scaffolding and prompting by the experimenter, but towards the final sessions both groups, particularly the ET/RT groups, were acting more cohesively. The ET/RT groups tended to assist each other more, observe turn-taking procedures, ask for clarifications and predictions without prompting and participated more spontaneously than the RT only groups in discussions. Both groups found the formulating of summaries difficult in the early sessions, and only a few students mainly in the RT only groups, had mastered this strategy by the final sessions. Question formulations had increased in both groups without experimenter prompting. The ET/RT groups tended to use the question stems on the cue card, whereas the RT only groups relied on the simplistic 'who', 'what' ,'where', and 'when' questions.

Quantitative analysis of the data revealed that both the ET/RT and RT only groups had improved substantially from pre- to posttest on the PEP standardised reading assessment. Qualitative analysis of the transcripts indicates that both groups had improved in applying the four reading comprehension strategies from the early to final stages of the intervention. The PEP posttest results also indicate that the ET/RT group improved at a greater rate than the RT only group. An investigation of the reciprocal dialogue transcripts manifests a differential rate of development of reading

comprehension fostering and monitoring skills in both the ET/RT and RT only groups, which may have contributed to the posttest PEP differences in the ET/RT and RT only groups. On the whole, the ET/RT groups were working more cooperatively and autonomously by the final reciprocal sessions, they required less experimenter scaffolding and prompting than the RT only groups, they were able to use the question stems more frequently than the RT only groups and use of these question stems probed the text leading to a deeper understanding, the ET/RT groups on the whole were able to predict more often and unlike the RT only groups, had mastered the clarification strategy.

CHAPTER SEVEN.

DISCUSSION AND INTERPRETATION OF RESULTS

Reading Comprehension Fostering And Monitoring Outcomes

The initial hypothesis focused on the development of reading comprehension fostering and monitoring outcomes in the at-risk primary grade student. A major prediction in the present study was that the ET/RT group would improve significantly more than the RT only group and both the ET/RT and the RT only groups would improve significantly more than the control. The prediction was supported on PEP posttest results, but not in daily reading comprehension assessments, where ET/RT improved at the same rate and not higher, than RT only. This assertion that explicit teaching prior to reciprocal dialogue enhances reading comprehension metacognitive strategies emerged out of recent research in education which suggests that explicit teaching of strategies before students actually begin reciprocal teaching would enhance students' understanding of the strategies, particularly of how, when and where to apply the learned strategies (Means & Knapp, 1991; Rosenshine & Meister, 1991; 1994). Critical factors in the development of metacognition are outlined by Borkowski et al (1989) as being sufficient information about both general and specific strategy knowledge - about why, when, where and how to use the taught strategies.

It is important to take into consideration however, that a standardised test does not emphasise assessment of the child's development of metacognitive strategies, but rather looks at the 'whole academic picture' of the child in this case, in the reading domain. Thus the PEP standardised reading test tests for development in phonological awareness, vocabulary and lexical understanding as well as semantic knowledge. If assessment had comprised experimenter-made tests and not standardised tests, the

ET/RT conditions may have demonstrated a more precise picture of their development of strategic thinking when approaching tasks that require reading comprehension. While the daily passages perhaps afforded more opportunity for students to apply learned reading comprehension strategies, they were still not however, drawn from tests developed by the experimenter, but from educational texts. Furthermore, ten minutes were given to complete the reading assessment at the end of each reciprocal period which may have as previously mentioned, acted as a deadline, leaving students limited opportunity to exercise and practice learned strategies. Students participating in both the standardised test and daily comprehension passages may have valued finishing the assessment more than in attempting to understand the set task, particularly so in the case of the standardised reading assessment.

Additionally, results from daily reading comprehension assessments and statistical treatment indicated that both the ET/RT and RT only made significant improvements in performances on reading comprehension assessments. Both groups improved at the same rate, which was contrary to prediction as it had been hypothesised that the ET/RT group would improve at a greater rate than the RT only group. Analysis of the daily reading comprehension data revealed that there were no significant differences between the ET/RT and RT only groups: thus is the ET/RT group did not improve at a quicker rate than the RT only group, in contrast to the PEP results. There was a significant difference however over time within the two groups, from weeks one to two, two to three and weeks three to four.

There are several factors which may have contributed to the ET/RT not increasing at a faster rate than the RT only condition.

The graphed data (as presented in Chapter 6, Figure 6.2) may appear to suggest that the ET/RT group improved at a greater rate than the RT only group at the end of

week 1 due to the initial explicit teaching of the four reading comprehension strategies which facilitated the students' development of reading comprehension fostering and monitoring skills. Although the RT only groups also improved their reading comprehension scores, an absence of prior explicit teaching of the four strategies perhaps contributed to their apparently lower rate of improvement as depicted in the graphed data (refer to Chapter 6, Figures 6.2 and 6.3) compared to the ET/RT condition at the end of week one. A pretest before week one (undertaken on day 1) indicated that the initial differences in week one were due to the explicit teaching of the four reading comprehension strategies and not due to differences in ability or prior experiences of reading metacognitive strategies in the mainstream classroom.

As mentioned previously, dramatic increases in reading comprehension scores, on the daily passages for both experimental groups reached a peak in week two. After day fourteen the daily scores remained around the same level for both groups, with the exception of day twenty where a decrease in scores is indicated. Motivational changes may have contributed to the levelling off evidenced in the results after week three. Students in both conditions appeared enthusiastic when initially involved in the reciprocal teaching sessions. As the sessions progressed, some students complained that they 'might as well be in class as they were doing work.' Other students compared the sessions to their regular S.T.L.D. (remedial classes), and asserted that they had an 'easier time of it' in their remedial classes.

While each experimental groups showed most substantial gains during week two, the treatment time may nevertheless not be optimal as the processes contributing may differ for both groups. Specific treatments may be enhanced or developed further. Students in the ET/RT condition may not have been able to progress at a more rapid rate that the RT only condition as indicated in the daily comprehension passages given as a form of assessment as these students are academically at-risk and therefore not

performing at grade level in the mainstream classroom, and so require longer time to comprehend and use these strategies. Students' verbalisations in the ET/RT group and to a lesser extent in the RT only group, concerning the difficulties they encountered in attempting to apply the summarisation and clarification strategies would concur with the suggestion that academically at-risk students require a longer period of time in order fully understand and effectively apply learned strategies to set-tasks. The utilisation of questions which require a greater reflection of the text were often absent from the RT only and to a lesser extent, the ET/RT reciprocal dialogues. Without a more penetrating probing of the text, a deeper understanding cannot be achieved (King, 1994). Studies examining the relationship between content knowledge and the use of general strategies conclude that instructional intervention is of little benefit when students are of low ability in the specific curriculum area (Garner & Alexander, 1990). Garner and Alexander (1990) argue that academically at-risk students who were assessed as lower achievers present with deeply embedded, maladaptive cognitive processes which take much longer than several weeks to change. At-risk students are particularly vulnerable to the development of faulty knowledge bases which tend to contain erroneous viewpoints about their world experiences and this child will actively resist adopting factual information which more accurately reflects the environment they live in (Derry & Murphy, 1986).

The ET/RT group had fewer reciprocal dialogues owing to one week of explicit teaching of strategies which possibly affected their performance on the daily comprehension passages as they had less experience and practice in applying the four learned strategies on designated reading passages. A longer single treatment or a recurring series of sessions may be necessitated in order to assist students' in improving their strategic thinking in the longer term. Perhaps if students reinforced their understanding of strategies through homework, more time on reading passages in class could have been undertaken. Although it is important to take into consideration

that negative motivational changes may occur when the period of training is lengthened. Palinscar and Brown (1982;1985;1989) suggest that the development of reading comprehension fostering and monitoring strategies requires twenty consecutive days of reciprocal teaching. This study found however, that the students in both the ET/RT and RT only conditions required approximately 10 consecutive days of reciprocal teaching in order to show significant improvements in their reading comprehension skills as indicated by daily reading comprehension passages. The present study yielded similar findings to that of Lysynchuk and his colleagues (1990) in that the improvements peaked earlier than Palinscar and Brown's suggested 20 days and Lysynchuk's findings suggested that improvements were most significant at day thirteen. As students in the ET/RT condition did not improve at a greater pace than their RT only counterparts it may be that the strategies are complex to learn and require a greater single time period or possible booster sessions.

Transcripts of the reciprocal dialogue indicated that the summarisation and question formulation strategies were not fully comprehended by all group members in the ET/RT and RT only conditions by the final sessions of the intervention. Students frequently found it difficult to create a summary from a compilation of main text ideas even at the end of the sessions and often ignored the cue card with question stems, particularly so for the RT only groups. Perhaps if strategies were introduced in a specific order with particular focus on the summarisation and question strategies which require additional effort, this would have possibly facilitated the ET/RT group in gaining an even greater understanding and application of the four reading comprehension strategies. The Palinscar and Brown (1985) study arrives at similar conclusions and they suggest that students who are not operating at grade level in the mainstream classroom require the gradual introduction of each strategy with summarisation first. The subsequent strategies are not covered until the students have mastered summarisation first.

Perhaps four strategies were too much to learn in five days, and exploration of fewer strategies may yield more dramatic results for the ET/RT group. Rosenshine and Meister (1991) however in their meta-analysis, found the number of strategies did not affect results of the studies that they statistically examined. It has been suggested that clarification and prediction are not necessary in comprehending a text and the question and summarisation strategies are the crucial strategies when trying to comprehend reading material. In the present study strategies were taught consecutively, with summarisation taking two days. The ET/RT required two days of explicit teaching of the summarisation strategy with students voicing their concerns over their ability to identify and to use the strategy on reading tasks. It may be that students needed more explicit teaching of the strategies which required greater practise and understanding. Recent empirical research has suggested that many strategies require significant effort to learn and hence can be quickly abandoned, especially by students with limited knowledge in the domain under study (Garner & Alexander, 1989). It may be that particular strategies take longer time to learn than others. In the present study students appeared to need to expend greater effort in understanding the summarisation strategy as recorded in the transcripts, (this applied to both groups but more so to the ET/RT group) and then the question strategies (this applied mainly to the RT groups) followed by the clarification strategy (particularly associated with the RT only group). Both groups had relatively few problems in understanding and applying the prediction strategy. As the summarisation and question strategies require greater demands on cognition in order to understand them, the at-risk student may need more practice and more time in order to comprehend what constitutes these strategies, why and how to apply them effectively in multiple situations.

Maintenance Of Strategies In The Mainstream Classroom

The statistical analysis of the data obtained from the maintenance probe (social studies comprehension passage with ten questions) indicated that the ET/RT group maintained their learned strategies at a slightly higher level than did the RT only group. There was thus a significant difference between ET/RT and RT only at the Social Studies maintenance assessment stage (week 10) whereas at week 4 when there was not. Students' motivation to approach and engage in tasks as shown by the behaviour participation scale of effort suggests that students were perceiving themselves as capable of completing set tasks and that they could experience success. This motivation to succeed may have assisted students in employing the learned strategies effectively.

Longer, or more intense, instruction may have produced more dramatic maintenance results in the classroom. The maintenance of strategies may be a function of the efficiency with which the strategies are presented during training. Students who master the strategy during the training are more likely to maintain it than those who do not (Osman & Hannafin, 1992). Borkowski et al (1989) found that long term strategy instruction also led to long term strategy use in the classroom situation. The classroom needed to support students in using reading comprehension metacognitive strategies (Thomas, 1988). They suggest that lack of perceived support is a main factor in students abandoning strategies taught. Learners are more likely to apply learned strategies when they are given detailed, conditional knowledge by their teachers about how and when to use it (Osman & Hannafin, 1992). Garner and Alexander (1989) argue that strategies take time to apply to assigned tasks. This may be increasingly the case if students have not used them or had the opportunity to use them for a sustained period of time. In addition it is hypothesised that quick task completion is often seen as a major hallmark of success in the classroom rather than effective performance which

includes a deeper understanding of the task. A student will not persist in applying learned strategies if those strategies are not valued by the classroom teacher and if the teacher does not provide ample opportunities for students to engage in problem solving activities (Borkowski & Muthukrishna, 1992). The strategy orientated teacher emphasises strategy selection and implementation and not just effort which gives these students a sense of self-control as they simultaneously develop metacognitive processes.

When faced with a time limit as in the case of the social studies maintenance assessment (10 minutes) students may not have been able to identify and pull together the main ideas inherent in the text and may not have self-monitored and reflected on the meaning by rereading the text. The students may have perceived the strategy as not applicable to completion of the set task. Garner and Alexander (1989) suggest that when faced with a standardised test, many academically at-risk students adopt familiar albeit maladaptive strategies.

Reciprocal Dialogue And The Development Of Strategic Thinking In Reading Comprehension

Though both interventions manifested substantial gains, the qualitative data suggested that the quality of strategy use attained indicated that there was scope for much further development. Recorded transcripts were qualitatively analysed in order to explore students' development of reading comprehension fostering and monitoring strategies. It was hypothesised that students in the ET/RT and RT only groups would develop metacognitive processes by participating in reciprocal dialogues in which students attempted to make predictions, provide summaries, ask literal and non-literal questions, and where appropriate, ask for or make clarifications. Furthermore it was hypothesised that the ET/RT group would, by the final sessions, be able to formulate

summaries without experimenter assistance, to formulate 'thinking' questions more often than the RT only group, to ask for and give clarifications without experimenter modelling and prompting and make appropriate predictions at an increased rate compared to the RT only groups. It was postulated that the initial week of explicit teaching of the four reading comprehension strategies experienced by students in the ET/RT condition would assist these students in more effectively implementing the strategies on set-tasks in the reciprocal dialogue sessions.

Students were categorised then as being successful in developing reading comprehension skills in both ET/RT and RT only groups when they were able to effectively apply the four reading comprehension strategies of summarisation, questioning, prediction and clarification to reading tasks in a relatively autonomous manner, that is, with limited experimenter scaffolding and taking substantial responsibility for their learning.

Both ET/RT and the RT only groups appeared to develop reading comprehension fostering and monitoring skills through the intervention. Specifically, qualitative data analyses suggested that in the final sessions the ET/RT group tended to formulate more 'thinking' questions, was able to clarify and predict without experimenter prompting and could provide a summary where context cues were provided in the text. The question stems used in the present study were derived from King's (1994) study which found that 'thinking' questions encourage deeper reflection on the text and lead to a range of explanations which assists students in developing comprehension skills. The present study reached similar findings to those of King in her (1994) study in that the ET/RT group achieved significantly higher scores in the standardised PEP reading test compared to the RT only group and this dramatic increase in scores obtained by the ET/RT group could be partially due to these students using thinking questions in the reciprocal dialogues which promoted a deeper understanding of what they were

reading and which in turn facilitated higher achievement on the standardised reading test. When students had to construct a summary by listing main ideas inherent in the reading passages, however, students in this group found this task difficult to complete.

The RT only group could summarise more effectively, but still required teacher modelling and prompting, and could clarify and predict with teacher prompting. Questions were usually literal questions with little reference to the cue cards being made. Questions being asked were often unrelated to text and the experimenter had to remind students to use the prepared question stems and had to model their use. Both groups participated more actively in the reciprocal sessions towards the end of the reciprocal teaching sessions. As the sessions progressed the students in both groups, but more so in the ET/RT group, participated in the dialogue and began to provide support, prompting and feedback to each other which assisted students in developing reading metacognitive skills and in becoming active learners. In the middle sessions the team leader in the ET/RT group had taken more responsibility. A lot of dialogue was evidenced in this phase with students asking a lot more questions. Discussion was perhaps inhibited by the use of expository passages which may not lend themselves as easily to dialogue as they often contain predominantly factual information which is not often disputed or forms easy ground for discussion with primary students.

The RT only group became progressively involved in the reciprocal teaching sessions and began to provide support and modelling for each other although not to the same extent as the ET/RT group. Modelling of the summarisation strategy was undertaken and this was especially shown when they frequently assisted each other in repairing the incorrectly applied summarisation strategy. The group leaders did not require much prompting to assume their role as leader and these students towards the end of the sessions, like the ET/RT group, almost immediately   began with a summary.

Palinscar and Brown (1985;1989) argue that reciprocal teaching is an effective teaching format when students respond willingly in the role of team leader. This was seen in both groups, but much more in the ET/RT group. Palinscar and Klenk (1991) also suggest that when students willingly assume the group leader role, they are becoming more autonomous learners as they are assuming responsibility for their own learning and thus control over the dialogue flow. Communication skills were still developing with the leader sometimes taking an authoritarian and not an authoritative stance and wanting to 'control' rather than participate in proceedings on occasions. Sometimes leaders appeared more concerned with maintaining momentum and getting through the four strategies than letting discussions take place. Temperaments appeared to contribute to whether students would want to take control when they were in the leadership roles. Turn-taking was also an area that negatively affected the reciprocal dialogue on occasions.

Experimenter scaffolding, support and feedback were still largely relied upon by the RT only group in the middle sessions. Most of the final reciprocal teaching sessions for the RT only group were still being initiated and maintained via the experimenter, with students becoming reluctant to respond as the time went on. Students appeared as if they did not want to ask many questions and the experimenter usually ended up modelling and calling on students to ask questions. Students in the RT group required praise and feedback on how they were performing to a greater extent than the ET/RT group. The development of self-regulated behaviour assists students in assuming behaviours similar to high achievers in that they become enthusiastic and eager to participate in reciprocal discussions, responsive to challenge and are not dependent on their peers or teacher for substantial guidance (Padron, 1991). It can be seen in the results that the ET/RT group tended to apply learned strategies without experimenter prompts and modelling towards the final sessions, with the exception of the summarisation strategy.

As previously mentioned both groups found it difficult to apply the summarisation strategy appropriately, especially when it had to be constructed from a list of main ideas and was not as such easily identifiable from the text. This finding concurs with that of Brady (1990; cited in Rosenshine & Meister, 1994) in that effective use of the summarisation strategy requires intensive practice and occurs gradually. The development of the summarisation strategy may have also been negatively influenced by the students' age. Garner and Alexander (1989) suggest that younger students are less articulate and thus are limited in discussing cognitive events. Students need to externalise their cognitive processes so that students in the group who are not as able may model from their coping models and hence develop metacognition.

At-Risk Students' Motivation Patterns

It was hypothesised that the ET/RT and RT only students would become increasingly motivated to participate in the reciprocal sessions and to apply learned strategies. Hence it was expected that a move away from extrinsic motivation would be evidenced and a move towards introjected and intrinsic motivation would be shown. It was suggested that the control group would not show any marked changes in motivation from pre- to posttest on the motivation questionnaire. Furthermore, it was hypothesised that the ET/RT would show higher motivation levels than the RT only group. It was conjectured that explicit teaching of actual metacognitive and cognitive reading comprehension strategies prior to reciprocal teaching would enhance motivation. Borkowski et al (1989) have suggested that metacognition and motivation are interdependent and if metacognitive knowledge is developed, motivation to apply learned strategies also increases.

The pretest data revealed that the control group scored higher on identified, introjected and intrinsic motivational styles and showed a markedly lower level of extrinsic

motivation compared to the ET/RT and RT only groups. The posttest results indicated that the RT only and the ET/RT adopted motivation patterns which moved away from extrinsic motivation, with the ET/RT assuming marked increases in identified and introjected motivation and the RT evidencing marked increases in all four scales, particularly with regards to intrinsic motivation. The control showed a decrease in all four motivational patterns at the posttest stage. The results essentially showed that the ET/RT and RT only groups caught up with the control group.

Introjected and intrinsic motivation are viewed in the present study as highly desirable states for the academically at-risk student to acquire as both motivational states present very similarly in the classroom setting in that students with these motivational states engage in tasks willingly and with interest. It is suggested that students in the RT only and ET/RT groups who scored highly on introjected and intrinsic motivation were attempting to identify and use learned strategies, correct ineffective strategies and self-set proximal goals. Students in these groups that scored highly on these two scales may have also increased perceived competence due to the reciprocal teaching (Deci, 1991). Reciprocal teaching provided feelings of competency through feedback on task related performances in the form of constructive feedback from the experimenter and to a lesser extent peers, and through graphed feedback.

What factors could have contributed to the control group's unexpectedly higher levels in identified, introjected and intrinsic motivation and markedly lower levels of extrinsic motivation as evidenced in the pretest motivation questionnaire? Student and teacher reactivity to the intervention may be a major contributing factor in the control group's unusually high pretest scores on all 4 motivation scales. Students were aware that they would be participating in a university study prior to the commencement of the study as the principal of both schools wanted teachers and parents inserviced on the procedural aspects of the intervention and the desired outcomes. Most of the students placed in the

control had permission from parents to attend the pre- and posttest measures and to participate in the intervention. Three parents however, did not want their children involved in the intervention, but favoured the pre- and posttesting. These students were placed in the control conditions. Parents of these students could have communicated to their children that the pre- and posttest measures were of positive value and the intervention was conversely not of educational value. These students may have then scored lower on the extrinsic scale in the initial pretest motivation measure and higher on the other more integrated motivational states as they viewed the pretest measures of some significance. Perhaps assessment of self-efficacy in reading comprehension could be included as an outcome variable in subsequent studies.

Although students were not told by the experimenter about the group they were placed in, this information was given to classroom teachers just prior to the commencement of the intervention at the request of the teachers and principal so that timetabling issues could be considered. It may be that some teachers related to students what group they were going to be in and from their perspective, what that condition entailed. The experimenter had encountered largely negative reactions from teachers concerning the intervention from both schools. A staff meeting was held prior to the intervention in both schools to explain what the study entailed, also at the request of the principal. At this meeting teachers whose students may have been involved in the study (i.e. third and fourth grade teachers) perceived the intervention as a vehicle which would criticise in some manner their teaching skills and to that end the experimenter was asked not to come into classrooms. Further it seemed that reciprocal teaching was viewed by teachers negatively as a viable teaching technique.

Some teachers may have imparted negative views on the intervention to students in their class whom they knew to be involved in the actual intervention and hence the ET/RT and RT only students who may have obtained lower motivational pretest scores

and this negative expectation about the intervention could have contributed to the markedly lower ET/RT and RT only scores on the integrated motivational states in the pretest. Conversely, peers may have then suggested that some students were being left out if they were aware of what condition their fellow peers were placed in prior to the commencement of the intervention. Some teachers and parents for that matter, may have imparted a positive view of the intervention on the other hand, which may have also created the impression that students in the control condition were missing out on something and this may have contributed to their surprisingly higher score on the extrinsic scale. Furthermore, some students also voiced a concern that they were embarking on additional S.T.L.D. sessions, or to be given extra homework. Hence several students had adopted a negative approach to the study which was further influenced by the PEP reading test and motivational questionnaire given at the beginning of the study and this may have contributed to markedly higher extrinsic motivational scores evidenced in the control condition.

Another factor which could have contributed to the control group's higher pretest scores was the actual grade from which they were drawn. As there were insufficient numbers of academically at-risk students in third grade, the study was also opened up to fourth grade. One fourth grade classroom teacher wanted her students to participate in the study after recess as they had sport in the morning. Students from this fourth grade group may have been disappointed that they had missed sport for the pretest motivation questionnaire and this may have contributed to high scores obtained on the extrinsic motivation scale.

Motivation levels may have been affected by the environments the students were in when undertaking the intervention, which could have given the impression that the intervention was not to be taken seriously. Students may have perceived themselves initially as having 'time off' when involved in the reciprocal teaching sessions as the

sessions were held in a Before-And-After-School room in school one and in the library in school two. Both environments may have given the impression that the reciprocal sessions were not to be taken as seriously as they were not conducted in a regular classroom. A classroom was not available in both schools as all rooms were occupied by classes. In addition, students were frequently interrupted in both environments, particularly in the library setting. Although the students were located in an area of the library that was partitioned off by shelves, they were still aware of students coming in to return and borrow books. Some students found this distracting, particularly when they were attempting to construct summaries. Both groups found that creating summaries and to a lesser extent, formulating questions difficult and required a great deal of effort.

The ET/RT and RT only groups demonstrated movements away from extrinsic motivation in the posttest motivational questionnaire and movements toward identified, introjected and intrinsic motivations. Hence students in both the ET/RT and RT only conditions as well as the control tended to approach and remain on-task (Deci et al, 1991). The ET/RT appeared to increase scores on the introjected scale as depicted on the graphed data (Chapter 6, Figure 6.7) and the RT only scored higher on the intrinsic scale at posttest which may demonstrate that students in both groups were showing increased interest in participating in the reciprocal sessions and reading comprehension activities. Furthermore, feelings of helplessness which often characterise the at-risk student, may have lessened with students voluntarily responding to reading activities (Deci, 1990). Deci also argues that higher levels of intrinsic and introjected motivation contribute to an increase in conceptual understanding. The present study may consolidate Deci's finding in that many students in the ET/RT and RT only conditions manifested increased motivation and both groups scored significantly on the daily comprehension assessments and the PEP reading test which reflected conceptual understanding.

A teacher who is autonomously-orientated, values and supports students' attempts to apply learned strategies to tasks and provides positive feedback (competency orientation) and relates well to students (relatedness orientation) will play a critical part in enhancing student motivation. Reciprocal teaching meets these needs as shown, as the teacher selects moderately challenging, meaningful material which ensures some form of success and encourages students to work within their zone of proximal development. Further, the reciprocal teacher initially provides scaffolding, gradually assuming the role of coach which assists in developing student's autonomy as they begin to own their own learning.

Proximal, step-by-step goals will affect the use of strategies and metacognitive development (Schunk, 1990). Reciprocal teaching emphasises the joint construction of text through personally set goals which are short range. The setting of such goals enhances motivation which in turn affects strategy implementation. Both ET/RT and RT only groups demonstrated improvements in reading comprehension fostering and monitoring skills through scores obtained in daily comprehension passages and the PEP test which could be linked to an associated increase in introjected and intrinsic motivation.

Students in the ET/RT group made a significant move towards identified and introjected motivational states (refer to Chapter 6, Figures 6.7 and 6.8). While those students who scored highly in the posttest identification scale could not be categorised as autonomous learners, identified regulation does represent greater autonomy than extrinsic motivation as there is a tendency to approach tasks positively and to develop adequate coping strategies (Ryan & Connell, 1988). However tension and pressure still exist and there is a lack of consistency between this other identifications. A major goal of reciprocal teaching is to provide opportunities for students to become autonomous learners, primarily through scaffolding and reciprocal dialogue whereby

the teacher gradually relinquishes control over learning to the student (Means & Knapp, 1991). Jones et al (1987) described successful learning as a motivation to construct meaning, autonomous learning, which is organised and strategic. The students with the identified motivational styles could not then be perceived as successful learners in the sense that they did not possess self-regulated behaviours. The present study could shed further light on the link between motivation and increased metacognitive understanding by examining individual variability in motivational scores and reading scores and attempt to ascertain whether there is a link between identified motivational scores and lower reading comprehension scores.

Teacher explicit emphasis on the value of strategies has been shown to affect motivation (Bruce & Chan, 1994). The students who assumed identified motivation patterns may have needed more explicit encouragement to move to a more challenging level. Further constructive feedback and praise may have been required by these students in order to increase their motivational levels. These students may not have participated as fully as others in the reciprocal dialogues and hence experienced limited constructive feedback which is imperative in enhancing motivation (Lysynchuk et al, 1990). A sense of autonomy is purported to be a critical factor in the development of introjected and intrinsic motivation and constructive feedback is lessened if the feedback is not part of the support for autonomy (Deci, 1990). Feedback assists students in seeing themselves as strategic thinkers and they are motivated to continue thinking strategically and selecting and implementing learned strategies to appropriate tasks.

Motivation is enhanced in the cooperative group setting (Sawyer, et al, 1992). Effort is valued and groups provide social support for students trying to understand and effectively apply strategies and provide encouragement and feedback. Perhaps there was not enough actual dialogue and hence scaffolding in the ET/RT group as they

experienced five fewer dialogue sessions that their RT only counterparts which may have contributed to some students in this group developing identified motivational patterns. Dialogue and scaffolding are crucial factors in the at-risk student making this transition to an active learner. Students were 8 to 9 years of age and may have been too young to cognitively embrace the four reading comprehension strategies. As students experienced less reciprocal dialogue, perhaps they required more feedback to give them feelings of competence, relatedness and a gradual sense of autonomy.

It is common practice in most primary schools to introduce metacognitive and cognitive strategies from third grade. When the study was conducted most of the students had only just entered third grade and as such were newly introduced to metacognitive knowledge and strategies. Infant schooling in both mainstream classrooms consisted largely of phonics and vocabulary development with limited comprehension exercises. The intervention began in the first term of the school year for school one and the second term for school two. Hence students were relatively unfamiliar with the comprehension tasks that emphasised metacognitive aspects of learning. Little experience of metacognition with regards to reading comprehension may have affected the ET/RT students' subsequent motivational styles, especially students who developed identified motivational patterns. Students with this motivational pattern may have felt pressure to perform. The initial week of explicit teaching may have contributed to students' perception of pressure especially when these students compared themselves to the RT only group which was involved in reciprocal dialogues. Students in the ET/RT group commented that they were 'working harder' than the other group and felt this was unfair. Perhaps the individual seatwork when students engaged in stencil worksheets concerning the four reading comprehension strategies enhanced this perception of students in this group working harder and contributed to feelings of pressure and stress.

The classroom has a major influence on motivation patterns (Ames, 1990; Ames, 1992; Ames & Archer, 1988). Instructional intervention and the change in motivational patterns from extrinsic to intrinsic are diminished if the child returns to an ego-orientated rather than to a task orientated classroom. Perhaps some of the mainstream classrooms in the targeted schools tended to be performance goal orientated which would have hindered motivation for some students.

Participation In The Mainstream Classroom

Increased levels of mainstream classroom participation were hypothesised to occur from pre- to post-analysis of the behaviour questionnaire. No change was expected in the control group. Once again the control group yielded markedly higher initial scores on all four scales (effort; compliance; initiative and participation) in the pretest behaviour questionnaire than the ET/RT and RT only groups. The control group's means were significantly different from both the RT only and the ET/RT groups' means, but the RT only and ET/RT group means were not significantly different. The control groups mean remained at this relatively higher level at the posttest stage suggesting that there was not change in mainstream classroom behaviour from pre- to posttesting. The RT only and ET/RT groups did manifest improvement in their mean scores on all the four scales (refer to Chapter 6, Figures 6.11, 6.12, 6.13, 6.14). Essentially, the ET/RT and RT only had caught up with the control group achieving with the control group levels comparable to the motivation posttest data.

The control group had higher scores at the pretest stage than the ET/RT and RT only groups for all for scales on the behaviour questionnaire. It appears that they were perceived by their teacher to be compliant, as showing effort when attempting familiar and unfamiliar assignments (concurs with their initial lower level of extrinsic motivation in the motivation pretest questionnaire), and showing initiative when

attempting to understand assignments by doing extra work and research in the pretest behavioural questionnaire. They also scored highly in the pretest questionnaire on the participatory scale which has been identified by Finn (1991) as being a key factor in academically at-risk students remaining in the educational system. Thus the control students were perceived by their teachers as not needing to be reprimanded on a regular basis, as contributing when group and class discussions were taking place, as manifesting cooperative behaviour by not interfering with peers whilst they were engaged in tasks and they were often viewed as remaining on-task in that they did not fidget and rock on chairs.

As in the pretest high scores encountered in the motivation questionnaire, the control group's surprisingly high scores obtained in the pretest stage could be due to student and teacher reactivity, age, temperament and mainstream classroom experiences. Furthermore, teachers varied in their experience and understanding of metacognition and were not specifically trained in metacognitive development and enhancement of metacognition. It may be possible that some teachers were strategic thinkers and others were not (Borkowski & Muthukrishna, 1992) as some had previous inservicing and background theory from university training. The classroom teacher's particular orientation may have influenced their initial assessment of students' behaviour in their classroom. Some teachers actually conferenced with students when attempting to complete the pretest questionnaire, instead of observing and then completing the questionnaire themselves. This factor arose in a second meeting with teachers in the initial week of the intervention. This also suggests that teachers may not have taken the questionnaire seriously and by extension the teachers may have been influenced by the experimental condition at-risk students in their classes were assigned to, rather than responding solely to the at-risk student's actual behaviour as presented in the classroom.

It was shown when the results were statistically analysed at the post-intervention assessment that the at-risk students in the ET/RT and RT only conditions obtained improved teacher ratings in the areas of effort, compliance and initiative in the classroom. Both the ET/RT and RT only groups were rated by teachers as improved in the mainstream classroom by adhering to classroom rules, raising their hands to ask questions, putting effort into completing familiar and unfamiliar assignments, answering questions which were directed at them, following directions, showing initiative, completing homework on time and engaging in class discussions. The ET/RT group was rated by the teachers as making greater improvements in effort than the RT only group, but other than this scale, both groups improved at the same rate. Students in this group also obtained significant increases in the effort scale on the posttest behaviour questionnaire. This increase in effort may have assisted students in remaining on task in attempting to complete all aspects of the PEP reading test. Indeed the effort scale focuses on students trying to finish assignments even when they are difficult and putting effort into completing unfamiliar assignments.

An increase in the participation scale was indicated in the ET/RT and RT only groups in the posttest scores on the behavioural questionnaire. Academic success is related to students identifying with the school process (Finn & Cox, 1992). If reciprocal teaching is facilitative with withdrawn students it may also be if implemented within the regular classroom. In particular, identification with the classroom teacher and wider acceptance by peers could be facilitated by the regular use of reciprocal teaching in the mainstream classroom. Scaffolding, a major feature of reciprocal teaching, during discussions encourages students to participate and the dialogue and scaffolding are critical in the development of active learning.

Participation in the classroom by the ET/RT and RT only could also be enhanced by particular classroom environments the students experiences. Some students may have

experienced more individual seatwork activities with little opportunity to develop prosocial skills by interacting in group situations. Reciprocal teaching can assist students in developing prosocial skills which will aid them in participating in class by teachers modelling appropriate group skills (i.e. turn-taking) and peers shaping each others communication skills.

Implications For Future Research

Consideration of the implications for future research focuses on the actual reciprocal teaching format, the targeted student population (in this case, academically at-risk students), external validity of the present intervention, the feasibility of adapting reciprocal teaching to the mainstream classroom and the significance of the wider school environment.

The effectiveness of reciprocal teaching is largely influenced by the students being able to work in cooperative groups, an ability to turn-take, willingness to participate, the students knowing when to listen and providing positive feedback to one another. Thus peer interaction is a salient feature of reciprocal teaching. Joint understanding and resolving of ambiguous or confusing aspects of the text is sought. These forms of interaction require good social skills in order for the reading comprehension monitoring and fostering skills to develop. The at-risk students involved in the study found it difficult throughout all the sessions to provide support and feedback to the student in the dialogue leader role. In particular students did not listen when required. Trained teachers are required in order to make reciprocal teaching effective. Borkowksi et al (1989) found that teacher explanation is a critical feature in reciprocal teaching. Teachers need to be specifically trained to explicitly teach strategies, provide feedback, and prompt when strategies should be used. Trained teachers provide more complete explanations than nontrained teachers. The teacher supports students by guiding when

necessary, prompting and restructuring or elaborating on student answers. Teachers require inservicing on promoting group cohesiveness and behavioural management particularly with regards to this targeted student population. Downing (1994) found that teacher warmth, support and positive approach to learning and students facilitated at-risk students in experiencing academic success. Downing also points out however that teachers need to be skilled in counselling techniques in order to effectively communicate with the at-risk student.

Metacomprehension strategies need to be embedded within lessons in ways that minimise the cognitive load associated with strategy use, or that create the opportunity for learners to learn and practice the strategy independent of the specific lesson (Osman & Hannafin, 1992). Perhaps as Rosenshine and Meister (1994) suggest teachers maintain this intensive support throughout the reciprocal dialogues in order to assist students to become long- term strategy thinkers.

Lysynchuk et al (1990) transformed goal setting into proximal goals which were further subdivided into a step-by-step sequence. For instance if it was made clear to the students that they were learning the skills of questioning on a specific day, then they were given practice in it. This was purported to enhance motivation and improve standardised reading comprehension in poor readers. Borkowski et al (1989) and Lysynchuk et al (1990) found greater long-term maintenance of reading comprehension strategies by children when the strategies were taught with the use of mind maps which tend to be a form of shaped self-instruction (i.e. visualisations) than when they were taught conventionally. Fading procedures to promote internalisation of strategy use could have been implemented.

The design of the study limits the generalizability of the results. The text materials employed in the study were restricted to expository paragraphs. Although expository

paragraphs comprise a significant amount of students' reading content, they have very different text structures from other paragraph types, such as narratives (Stevens, 1988). Further research is required in order to test the applicability of these strategies with other types of texts.

The fact that at-risk students were the subjects of this study limits the degree to which the results can be generalised to initial instruction in reading comprehension. It is also possible that their previous experience and failure in reading better prepared these students to learn or use specific comprehension strategies and their success would have reinforced these instructional strategies. Thus, their previous failure may have made them somewhat more aware of their need for specific types of strategies, and their success would have reinforced these instructional strategies. Further research with elementary level students, particularly in the initial stages of comprehension instruction, may help to shed some light on some of these issues.

Silent reading of the text can prove a limitation when dealing with this student population. It is difficult to ascertain which students are not comprehending the text. Reading aloud would be an attempt to overcome this problem. If one examines more closely the daily reading passage scores, students who did not score highly were indeed students who were not participating in the reciprocal teaching sessions (as indicated in transcripts). Perhaps these students did not comprehend what was read and needed further explicit support via reading aloud of the text. Further research findings suggest that the younger the student the more faulty the comprehension of set texts (Garner & Alexander, 1989). Lower ability students have also been identified as having a greater inclination towards faulty comprehension. Students' articulation levels could have been increased by having teachers regularly encourage students to verbalise their internal dialogue in the classroom.

It is argued by recent researchers that age is a critical factor in the development of reading comprehension fostering and monitoring skills, (Rosenshine & Meister, 1994), a finding that was not replicated in the present study. By the middle primary grades it is suggested that discernible gaps are evidenced in metacognition between at-risk students and the more advantaged students and this gap widens as the at-risk child progresses through the educational system (Collins et al, 1991; Waxman-Hersholt & Padron, 1995). Some researchers suggest that we need to wait until students are cognitively ready to embrace reading comprehension fostering and monitoring strategies. Others argue that we do not need to wait until late primary or high school in order for the at-risk student to more effectively cognitively embrace reading comprehension strategies as they are capable of developing some metacognitive knowledge as early as in kindergarten or first grade. The present study demonstrated successful reading comprehension skills associated with the third and fourth grade primary level. What is preventing the at-risk student in understanding at an earlier age what his or her higher achieving counterpart comprehended prior to school may be due to several factors. Perhaps it may be faulty knowledge bases and not maturational considerations which need to be taken into account when we look at why at-risk students in intervention using primary grade students are not correctly applying strategies. Indeed, Means and Knapp (1991) found that students were capable of applying metacognitive knowledge as early as first grade. Thus, we may need to look at enhancing knowledge bases rather than waiting for students to be cognitively ready to understand comprehension strategies.

Retraining of dysfunctional attributional beliefs may be required as intensive strategy training alone does not modify attributional beliefs about the utility of effort, (Borkowski et al, 1989). Attributional beliefs are often reinforced by home and within the context of the classroom. The most efficient way of combining attributional training with reading strategy instruction is to provide attributional training in the

context of a non-reading task (thus allowing strategy attributions to be established to some extent) before combined strategy and attributional training on the reading task. A limitation of the present study may have been that the attributional training was incidental rather than a very intensive component of the intervention. Children need to be metacognitively aware of mechanisms by which strategies achieve their effects, and not just knowledge that a strategy can be effective, before generalisation of strategy use can be expected. Thus could be achieved by training students to attribute learning successes and failures to the use or non-use of effective strategies. Limited research has been done in the development of attributional beliefs regarding use of strategies (Chan, 1994). Ultimately, the "selling" of metacomprehension strategies is probably as important as the specific manipulations involved.

Teachers need to identify with the reciprocal teaching format and change it to suit the needs of their students and their own teaching styles before it can operate in a classroom (Marks et al, 1993). There will be a need to gain the confidence of teachers as this sort of classroom is distinctly different from the traditional primary classroom. The roles and responsibilities of students have essentially been redefined (Borkowski et al, 1989). Initially the teacher is largely responsible for learning, but in time the students assume greater responsibility for their own learning.

Matching each student's reading level to appropriate reading material is a difficult problem for many teachers. The principle that students read most successfully if the reading material matches their own reading level is easy to accept but hard to put into practice (Dupuis, 1980). Cloze procedures are a means of matching student reading level to appropriate literary selections, with its greatest usefulness in its application to short stories.

Tests need to reflect the main strategies taught. Thus, near-transfer tests need to be

used as opposed to far-transfer tests (Jacobs & Paris, 1987). More research is required into how to structure these tests and to incorporate them into a system which relies largely on standardised testing procedures. Standardised tests often do not tap into metacognitive knowledge and awareness of strategy use.

Teachers in most classrooms may tend not to motivate strategy use and to encourage appropriate attributions relevant to prolonged strategy use. Teachers rarely describe the actual thinking processes behind the extraction of meaning from a text and these verbalisations are critical in the development of metacognition (Garner, 1990). According to Paris and Winograd (1990), teachers often assume that asking questions and receiving answers is dialogue, when it is recitation. Dialogue involves collaboration. Teachers tend to teach the strategies in isolation with little attempts to relate them, and do not focus on monitoring strategies. Classroom goals are often performance orientated which could adversely effect on strategy use and the motivation to use those strategies on multiple tasks.

CHAPTER EIGHT.

CONCLUSION

This research has identified the important role metacognition plays in the development of reading comprehension strategies in the academically at-risk primary grade student. Metacognitive strategies are increasingly required not only in the development of reading comprehension skills but in all academic domains as the child moves through primary and into high school. It is of vital importance to explicitly teach metacognitive and cognitive reading comprehension strategies to at-risk students because if they are not taught metacognition in primary school, these students tend not to develop these strategies later on.

The at-risk primary grade student has been frequently identified as having limited metacognitive strategies due to impoverished experiences at home and in the educational setting. Pretest standardised reading scores and daily comprehension statistical data in the present study indicated low reading comprehension skills and concur with recent research findings that at-risk students have limited metacognitive and cognitive reading comprehension strategies. This study contends that deficits reside in the school system and not in the at-risk students themselves and these deficits negatively affect reading attainment levels (Stanovich, 1991). At-risk students cannot 'read' the classroom as well as high achievers and do not understand cognitive strategies when as is often the case, they are implied by the classroom teacher. To compound the problem further, at-risk students are usually withdrawn into remedial classrooms where drill and practice teaching methods are emphasised and conceptual understanding is non-existent and can therefore lead to dramatically decreased reading comprehension skills. These school experiences combine and significantly contribute to limited reading experiences for the at-risk student.

The school system needs to change to fit all children. A reshaping of the curriculum is urgently required so that complex, meaningful problems and specific instructional strategies become the focal point. Reciprocal teaching is a technique which provides an educational framework that can meet the varying needs of at-risk students in the primary grade classroom.

This research strongly suggests that reciprocal teaching effectively meets the academic and affective needs of the at-risk student. The academic needs of the middle primary grade student were effectively met in that at-risk students in both the ET/RT and RT only experimental conditions improved in reading comprehension scores with regards to the PEP standardised reading test and the daily comprehension assessments. Furthermore both groups maintained this improvement over a sustained period of time (six weeks). In addition, students increased levels of participation in the mainstream classroom, classroom participation according to Finn (1991) being critical contributing factor in academic success. Reciprocal teaching taps into students' prior knowledge bases whereby tasks are made meaningful by relating concepts to prior experiences. Thus, reciprocal teaching emphasises what the child knows and not what they lack. The tasks are moderately challenging and thus emphasise students' existing skills and development of them. Metacognitive and cognitive strategies are made overt and explicit through active dialogue, teacher scaffolding and teacher and peer constructive feedback in reciprocal teaching and this type of instruction has been shown to increase at-risk students' reading comprehension skills. The teacher acts as a coach in the reciprocal teaching framework with emphasis being placed on students' own thought processes developed through group interactions. The teacher slowly relinquishes control and students increasingly participate in their own learning and assume an autonomous approach to learning. Initial regulation by the teacher may also promote self-regulation in the at-risk student, and this student autonomy decreases feelings of learned helplessness which often characterises the at-risk student.

Students' motivation levels affect the development and use of metacognitive strategies. The at-risk student tends to be extrinsically motivated and this pattern increases as the child goes through primary and into high school. Positively motivated students on the other hand, do not avoid challenging tasks and will repeatedly use a learned strategy until they succeed. Reciprocal teaching facilitated at-risk students in developing more positive motivational patterns in that the present study's results indicated a move away from extrinsic motivation and a move towards intrinsic motivation. Identification and intrinsic motivational patterns encourage students to be more positive and develop effective coping styles compared to extrinsic motivational styles (Ryan & Connell, 1988). Specifically, reciprocal teaching assists at-risk students in developing reading comprehension metacognitive strategies and positive motivational states in several pertinent ways. Reciprocal teaching enhances motivation by providing scaffolding so the task difficulty is measured and students are able to attempt and thus engage in the task with support. Moreover, motivation is increased by cooperative learning whereby students are actively participating in their own learning and through explicit strategy instruction and constructive feedback on the value of strategies which are critical features of reciprocal teaching. Students become more motivationally mature as they participate in reciprocal dialogues and develop reading comprehension strategies. They are gradually able to identify and appropriately use learned strategies, correct ineffective strategies, do not require a great deal of scaffolding, prompting or teacher monitoring and make evidenced improvements in performance levels in reading comprehension. Qualitative analysis of this study's results showed a maintenance of four metacognitive strategies (summarisation, prediction, clarification and questions) which may suggest that students were becoming more motivated in using learned strategies and hence achieving a sense of autonomy. There was not a marked increased in positive motivational levels however, and this may have reflected in the qualitative analysis where students in both groups were finding the reciprocal sessions repetitive after week three of the intervention. Furthermore, qualitative data suggests that some

students in both the ET/RT and RT only groups, particularly in the RT only group, were finding it difficult to formulate summaries using main ideas from the text and several students in the RT only group tended to use only literal question stems even in the final dialogue sessions. Perhaps metacognitive processes and motivational levels would be enhanced by several follow-up series of reciprocal sessions spanning a duration of 15 days so that metacognitive strategies and motivational levels would be 'boosted'.

The at-risk student often assumes a passive role in class and tend to feel alienated from the school system (Finn & Cox, 1992). In order for students to remain in the school system they need to identify with school and this is facilitated by active participation in their own learning. There are two critical aspects of participation and they involve self-initiation and responding to classroom requirements and teacher directions. Increased participation in the mainstream classroom was evidenced in the present study for both the ET/RT and RT only groups. Increased participation levels is a critical factor in academic success according to Finn (1991). The present study confirms these findings in that increased reading comprehension skills and levels of classroom participation were evidenced for both experimental groups following the reciprocal teaching sessions. Reciprocal teaching encourages participation in classrooms as this teaching technique reduces peer isolation diminishing the negative effects of teachers' labelling and low expectations and encourages active participation through reciprocal dialogue and team leadership roles in the small group situation. Peer acceptance is also increased when students work together in small, cooperative groups as in reciprocal teaching and this acceptance can be generalised to the mainstream classroom.

At-risk students will not effectively develop or maintain learned strategies however, if the classroom teacher is not a strategic thinker (Pressley et al, 1992) or the classroom is ego-orientated (Ames & Archer, 1988). In reciprocal teaching a teacher is trained to

think strategically and thus values students' persistence in applying previously learned strategies, encourages planning and reflections and provide opportunities for students to engage in metacognitive tasks without emphasis on completing everything at the expense of understanding. Classroom teachers need inservicing on the reciprocal teaching technique as this is a teaching program which will benefit at-risk students in reading to understand, in developing effective coping strategies and in being accepted into the mainstream classroom with the wider implication being acceptance into the school system and perhaps generalised acceptance into wider society.

The highly beneficial effects of reciprocal teaching will be significantly reduced if classrooms, the teaching staff and school community value success at the expense of understanding. Reciprocal teaching promotes a mastery orientation and mainstream classrooms need to reflect this as mastery orientated classrooms reduce competitiveness with others, increase involvement in learning, offers experience of success for all, and students are more likely to use effective learned strategies.

To enhance the effectiveness of reciprocal teaching in the classroom it is necessary to reshape the emphasis reciprocal teaching is given in the academic domains. It is not a matter of just adding reciprocal teaching to the existing curriculum. The whole curriculum needs to be reshaped in order to teach metacognitive skills in that complex meaningful problems and explicit teaching of strategies are emphasised. In addition teachers need to fully understand reciprocal teaching. The at-risk student experiences the whole school environment which shapes motivation, metacognition and behaviour in the classroom. At-risk students require positive expectations, warmth, interest, specialist teacher training, effective and caring wider staff, active teaching of prosocial skills, and active empowerment of students in their own learning. Thus the students academic, affective and social behaviours must be taken into account in order for reciprocal teaching to be most effective as a teaching format used to develop at-risk

student's reading comprehension fostering and monitoring skills.

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APPENDICES

APPENDIX 1.

List Of Criteria Used To Identify At-Risk Students

1. Attending an S.T.L.D. Class

2. Frequent Absenteeism from School

3. Student has not progressed into the next grade - grade retention

4. Average to high I.Q. (When tested by the counsellor).

5. Course Failures - in academic domains

6. Slow or fast track in mathematics class

7. Low S.E.S. (Socioeconomic Status)

8. Parental Unemployment

9. Parental Grade Retention when the parent was at primary or high school.

10. Parents dropped out and did not matriculate from high school.

11. The student speaks using a restricted language code (Bernstein, 1950's).

12. Isolation from peers in the classroom and when noted in the playground environment.

13. Extrinsically motivated when approaching set tasks in the classroom.

14. Class test scores - as obtained via classroom teacher assessments. Grade C or D will be noted.

APPENDIX 2.

Example of Cue Cards Used In Reciprocal Dialogue Sessions

Side One: Four Reading Strategies

Summarisation:

A summary is one or two sentences that tell the most important ideas. If a summary is not in the first or last lines of the passage, a list of the main ideas is written and then put into sentences to make a summary. Remember to keep the summary short and to the point.

How To Ask Good Questions:

Good questions ask about important information rather than unimportant information. Special question words are: Who, What, When, Why, Where, Is, Are, How.

Predicting:

You can find clues in the paragraph that might tell you what will happen next. The title of the story is the first clue that will help you predict future events.

Clarifying:

You can often figure out the meaning of a difficult word or idea by reading or listening to the sentence in which it is used.

Side Two: How To Ask Good Questions

WHAT would happen if . . . . ?

WHAT does . . . . mean?

WHY is . . . . important?

HOW are . . . . and . . . . similar?

EXPLAIN why . . . .

EXPLAIN how . . . .

DESCRIBE . . . . in your own words.

APPENDIX 3.

Cumulative record of students' daily graphed reading comprehension scores used as a form of feedback.
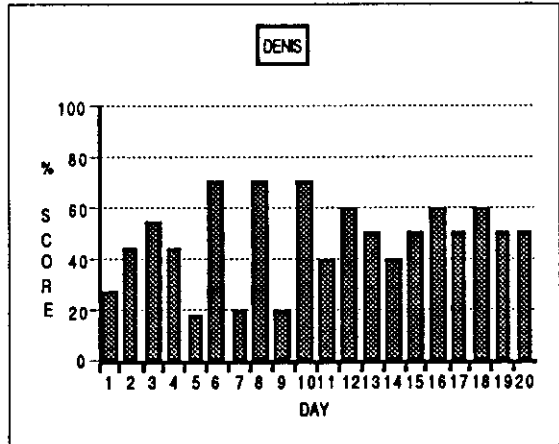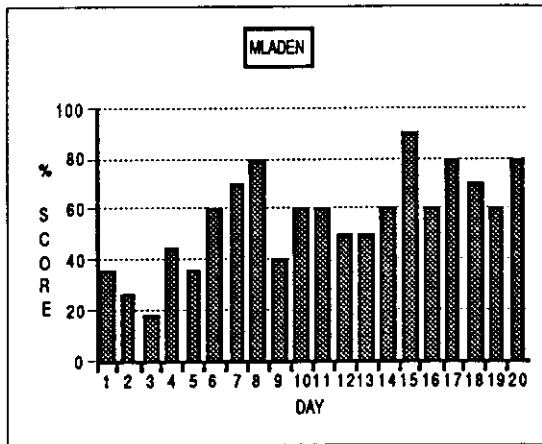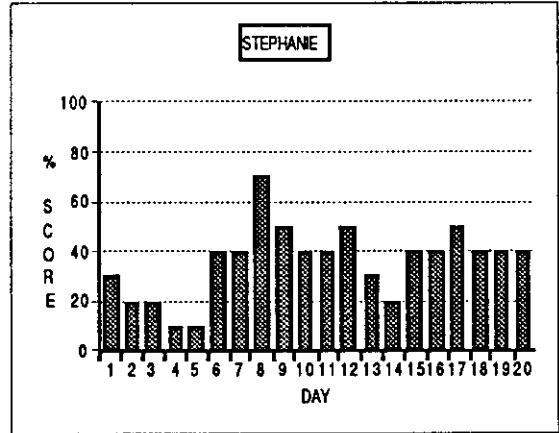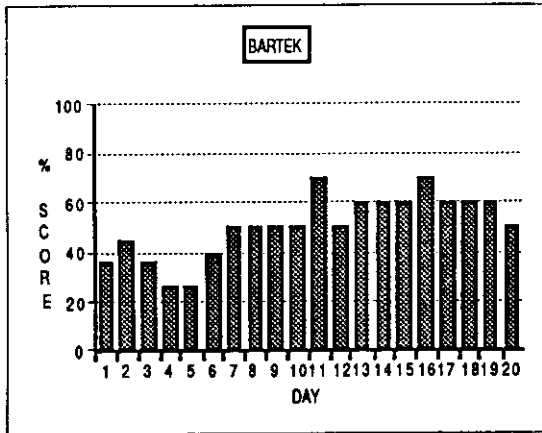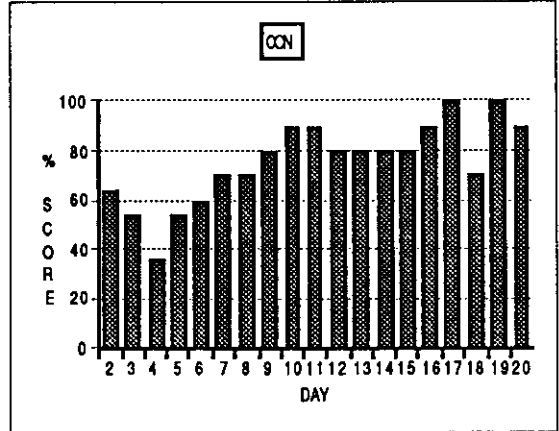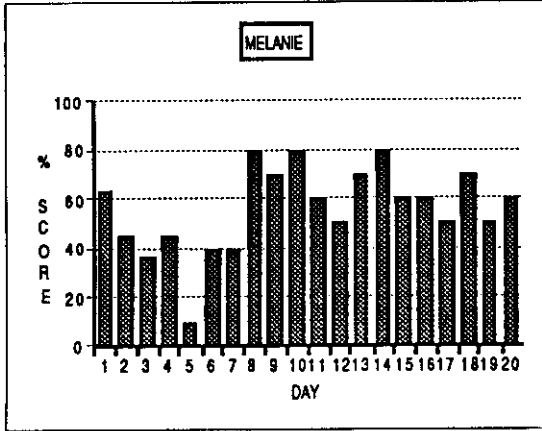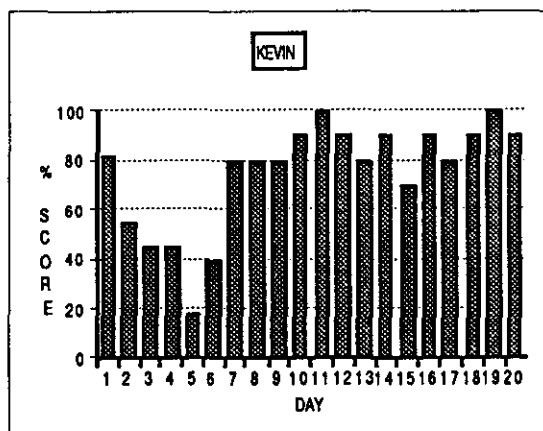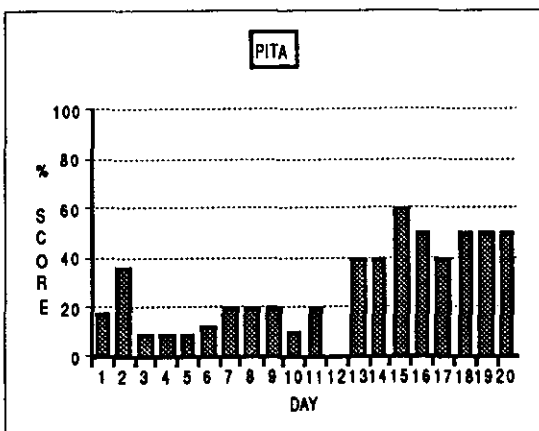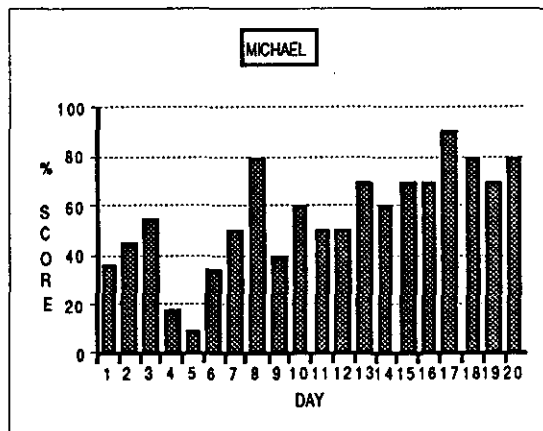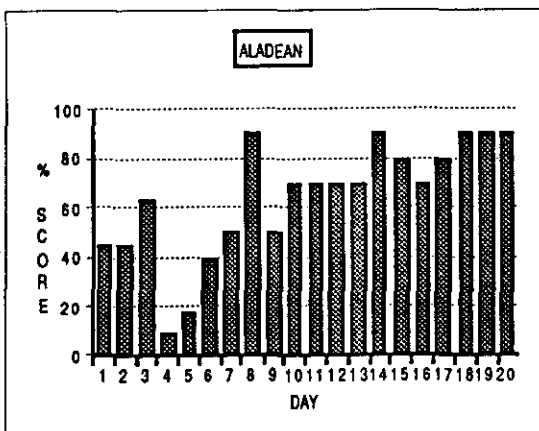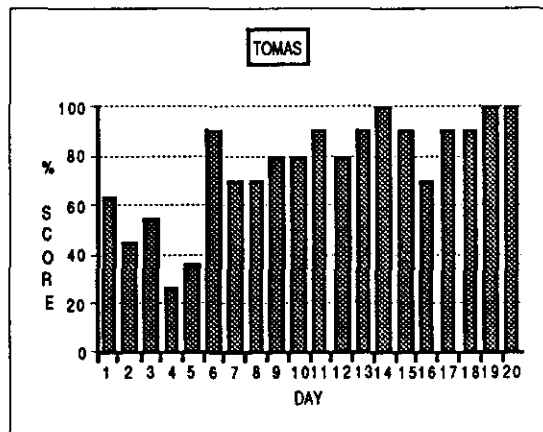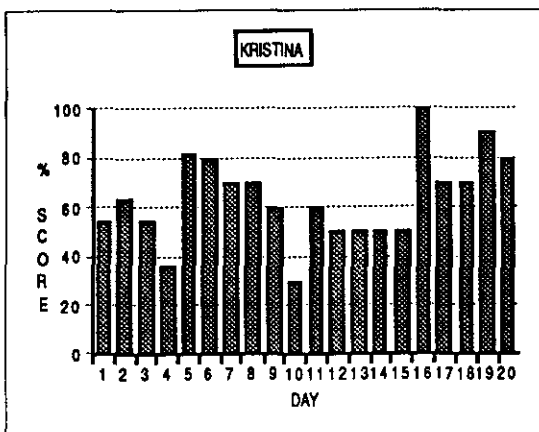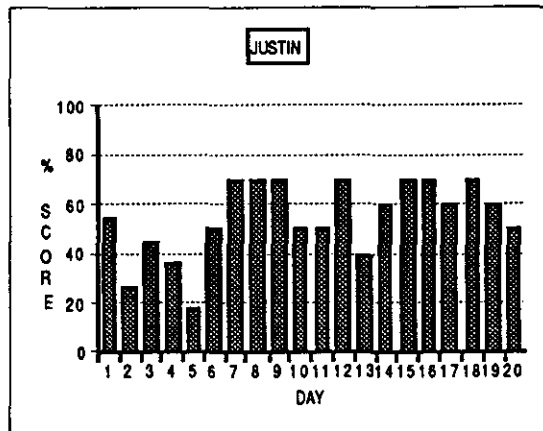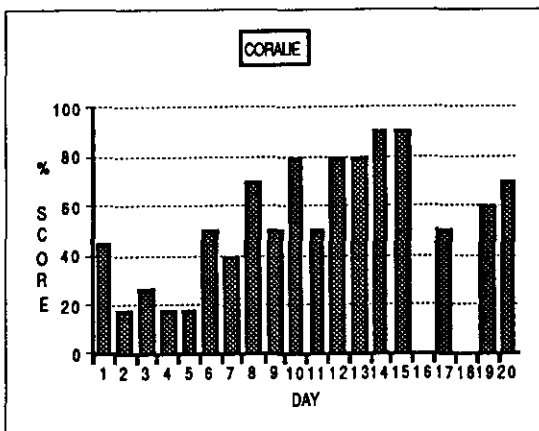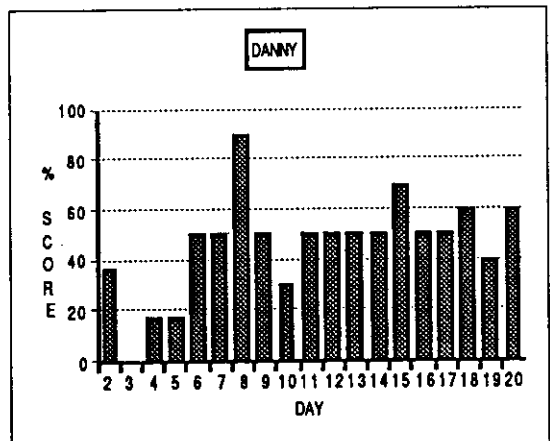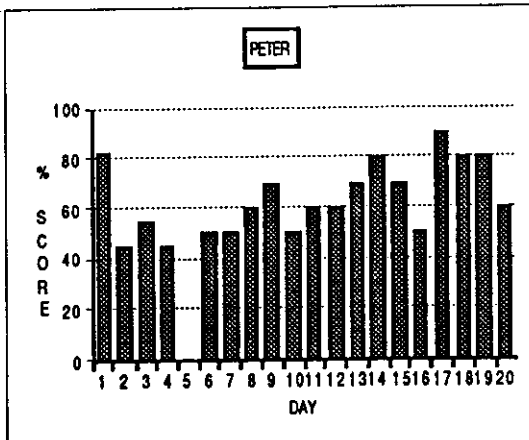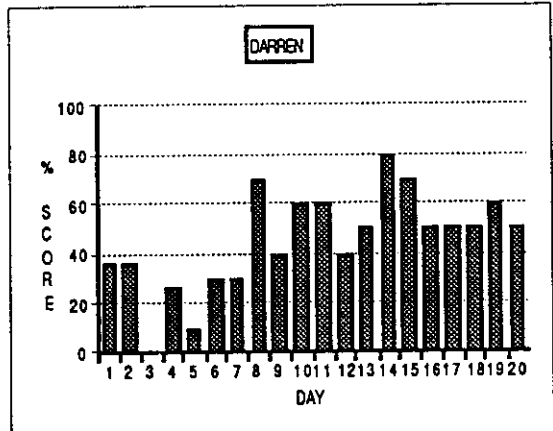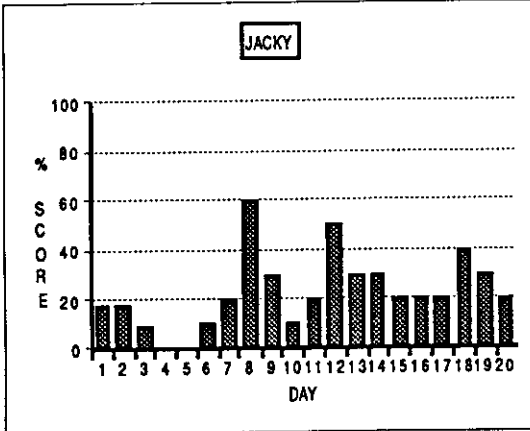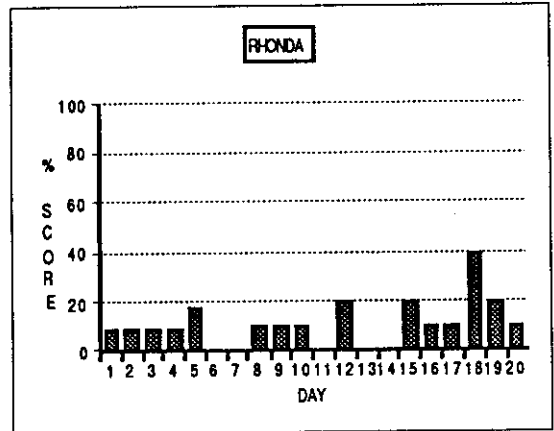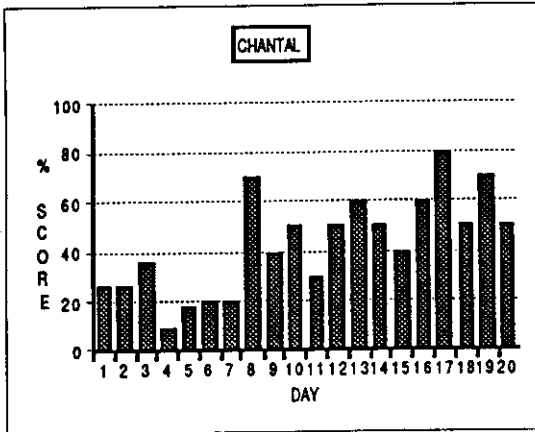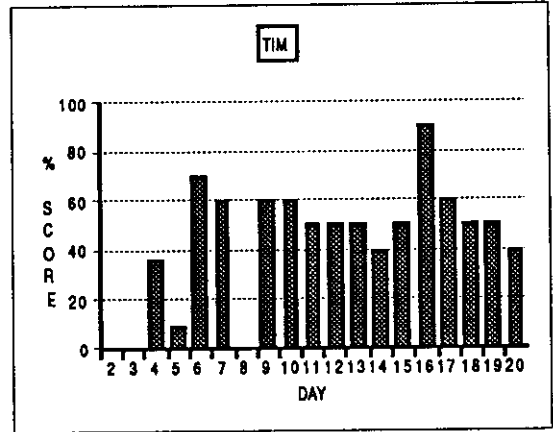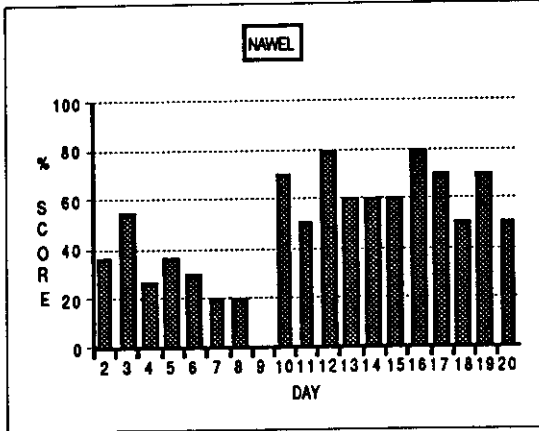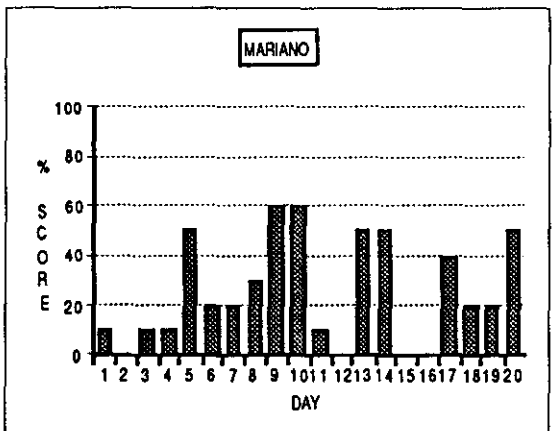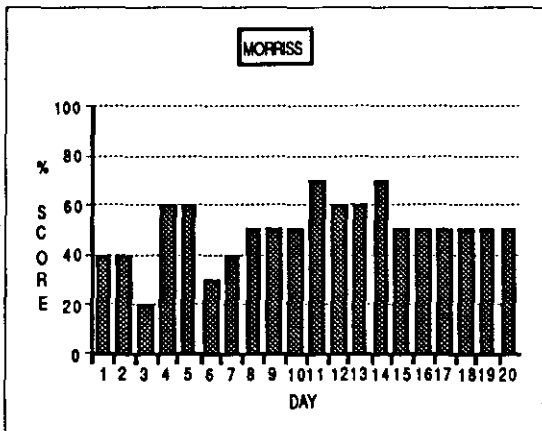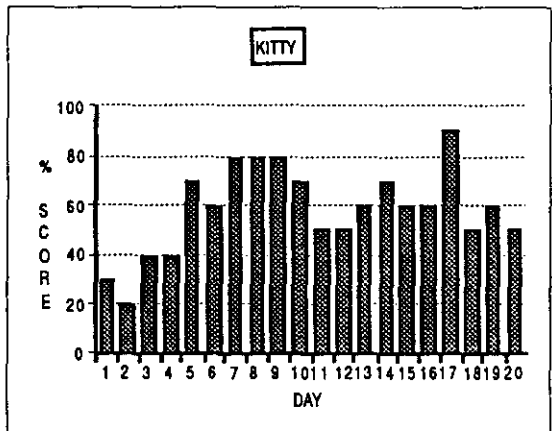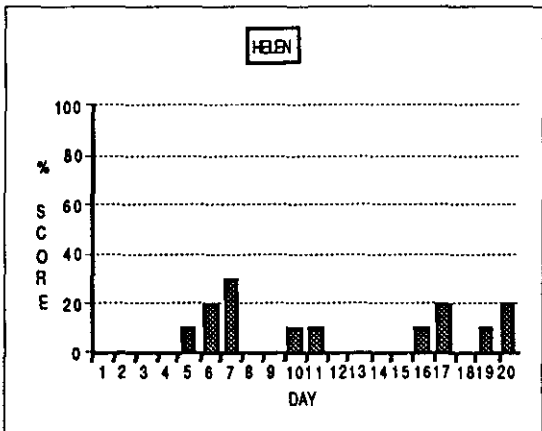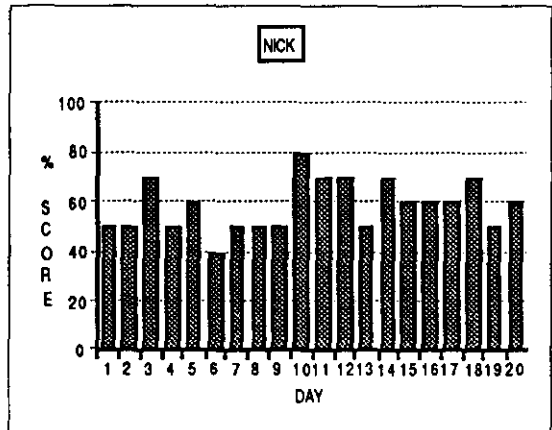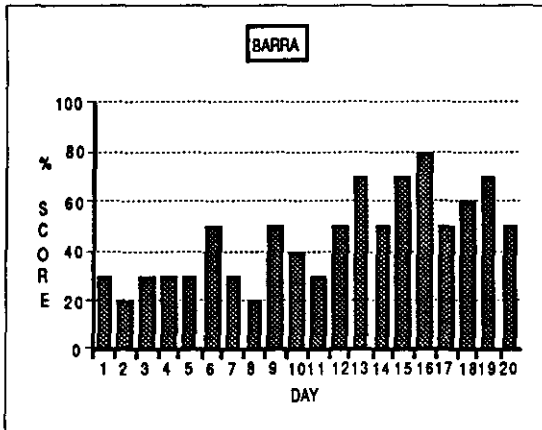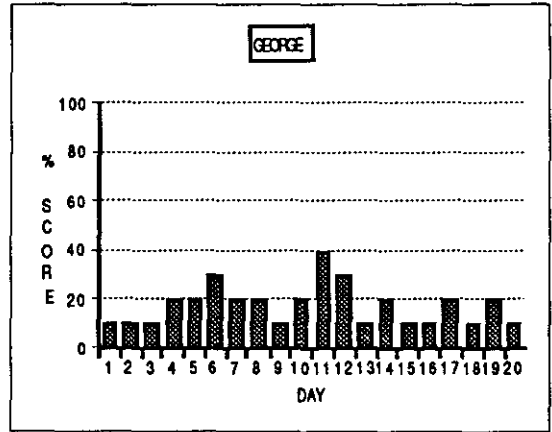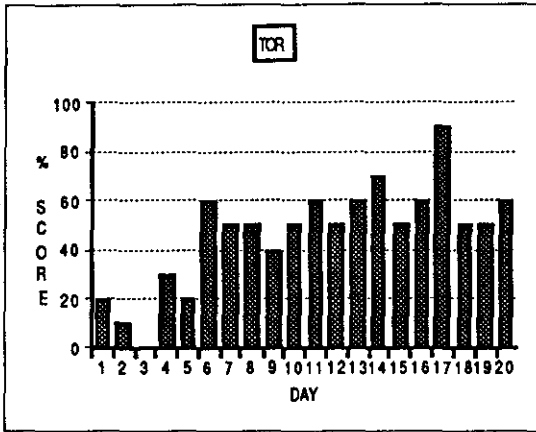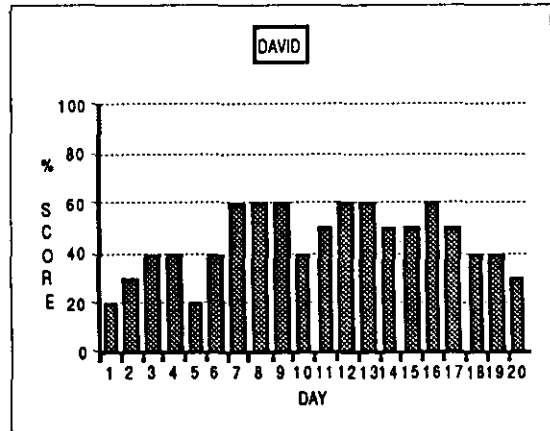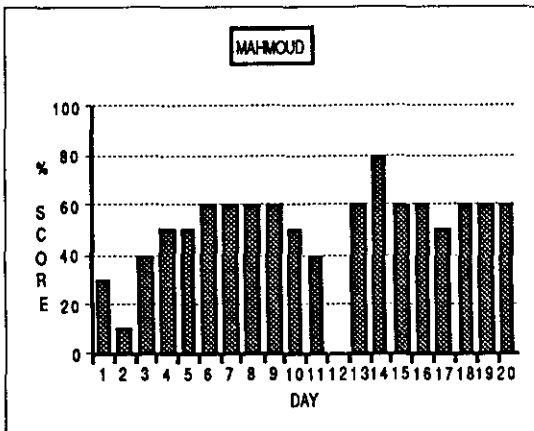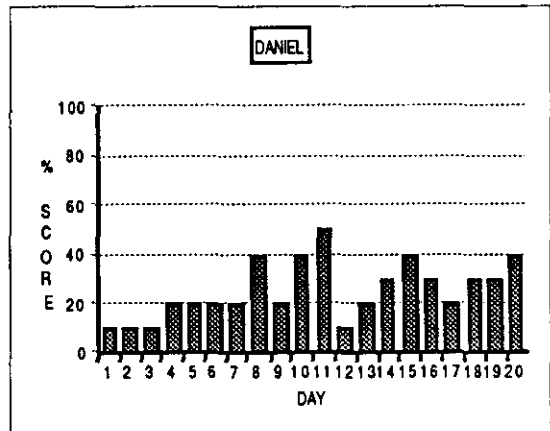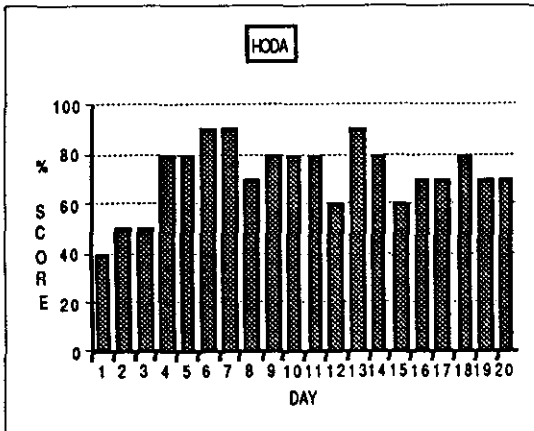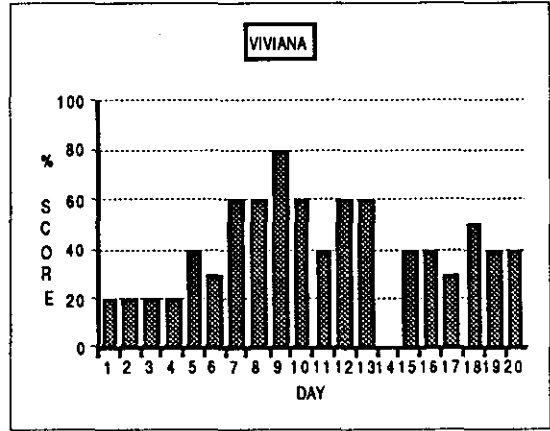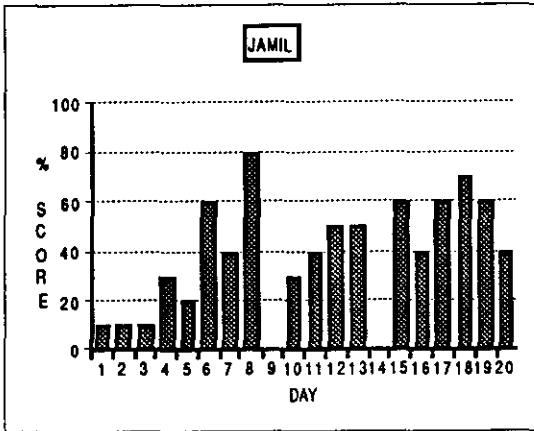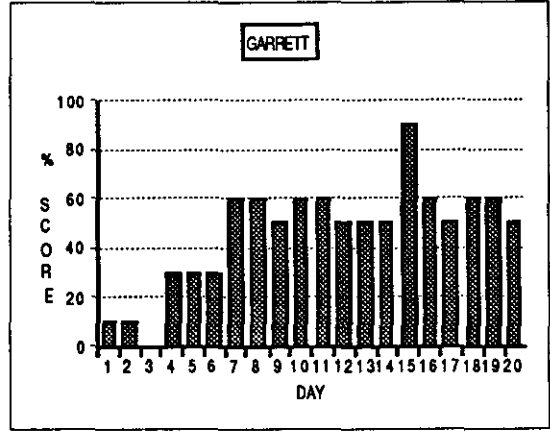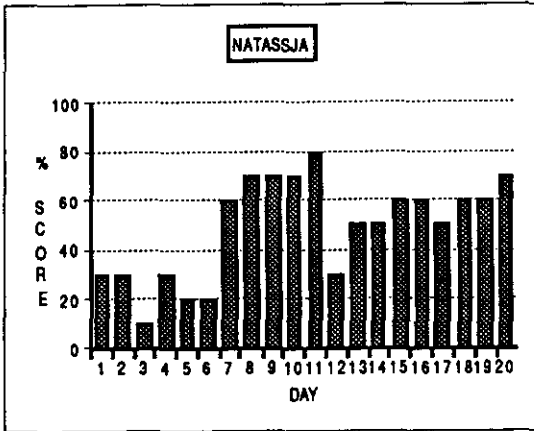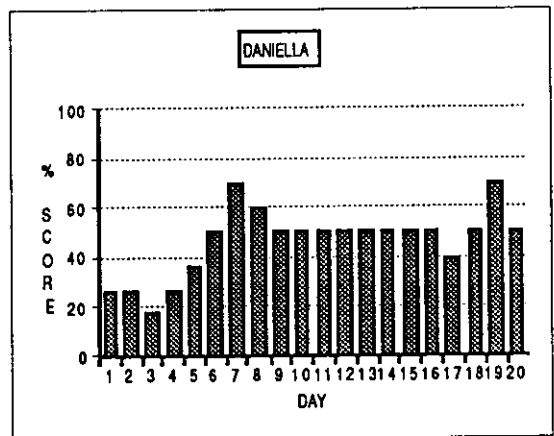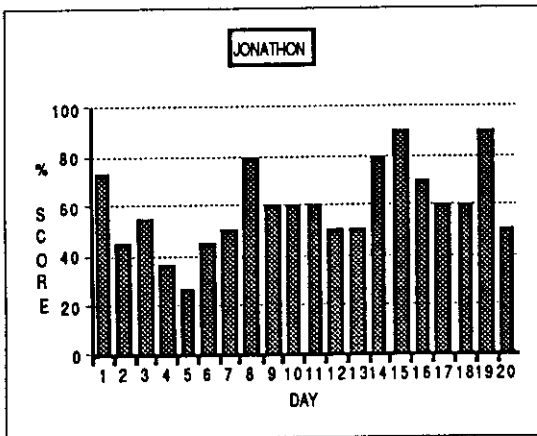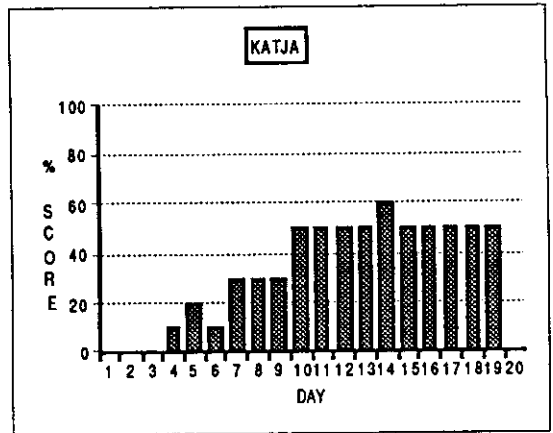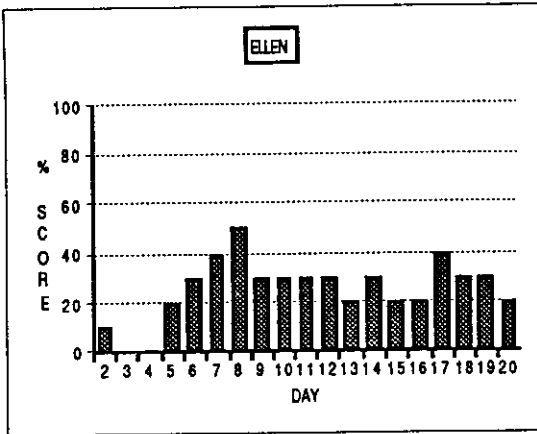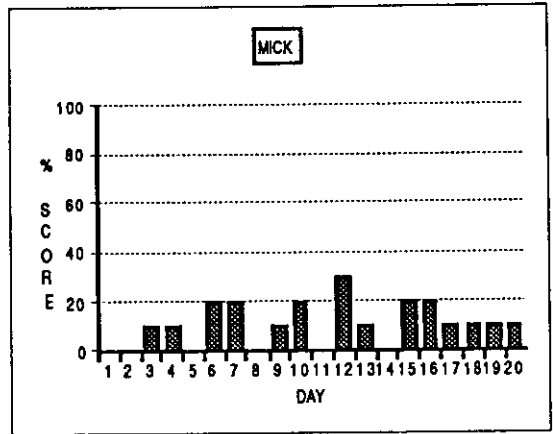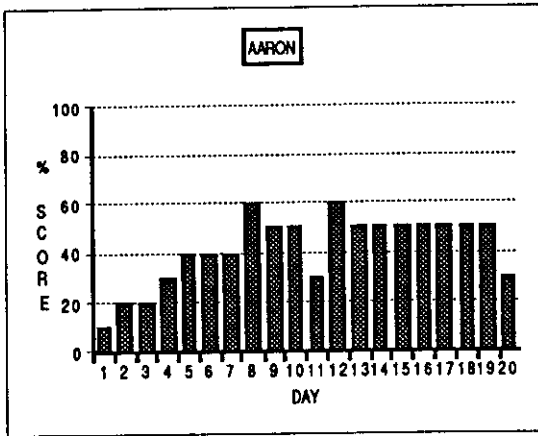
APPENDIX 4.

Practice Examples Of The 4 Reading Comprehension Strategies As Used By Palinscar & Brown (1984;1987;1989)Presented To The ET/RT Groups Prior To Reciprocal Dialogue Sessions

A) <u>Clarifying</u>

1. You may have heard about the long winter sleep that some animals take. This long winter sleep is called <u>hibernation</u>.

    a. Were there any words that you did not understand?
    b. What does hibernation mean? How could we figure out what this word means?

2. Caterpillars have long bodies of twelve parts, or segments, and heads with six tiny eyes.

    a. Were there any words that were unclear to you?
    b. What are the <u>segments</u> of a caterpillar?

Practice clarifying the meanings for the underlined words by using information that is provided in the text.

3. Cats have many ways of "talking" with one another. Purring is just one way in which they <u>communicate</u>.

    a. What does <u>communicate</u> mean?
    b. Who does 'they' refer to?

4. There are many kinds of snakes in the United States. Several <u>varieties</u> are less than one foot long.

  a. What does <u>varieties</u> mean?

5. A snake's body is very <u>flexible</u>. It can bend and twist very easily.

  a. What does <u>flexible</u> mean?

  b. What does 'it' refer to?

6. Soil in your garden is very <u>fertile</u>. It has lots of minerals.

  a. What does <u>fertile</u> mean?

  b. What does 'it' refer to?

7. Scottish people wear <u>kilts</u>, which are skirts made of wool.

  a. What does <u>kilts</u> mean?

8. A man in worn knee pants and a hat stood on a high <u>mesa</u> in the fierce sun. He looked across the golden desert. Beyond the desert, in the far distance he could see only mountains.

  a. Were there any words that needed to be clarified?

  b. What does <u>mesa</u> mean?

9. Dangerous animals ran through the rocky passes. There were a great many snakes. Sometimes a <u>blue racer</u> rushed across the path, or the boy saw a <u>rattler</u> ready to attack.

  a. Are there any words that need clarification?

  b. What is a <u>blue racer</u> and a <u>rattler</u>?

10. Some divers work in the sea for days at a time without coming up to the surface. They live in an undersea building called a <u>habitat</u>, a hundred metres under the water.

  Clarifications:

11. Plants grow well in soil with <u>humus</u> in it. Humus is made up of dead leaves, twigs, bugs and worms that <u>decay</u> or rot.
Clarifications:

12. From the ship's deck, the passengers could see <u>icebergs</u>, or very large bodies of ice, nearby.
Clarifications:

13. The horse's face was marked by a large white patch, or a <u>blaze</u>.
Clarifications:

14. If you want to learn how to ride a horse, the best way is to take riding lessons. But always make sure that the horse you are going to <u>mount</u>, or get on is very gentle.
Clarifications:

15. Mary is a <u>bobbin</u> girl. Her job is to watch the thread as it comes off the large spools or bobbins. This thread is used to make cloth. When a thread breaks, she must jump up on the machine and quickly tie the ends together.
Clarifications:

16. Many different fruits grow well in the warm weather on the island. Bananas, <u>mangoes</u>, pineapples and <u>papayas</u> are just a few of the delicious fruits that are grown by the island farmers.
Clarifications:

17. Suddenly the cow kicked the lantern over. the hay on the floor burst into flames. Soon, the whole barn was in a <u>blaze</u>.
Clarifications:

B) Summarising

1. When a cat feels threatened, its whole body shows how it feels. it arches its back. Its hair stands on end. The cat might even put its ears back and make a hissing sound.

2. Each morning Andy eats bacon and eggs. He drinks a glass of chocolate milk. He also eats toast and jelly. Andy eats the same breakfast foods each morning.

3. People use paper for many different purposes. People use paper for writing and drawing pictures. Store clerks use paper to pack items so they will not break. Special papers can be used to cover walls and wrap presents.

4. Dogs need a great deal of care. A person who owns a dog must feed it every day. Most dogs need to play and go for walks to get exercise. Dogs with long fur may need to have their fur brushed daily.

5. Many animals gather and store food before the weather turns cold. Others grow longer, thicker fur. There are also birds that fly south for the winter. Animals must prepare for the cold winter months.

6. Sue and her family liked their trips to the apple orchard. They would get up early in the morning and pack a picnic lunch. They always took their own baskets to fill with apples. They picked the fruit and filled their baskets. After they paid the farmer for the apples the family would eat their picnic lunch. Everyone in the family enjoyed picking apples. They looked forward to this every summer.

7. It is a wonder that castles were ever built at all. Most of them were made so long ago that every single job had to be done by hand. There were almost no machines. So all the work was done by people. Hundreds of hundreds of men had to do all the work.

8. Every year many children join the 4H club. In the club they learn more about animals. Boys and girds learn how to take care of animals such as rabbits, horses and chickens. Chickens can be good pets since they are easy to take care of and do not cost a lot of money.

9. Farmer Brown has a barnyard full of chickens, cows, pigs, horses, goats and roosters.

10. The woman that lives next door has tulips, roses, daisies, and marigolds in her gardens.

11. Chocolate chip cookies are my favourite kind of cookie. To make chocolate chip cookies, you need several ingredients. You need eggs, milk and baking soda. You also need flour and sugar. The last think you add is the chocolate chips. Then you put small bits of cookie mix on a baking sheet and put them into the over. After 20 minutes, they are done and ready to eat.

12. Children had to get the ground ready to plant their garden. First, they raked the soil. Then they broke up big lumps of earth so seeds and small plants could be planted. Finally the children covered the soil with straw to keep it from getting too dry.

13. Simon is a large brown rabbit. He has four paws and long ears. Simon has whiskers and a mouth that twitches. He also has fur that is very soft and a cotton ball tail.

14. Care Bears are soft and cuddly stuffed animals. They come in many wonderful colours. some Care Bears are blue. Some are pink. There are even some Care Bears that are yellow.

15. The street is crowded with trucks and jammed with cars. The traffic does not move. People wait for buses that are late. The city has become so crowded with cars and trucks that they can no longer move.

16.   Slowly the big cats enter the circus ring. They don't look friendly, but the lion tamer is not afraid. In one hand he holds a hoop and in the other a whip. One by one, the lions jump through the hoop. They run into the open cage as the lion tamer follows them with his eyes.

17.   Fireworks can be exciting and beautiful. But it is important to remember that they can also be dangerous. When fireworks get into the wrong hands, they can cause very bad accidents.

C) Questioning

1.   Suppose you are going to the movie, "The Empire Strikes Back." You want to know when the first show begins. You might call the theatre to ask for some information. What question might you ask?

2.   You come downstairs and smell something wonderful coming from the kitchen. You might ask your mother: . . . .

3.   You are in a new city and are looking for some place to eat dinner. What question might you ask someone?

For each sentence below think of a question that begins with the question words that are given.

4.   John likes to play baseball.
       What . . . .
       Who . . . .

5.   In the summer, Mary likes to swim in the lake.
       When . . . .
       Where . . . .

6.   Turtles hide their eggs by burying them in the sand.

      How . . . .

Think of questions for the sentences that follow. No question words are given so you will have to think of your own. Remember to ask a question that can be answered with the information in the sentence.

7.   An octopus is a sea creature that hides in the rocks on the bottom of the ocean.

8.   When Robert's jacket fell on the floor, a dollar feel out of the pocket.

9.   Grandpa fixed a breakfast of eggs and bacon for the children.

10.   The hunters kept warm by sitting near the campfire.

Below each paragraph are 3 questions that have been asked about the information. Underline the bet main idea question for each paragraph.

11.   Many people used to die from snake bites. In the past several years, doctors have discovered a medicine that works against the snake poison. This medicine is called antivenin. If a person is bitten by a poisonous snake and gets this medicine quickly, he will not die. Thanks to antivenin, very few people in the United States now die from snake bites.

      a. Why do snakes bite people?
      b. In what country do few people die of snake bites?
      c. Why do few people die from snake bites these days?

Read each paragraph and think of a good question to ask about the most important information.

12. Wind feels different when it blows over water and land. Wind coming over water is damp. Wind that blows over land feels dry. If wind blows over warm water or land, it will feel warm. If wind blows over cool water or land, it will feel cool.

What would be a good main idea question to ask about this paragraph?

13. A dolphin named Tuffy, worked with people. The people were trying to find out about the sea. They started by building a house in the sea. The house was called "Sealab II." The people lived in that house under the water!

What would be a good main idea question for this paragraph?

14. The oldest kinds of bricks were made with mud. They were made by drying the right kind of mud. The bricks dried in the sun or over a fire. The mud baked and became hard. Sometimes people would add straw to the mud, too. The bricks made from baked mud were sometimes called adobe.

What would be a good main idea question for this paragraph?

D) Predicting

1. What do you predict you will see when you visit a pet store?

2. What kinds of shows do you predict will be on Saturday morning television?

3. What kinds of activities do you predict you will do in your holidays?

4. If you were to visit a zoo, what types of animals do you predict you might see?

5.   Lisa's parents built her a playhouse in the backyard. What kinds of things do you predict that Lisa might put in the playhouse?

6.   Your friend asks you to go to the movie. She tells you the name of the movie is "Monsters of the Deep". What do you predict the movie will be about?

Titles can be a source of information for predictions. For Each title predict what the story might be about.

7.   Facts About Animals

How To Make Kites

The World's Greatest Flying Machines

Headings and subheadings in a story can also help us make predictions. Make your own predictions about the information that might be given for the following headings and subheadings.

8.   Tomorrow: Moving Around

New Kinds Of Cars

New Spaceships

9.   Living Under The Sea

Underwater Tunnels

Submarines

Sea Habitats

Other clues in a story can help us predict what will happen next. Sometimes paragraphs and with a question or a statement about the information that will come next. After each paragraph predict what you might expect to happen next.

10.   There is a very special animal that has fins and scales. It can move in the water, but it likes to stay still. This animal is called a leaf fish. Do you know why?

11. When bees find food, they fly home and do a tail-wagging dance. The tail-wagging dance will tell other bees where to find food. Do you know about how other animals tell where to find food?

12. Alligators and crocodiles are alike in some ways. Both alligators and crocodiles are reptiles. Both eat other animals. But in other ways, alligators and crocodiles are different.

13. You are at the circus. You can hear the the clowns laughing and smell the popcorn and candy floss. In the big ring, the lion tamer is waiting for the big cats to come out.

14. A corn plant begins with a seed. The seed is called a kernel. A kernel of corn is small, hard and dry. It does not look like much. But something good happens when you plant it.

15. Once there was a wolf who wanted to catch some sheep for dinner. But he had to find a way to trick them.

16. While you lie in your bed at night, many animals outside are sleeping, too. Like you, they must rest. And each one has its own way of making itself comfortable.

APPENDIX 5.

Examples Of Transcripts In The Reciprocal Dialogue Sessions For Both ET/RT and RT Only Groups - In The Early And Final Sessions

Example Of The ET/RT In the Beginning Sessions:

WOLVES

There are two kinds of wolves - the tundra would and the timber would (also known as the grey wolf). The tundra wolf lives on vast treeless plains called tundras. This kind of country is far north in Alaska, northern Canada and the Arctic. They hunt mainly herds of caribou. the timber wolf lives farther south in forests and mountains and woodlands. Big animals like deer, moose, elk, sheep and buffalo are their favourite foods.

1. S3: How do they know where their prey is?
2. S2: 'Cos they can smell them through the wind, by their noses.
3. S1: Any other questions?
4. T: I need to stop you here. Before we can ask any questions we need to give a summary so we gain an understanding of what we've just read. Remember a summary tells the main ideas in one or two sentences.
5. S1: It's about er . . . wolves.
6. T: Good. What about wolves - the way they look, how they live . . .
7. S4: The way they look.
8. S5: No, how they live and things.
PAUSE.
9. T: We need to read the paragraph again, and then have a go at making up a summary.
    (Silence whilst the group is reading the paragraph again).
10. T: Okay, so we've read it again. Who might have an idea of what the paragraph is about?
11. S5: It's about wolves and where they live.

12. T: Excellent. Does the paragraph tell you what kind of wolves
    there are?

13. S4: Yeah, its about two wolves, the tun er the tun-

14. T: Tundra wolf and the . . .

15. S4: Timber wolf. And they live in different places.

16. T: Well done. So what we are giving as a summary is (reads from paper)-
    "there are two kinds of wolves the tundra wolf and the timber wolf (also
    known as the grey wolf)." Notice that I read the first sentence of the
    paragraph. Often the first or last sentence of a paragraph will give you a
    summary - do you remember that?

17. ALL: Yeah.

PAUSE.

18. T: Okay, you were asking some interesting questions before. Would anyone like
    to ask some questions?

19. S5: What would happen if it could not find its prey?

20. S1: Well, it would have to starve. Any other questions?

21. S4: Do the wolves always follow the leader?

22. S1: Yes, they do.

PAUSE.

23. T: I have a question. How are the Tundra and Timber wolf different?

24. S5: 'Cos they live in different parts.

25. T: Different parts of Australia?

26. S5: No, er . . . America. (Reads the paper): "The tundra wolf lives on vast
    treeless plains called tundras. This kind of country is far north in Alaska,
    northern Canada and the Arctic. They hunt mainly herds of caribou. The
    timber wolf lives farther south in forests and mountains and woodlands."

27. T: Very good. Can anybody find another difference between these two wolves -
    the tundra and the timber wolf?

PAUSE.

28. S3: Yeah, they eat different things.

29. T: What kind of food do each wolf eat?

30. S5: All sorts.

31. S3: No, the tundra wolf eats her . . . "herds of car - cari- bou". And   the timber

wolf eats "big animals like deer, moose, elk, sheep and buffalo are their favourite foods".

32. T: Excellent. Well spotted.

PAUSE.

33. T: Any words that need to be clarified?

34. S6: What's that mean?

35. T: To clarify a word is to figure out what a difficult word means by reading the sentences around the word and then trying to figure out what that word might mean.

36. S6: Oh I remember now.

PAUSE.

37. T: Does anyone need a clarification?

38. ALL: No

39. T: I need to clarify a word. Can you help me figure out what 'vast' means?

PAUSE.

40. T: It would be helpful if we read the sentence in which the word is in. (Teacher points to where the sentence is, and students read the sentence in silence).

41. S6: It means no trees.

42. S4: Yeah, that's it.

43. T: Well, the word means really big, covers a wide area.

44. S6: Oh, now I see now.

PAUSE.

45. T: Any more clarifications needed?

SILENCE.

46. T: Well that was a fantastic group effort.

Example Of The RT Only Group In The Beginning Sessions:

WHAT'S UP PUSSYCAT?

The tiger of Asia is the largest - and fiercest - member of the cat family. It always hunts alone, either just before or just after sunset, and feeds mainly on antelope, deer, wild pigs and (sometimes) monkeys. But it will eat almost any meat. And do you realise what that means? Tigers should never be let lost amongst the other animals in

the zoo! Tigers like water and, in the tropical heat, swim for hours to keep cool.

1. T: S1, its your turn for the summary now please. Okay, are you ready?

2. S1: Yeah.

3. S2: Can I ask a question?

4. S3: No.

5. S1: "The tiger of Asia is the largest member of the cat family."(Reads from paper).

6. T: Right so is this summary all about the tiger from Asia? Is it about anything

    else?

7. S4: And what it eats.

8. S3: It eats er . . .

9. S1: Yeah.

10. S3: Pigs, sheep er . . .

11. T: Please do not all speak at once. If you speak over each other - it's difficult to

    hear what you're actually saying.

PAUSE.

12. T: So we have established that this paragraph is about the tiger from Asia. So

    (reads from paper): " The tiger of Asia is the largest - and fiercest - member of

    the cat family. " Notice that I read the first sentence of the paragraph, which

    summed up the main ideas.

PAUSE.

13. T: Any questions?

14. S5: Yes. Which of the cat family is fastest?

15. S1: Er . . . the leopard.

16. S4: No, the panther.

17. S1: Why shouldn't the tigers be loose at the er . . . jungle, I mean the zoo?

18. S2: They would kill everyone.

19. S5: They would eat the other animals.

20. S2: And they would sense the smell of other meat and so they would come and

    kill the other animals.

PAUSE.

21. T: I would like to ask a question. Its from the laminated card. Why is water

    important to the tiger from Asia?

22. S5: 'Cos they need it to drink.

23. S3: Cos its hot and the need to cool down, so they swim.

24. T: Wonderful answers. Yes, they live in a tropical climate which means its very hot and they need to cool down especially since they have a heavy coat of fur.

PAUSE.

25. T: Any words to clarify? A difficult word to figure out.

PAUSE.

26. S1: No.

PAUSE.

27. T: So there are no words to clarify?

28. S5: Where's the tiger from?

PAUSE.

28. S3: Malaya.

29. S2: Canada.

30. S1: Bingo.

31. T: That was a question. Remember that the tiger we're reading from comes from Asia.

PAUSE.

32. T: That was an interesting discussion. We're finished now.

Example of ET/RT In The Final Reciprocal Session:

POSSUMS

The smallest of the gliding possums, the Feather tail Glider is only 6.5 to 8 centimetres long, and has a particularly interesting tail. This tail is usually 7 or 8 centimetres long, and flattened, with a fringe of stiff hairs along each edge - just like a feather. The possum uses it to help it glide, steer, brake and anchor itself, and can easily travel 20 metres in one glide, slowing itself down, if it wants to, by fluttering its membrane and tail. Feather tail gliders also have large pads on their toes, and with these they can cling to the smoothest of surfaces - even glass window panes. They have been found nesting in hollow tree limbs, the nests of other animals, boxes on telephone poles, plastic bags and even, once, in an old coat hanging on a tree . . .

1. S1: I can do a summary. The summary is how fast he moves.

2. S2: (Whispers). About the possum.

3. S1: Yeah

4. T: Okay so we've established that this paragraph is about the possum. Do we know what sort of possum it is? Does the paragraph tell you anything about the possum? What are the main ideas written about the possum in this paragraph?

5. S4: Its er . . . about how it flies.

6. T: Very good.

7. S2: What its got on its feet.

8. T: Yes it does mention the pads on the possums feet.

9. S1: Its name is er . . . the "Feathertail possum".

10. T: Well done everyone. We have some important ideas here. We are talking about the Feathertail possum, secondly about its flying and thirdly its feet. Now we need to put these main ideas into a summary. Remember the summary can only be one or two sentences long.

PAUSE.

11. S3: The er . . . Feathertail possum can fly good with its tail and it has er . . . pads on its feet.

12. T: Fantastic summary! Anybody like to add to the summary, or have a different summary?

13. S1: Nah, sounds good.

PAUSE.

14. S4: What about questions now?

15. S1: Yeah, any questions?

16. S3: Why is the glider only 6cm long? (Reads from paper).

17. T: So S3 wants to know why the glider is so small.

18. S4: So it can er . . . camouflage itself in little areas and it would fit.

19. T: The Feathertail possum is so small, perhaps its because this type of possum only grows to around eight centimetres. That was a very good question.

20. S5: Why does it have pads on its feet?

21. T: An interesting question. Why does the Feathertail Possum have pads on its feet?

22. S4: So when its climbing it can grip on.

23. S6: Yeah, grip.

24. S5: But miss, its a hollow tree and its probably got holes all the way up.

25. T: Pardon? Oh, true there are hollow places on the tree, but the possum uses these for sleeping doesn't it?

26. S5: Why does the glider have er. . . hair along it?

27. T: Oh, why does the glider have hair along the edges of its tail?

PAUSE.

28. T: Why do you think its got hairs along each edge of its tail?

29. S5: Make it glide better.

30. T: Yes, to make the possum glide better, good. So the tail helps the possum glide, steer brake and anchor itself.

PAUSE.

31. T: Do you think we need to clarify any words? Are there any difficult words in the paragraph which you don't understand?

32. S6: I've got one, I've got one. Have they got a smooth surface?

33. T: Right, very good question, but remember its not a clarification. Clarification is where we figure out a difficult word by reading the sentence in which it is in and then trying to figure out what the word means. Let's answer your question. Have gliders smooth bodies?

34. S6: Yes, they have.

35. S3: No.

36. S6: Yes.

37. S1: Miss, miss, it's like a coat hanging on a tree.

38. T: Well, it's difficult to answer this question, as not enough information is given in the paragraph. We know that their tails are not smooth. (Reads from paper): "This tail . . . is flattened, with a fringe of stiff hairs along each edge - just like a feather." And if we look at the picture next to the third paragraph, we can see that the possum has a very furry coat, can't we?

39. S1: Yeah, now I can see.

40. T: I need a clarification on the word 'surface'.

41. S6: It means kind of, sort of, like hair.

42. T: Let's read the sentence in which the word is in. (Reads from paper):

"Feathertail Gliders also have large pads on their toes, and with these they can cling to the smoothest of surfaces - even glass window panes."

43. S5: Smooth.

44. S3: Nah, places different places.

45. S5: Yeah, like the coat hanger.

46. T: Well, that was a very good try. We are talking about what something looks like, feels like. So the possums can cling to rough surfaces (like the tree) and smooth surfaces (like glass).

PAUSE.

47. T: Would anyone else like to clarify a word?

48. S1: No, we're fine.

PAUSE.

49. S1: Er . . . any pred- predictions anyone?

50. S4: Yeah, possums again.

51. S6: Different sorts of possums.

52. S4: Where they live and things.

PAUSE.

53. S1: Yeah, well good work everyone.

Example of RT Only In Final Reciprocal Sessions:

REPTILES

Snakes are cold-blooded creatures which have to swallow their food whole and head first. All snakes are deaf: they have no ears but can detect the approach of man by feeling vibrations from the ground through their skin. Their sense of smell is good and is aided by their forked tongue picking up particles and applying them to a special spot (Jacobson's organ) in the roof of their mouth. Snakes have no eyelids, but each eye is protected by a scale which is renewed every time they moult. When they shed their skins the old scales which covered the eyes are lost with the old skin.

1. T: Summary, summary!!

2. S1: It's about snakes.

3. T: And what about them exactly?

4. S1: About their blood, and their skin.

5. S2: How long are they?

6. S3: What they look like.

7. T: So we're talking about snakes and what they look like.

8. S2: Yeah, how long are they?

9. S4: As long as -

10. S6: I've seen a bull dog snake.

11. S2: How does it close its eyes?

12. T: We need to pull our summary together first. Okay, we have established that the paragraph is about snakes, that they are cold blooded. Would anyone like to put this information into a summary?

13. S5: Yeah, it's about snakes that are cold-blooded and deaf. They also have no eyelids.

14. T: Well done. So we are discussing snakes and describing the five senses - touch, sight, smell, hearing and....

PAUSE.

15. T: Would anyone like to ask a question?

PAUSE.

16. T: Okay, I would like to ask one. Why is the 'Jacobson's organ" important?

17. S1: Where's that miss?

18. T: (reads from paper): Their sense of smell is good and is aided by their forked tongue picking up particles and applying them to a special spot (Jacobson's organ) in the roof of their mouth."

19. S4: It's where they can taste things.

20. T: Very good. Any other questions?

PAUSE.

21. T: Okay, can a snake hear you coming?

22. S5: Yes

23. S2: No, 'cos they've got no ears.

24. T: Well done. (Reads from paper): "All snakes are deaf: they have no ears but can detect the approach of man by feeling vibrations from the ground through their skin."

25. S1: Have snakes got eyelids?

26. S3: No, only sometimes.

27. S5: No, they never have eyelids.

28. T: It says in the paragraph that snakes have no eyelids. Where you might be getting confused is that each snake's eye is protected by a scale which is grown again every time they shed their skin.

29. S1: Can the snake chew food?

30. T: Good question.

31. S6: No, they haven't got teeth.

32. S3: They swallow.

33. T: Good. They snake swallows their food whole and head first.

34. S4: Oh, gross!

PAUSE.

35. S1: Any more questions?

PAUSE.

36. T: Any words to clarify -figure out that are difficult?

PAUSE.

37. T: I've got one. What does 'vibrations' mean? Its in the sentence "all snakes are deaf: they have no ears but can detect the approach of man by feeling vibrations from the ground through their skin."

38. S5: They feel things from the ground.

39. S1: Yeah, they know when someone's coming.

40. T: Good. They can feel the movements through the ground when someone is walking nearby.

PAUSE.

41. T: I've another difficult word that I need to figure out. What does 'particles' mean? (Reads from paper): "Their sense of smell is good and is aided by their forked tongue picking up particles and applying them to a special spot in the roof of their mouth."

42. S1: I don't know.

43. S6: I know, 'things'.

44. T: Excellent. Small bits from the ground. Any more clarifications?

PAUSE.

45. T: Does anyone want to give a prediction?

46. S1: We'll talk about how the snake kills its prey.

47. S5: Where it lives.

48. S2: How it makes babies. (giggles).

49. T: Very interesting predictions. I enjoyed reading about the snake, there was alot there that I wasn't aware of. Okay, good stuff.

APPENDIX 6.

Student Participation Assessment Questionnaire

The assessment forms are to be completed on each student prior to, and following, the study in which they are to be involved in. A tick is to be placed below one of the five categories deemed appropriate in your estimation following observation of the student within the classroom.

1. Tries to finish assignments even when they are difficult.

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

2. Adheres to classroom rules.

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

3. Raises hand to ask questions.

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

4. Doesn't need to be reprimanded on a regular basis.

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

5. Puts effort into completing familiar assignments.

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

6. Answers questions which are directed to him or her.

ALWAYS　　　USUALLY　　　SOMETIMES　　　USUALLY NOT　　　NEVER

-----------　　　-----------　　　-----------　　　-----------　　　-----------

7. Doesn't withdrawn when group time and class discussions are taking place (e.g. increased verbal and non-verbal communications).

ALWAYS　　　USUALLY　　　SOMETIMES　　　USUALLY NOT　　　NEVER

-----------　　　-----------　　　-----------　　　-----------　　　-----------

8. Follows directions given by teacher.

ALWAYS　　　USUALLY　　　SOMETIMES　　　USUALLY NOT　　　NEVER

-----------　　　-----------　　　-----------　　　-----------　　　-----------

9. Tries hard with new and unfamiliar assignments.

ALWAYS　　　USUALLY　　　SOMETIMES　　　USUALLY NOT　　　NEVER

-----------　　　-----------　　　-----------　　　-----------　　　-----------

10. Decreased disruptive behaviour (e.g. less interference with peers work; less irrelevant responses at group time or in class discussions).

ALWAYS　　　USUALLY　　　SOMETIMES　　　USUALLY NOT　　　NEVER

-----------　　　-----------　　　-----------　　　-----------　　　-----------

11. Does more than just the assigned work.

ALWAYS　　　USUALLY　　　SOMETIMES　　　USUALLY NOT　　　NEVER

-----------　　　-----------　　　-----------　　　-----------　　　-----------

12. Completes homework on time.

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

13.   Less restless behaviour is shown (e.g. doesn't find it difficult to settle down to a task; less fidgeting and chair rocking).

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

14. Goes to dictionary, encyclopaedia, or other reference on his or her own to seek information.

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

15. Engages in class discussions (e.g. by volunteering information).

ALWAYS   USUALLY   SOMETIMES   USUALLY NOT   NEVER

------------   ------------   ------------   ------------   ------------

SCORING:

ALWAYS: 5 USUALLY: 4 SOMETIMES: 3 USUALLY NOT: 2 NEVER: 1

APPENDIX 7.

Details of analysis of variance for significant effects on PEP tests

PEP2
by   GROUP
with PEP1

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Covariates	16775.169	1	16775.169	116.341	.000
PEP1	16775.169	1	16775.169	116.341	.000
Main Effects	9646.566	2	4823.283	33.451	.000
GROUP	9646.566	2	4823.283	33.451	.000
Explained	26421.735	3	8807.245	61.081	.000
Residual	8939.795	62	144.190		
Total	35361.530	65	544.024		

APPENDIX 8.

Multiple regression analysis of PEP pretest and posttest measures.

Equation Number 1   Dependent Variable..   PEP2

Block Number 1. Method: Enter   PEP1

Variable(s) Entered on Step Number 1..   PEP1

```
Multiple R            .68876
R Square              .47439
Adjusted R Square     .46618
Standard Error      17.04148
```

Analysis of Variance

```
                  DF      Sum of Squares      Mean Square
Regression         1         16775.16909      16775.16909
Residual          64         18586.36121        290.41189

F =      57.76337      Signif F =   .0000
```

------------------ Variables in the Equation ------------------

```
Variable            B         SE B       Beta        T  Sig T

PEP1          1.476626     .194287    .688760     7.600  .0000
(Constant)   10.882215    4.182000                2.602  .0115
```

End Block Number   1   All requested variables entered.

From Equation   1:   1 new variables have been created.

```
   Name       Contents
   ----       --------

   RES_1      Residual
```

RENAME VARIABLES (res_1=PEPGAIN).

APPENDIX 9.

One way analysis of variance - Tukey procedure.

```
    Variable  PEPGAIN    Residual
By Variable   GROUP
```

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	9408.7726	4704.3863	32.2935	.0000
Within Groups	63	9177.5886	145.6760		
Total	65	18586.3612			

```
    Variable  PEPGAIN    Residual
By Variable   GROUP
```

Multiple Range Tests: Tukey-HSD test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 8.5345 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 3.39

(*) Indicates significant differences which are shown in the lower triangle

```
                         C R
                         o T
                         n   E
                         t o T
                         r n /
                         o l R
                         l y T
    Mean         GROUP

 -15.1573      Control
   1.1345      RT only     *
  14.0228      ET/RT       *  *
```

APPENDIX 10.

Details of analysis of variance for significant differences between groups on day one

```
- - - - - O N E W A Y - - - - -
```

Variable   DAY1
By Variable   GROUP

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	11.0000	11.0000	.0304	.8625
Within Groups	42	15211.0000	362.1667		
Total	43	15222.0000			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for		Mean
Grp 1	22	27.5000	15.7926	3.3670	20.4980	TO	34.5020
Grp 2	22	26.5000	21.7929	4.6463	16.8376	TO	36.1624
Total	44	27.0000	18.8149	2.8365	21.2798	TO	32.7202

GROUP	MINIMUM	MAXIMUM
Grp 1	.0000	63.0000
Grp 2	.0000	82.0000
TOTAL	.0000	82.0000

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
.7599	1	42	.388

APPENDIX 11.

Multivariate analsis of variance for groups across time

```
-> MANOVA
->  week1 week2 week3 week4 BY group(1 2) WITH ( day1 )
->  /WSFACTORS time(4)
->  /CONTRAST (time)=Polynomial /CONTRAST (group)=Deviation
->  /CINTERVAL INDIVIDUAL(.95) UNIVARIATE
->  /METHOD UNIQUE
->  /ERROR WITHIN+RESIDUAL
->  /OMEANS TABLES(group )
->  /PMEANS TABLES(group )
->  /PRINT
->  SIGNIF( UNIV MULT AVERF )
->  PARAM( ESTIM ).
```

- -

A n a l y s i s   o f   V a r i a n c e

Tests of Between-Subjects Effects.

Tests of Significance for T1 using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN+RESIDUAL	18318.14	41	446.78		
REGRESSION	28387.90	1	28387.90	63.54	.000
GROUP	1729.34	1	1729.34	3.87	.056

- -

A n a l y s i s   o f   V a r i a n c e

Tests involving 'TIME' Within-Subject Effect.

Mauchly sphericity test, W =	.69098
Chi-square approx. =	15.05256 with 5 D. F.
Significance =	.010
Greenhouse-Geisser Epsilon =	.82377
Huynh-Feldt Epsilon =	.90008
Lower-bound Epsilon =	.33333

AVERAGED Tests of Significance that follow multivariate tests are equivalent to
univariate or split-plot or mixed-model approach to repeated measures.
Epsilons may be used to adjust d.f. for the AVERAGED results.

- -

Analysis of Variance -- design 1

EFFECT .. GROUP BY TIME
Multivariate Tests of Significance (S = 1, M = 1/2, N = 19)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.01727	.23434	3.00	40.00	.872
Hotellings	.01758	.23434	3.00	40.00	.872
Wilks	.98273	.23434	3.00	40.00	.872
Roys	.01727				

Note.. F statistics are exact.

- -

EFFECT .. GROUP BY TIME   (Cont.)
Univariate F-tests with (1,42) D. F.

Variable	Hypoth.SS	Error SS	Hypoth. MS	Error MS	F	Sig.of F
T2	16.91364	5243.16364	16.91364	124.83723	.13549	.715
T3	3.84091	2513.09091	3.84091	59.83550	.06419	.801
T4	21.01818	2229.06364	21.01818	53.07294	.39602	.533

- -

Analysis of Variance

EFFECT .. TIME
Multivariate Tests of Significance (S = 1, M = 1/2, N = 19)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.76689	43.86305	3.00	40.00	.000
Hotellings	3.28973	43.86305	3.00	40.00	.000
Wilks	.23311	43.86305	3.00	40.00	.000
Roys	.76689				

Note.. F statistics are exact.

- -

EFFECT .. TIME (Cont.)
Univariate F-tests with (1,42) D. F.

Variable	Hypoth.SS	Error SS	Hypoth. MS	Error MS	F	Sig.of F
T2	12813.8227	5243.16364	12813.8227	124.83723	102.64424	.000
T3	2550.56818	2513.09091	2550.56818	59.83550	42.62634	.000
T4	489.01818	2229.06364	489.01818	53.07294	9.21408	.004

- -

Analysis of Variance

Tests involving 'TIME' Within-Subject Effect.

AVERAGED Tests of Significance for WEEK using UNIQUE sums of
squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN+RESIDUAL	9985.32	126	79.25		
TIME	15853.41	3	5284.47	66.68	.000
GROUP BY TIME	41.77	3	13.92	.18	.913

APPENDIX 12.

Details of analysis of variance for significant effects on social studies test scores

-> ANOVA
-> VARIABLES=social
-> BY group(1 2)
-> WITH week4
-> /MAXORDERS ALL
-> /METHOD UNIQUE
-> /FORMAT LABELS .

```
* * *   A N A L Y S I S   O F   V A R I A N C E   * * *

             SOCIAL
      by     GROUP
      with   WEEK4

             UNIQUE sums of squares
             All effects entered simultaneously
```

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Covariates	17265.536	1	17265.536	699.675	.000
WEEK4	17265.536	1	17265.536	699.675	.000
Main Effects	256.431	1	256.431	10.392	.002
GROUP	256.431	1	256.431	10.392	.002
Explained	18685.990	2	9342.995	378.619	.000
Residual	1011.737	41	24.677		
Total	19697.727	43	458.087		

66 cases were processed.
22 cases (33.3 pct) were missing.

APPENDIX 13.

Multiple regression analysis of social studies pretest and

posttest measures

-> REGRESSION
-> /MISSING LISTWISE
-> /CRITERIA=PIN(.05) POUT(.10)
-> /NOORIGIN
-> /DEPENDENT social
-> /METHOD=ENTER week4
-> /SAVE RESID.


```
        * * * *   M U L T I P L E   R E G R E S S I O N   * * * *


Listwise Deletion of Missing Data

Equation Number 1    Dependent Variable..    SOCIAL

Block Number  1.  Method:  Enter      WEEK4


Variable(s) Entered on Step Number
    1..    WEEK4


Multiple R            .96727
R Square              .93562
Adjusted R Square     .93409
Standard Error       5.49495

Analysis of Variance
                  DF       Sum of Squares      Mean Square
Regression         1         18429.55935      18429.55935
Residual          42          1268.16793         30.19447

F =      610.36199      Signif F =  .0000


----------------- Variables in the Equation -----------------

Variable           B         SE B        Beta          T   Sig T

WEEK4          .980865     .039702     .967274     24.706   .0000
(Constant)   -3.809465    2.338853                 -1.629   .1108


End Block Number   1   All requested variables entered.


   * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

From Equation   1:   1 new variables have been created.

  Name   Contents
  ----   --------

  RES_1   Residual

-> RENAME VARIABLES (res_1=SSNRESID).
-> FORMATS SSNRESID (F7.2).

APPENDIX 14.

One way analysis of variance - Residual variable (ssnresid) by group

```
-> ONEWAY
->  ssnresid BY group(1 2)
->  /RANGES=TUKEY
->  /HARMONIC NONE
->  /STATISTICS HOMOGENEITY
->  /FORMAT NOLABELS
->  /MISSING ANALYSIS .
```

```
        - - - - - O N E W A Y - - - - -


        Variable   SSNRESID   Residual
     By Variable   GROUP


                        Analysis of Variance
```

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	249.7670	249.7670	10.3007	.0025
Within Groups	42	1018.4009	24.2476		
Total	43	1268.1679			

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
.0305	1	42	.862

APPENDIX 15.

Details of analysis of variance for motivation scales

```
MEANS
TABLES=extrin.1 introj.1 ident.1 intrin.1 index.1 extrin.2 introj.2
ident.2 intrin.2 index.2  BY group
CELLS MEAN STDDEV COUNT
FORMAT= LABELS
STATISTICS ANOVA .
```

- - Analysis of Variance - -

Dependent Variable EXTRIN.1
         By levels of GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	2.4920	.9595	19.3342	22
2	RT only	2.5795	1.0474	23.0383	22
3	Control	3.2455	.5673	6.7595	22
Within Groups Total		2.7723	.8831	49.1321	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	7.4706	2	3.7353	4.7896	.0116
Within Groups	49.1321	63	.7799		

Eta = .3633   Eta Squared =.1320

- - Analysis of Variance - -

Dependent Variable INTROJ.1
         By levels of GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	2.5918	.9041	17.1651	22
2	RT only	2.5318	1.0262	22.1169	22
3	Control	3.0986	.6284	8.2925	22
Within Groups Total		2.7408	.8690	47.5745	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	4.2661	2	2.1331	2.8247	.0669
Within Groups	47.5745	63	.7552		

Eta = .2869   Eta Squared =.0823

– – Analysis of Variance – –

Dependent Variable   IDENT.1
      By levels of   GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	2.9455	1.2428	32.4345	22
2	RT only	2.9795	1.1738	28.9333	22
3	Control	3.7000	.4175	3.6600	22
Within Groups Total		3.2083	1.0160	65.0278	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	7.9901	2	3.9950	3.8705	.0260
Within Groups	65.0278	63	1.0322		

Eta = .3308   Eta Squared =.1094

– – Analysis of Variance – –

Dependent Variable   INTRIN.1
      By levels of   GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	2.4023	16.8624	22	
2	RT only	2.2591	.9879	20.4932	22
3	Control	3.1045	.8616	15.5895	22
Within Groups Total		2.5886	.9167	52.9451	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	9.0089	2	4.5044	5.3599	.0071
Within Groups	52.9451	63	.8404		

Eta = .3813   Eta Squared =.1454

- - Analysis of Variance - -

Dependent Variable   INDEX.1
        By levels of   GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	.1741	1.6296	55.7653	22
2	RT only	-.1932	2.1733	99.1877	22
3	Control	.3195	1.7780	66.3881	22
	Within Groups Total	.1002	1.8744	221.3411	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	3.0722	2	1.5361	.4372	.6478
Within Groups	221.3411	63	3.5134		

Eta = .1170   Eta Squared =.0137

- - Analysis of Variance - -

Dependent Variable   EXTRIN.2
        By levels of   GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	2.5318	.7690	12.4177	22
2	RT only	2.8239	.8663	15.7593	22
3	Control	2.9159	.7041	10.4107	22
	Within Groups Total	2.7572	.7826	38.5878	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	1.7695	2	.8847	1.4444	.2436
Within Groups	38.5878	63	.6125		

Eta = .2094   Eta Squared =.0438

- - Analysis of Variance - -

Dependent Variable   INTROJ.2
     By levels of   GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	2.8709	.8147	13.9396	22
2	RT only	2.8282	.9210	17.8131	22
3	Control	3.0414	.5812	7.0949	22
Within Groups Total		2.9135	.7853	38.8476	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	.5597	2	.2799	.4539	.6372
Within Groups	38.8476	63	.6166		

Eta = .1192   Eta Squared =.0142

- - Analysis of Variance - -

Dependent Variable   IDENT.2
     By levels of   GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	3.3182	.8296	14.4527	22
2	RT only	3.2364	.9691	19.7209	22
3	Control	3.2091	.6871	9.9132	22
Within Groups Total		3.2545	.8365	44.0868	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	.1418	2	.0709	.1013	.9038
Within Groups	44.0868	63	.6998		

Eta = .0566   Eta Squared =.0032

- - Analysis of Variance - -

Dependent Variable   INTRIN.2
         By levels of   GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	2.3455	.9806	20.1945	22
2	RT only	2.5909	.9854	20.3932	22
3	Control	2.6545	1.0205	21.8695	22
Within Groups Total		2.5303	.9957	62.4573	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	1.1721	2	.5861	.5912	.5567
Within Groups	62.4573	63	.9914		

Eta = .1357   Eta Squared =.0184

- - Analysis of Variance - -

Dependent Variable   INDEX.2
         By levels of   GROUP

Value	Label	Mean	Std Dev	Sum of Sq	Cases
1	ET/RT	.0745	2.3450	115.4839	22
2	RT only	-.0577	2.2905	110.1768	22
3	Control	-1.1200	4.2542	380.0668	22
Within Groups Total		-.3677	3.1008	605.7275	66

Source	Sum of Squares	d.f.	Mean Square	F	Sig.
Between Groups	18.8676	2	9.4338	.9812	.3805
Within Groups	605.7275	63	9.6147		

Eta = .1738   Eta Squared =.0302

APPENDIX 16.

One way analysis of variance - Tukey procedure.

```
            - - - - -  O N E W A Y  - - - - -
   Variable   EFF1
By Variable   GROUP
                     Analysis of Variance

                            Sum of        Mean           F        F
            Source   D.F.   Squares      Squares       Ratio    Prob.

Between Groups        2    328.1212     164.0606      32.2628   .0000
Within Groups        63    320.3636       5.0851
Total                65    648.4848
```

```
   Variable   EFF1
By Variable   GROUP
```

Multiple Range Tests: Tukey-HSD test with significance level .050

The difference between two means is significant if
MEAN(J)-MEAN(I) >= 1.5945 * RANGE * SQRT(1/N(I) + 1/N(J))
with the following value(s) for RANGE: 3.39

(*) Indicates significant differences which are shown in the lower
triangle

```
                         R    C
                         T    o
                           E  n
                         o T  t
                         n /  r
                         1 R  o
                         y T  1
      Mean        GROUP

     14.1818     RT only
     14.3636     ET/RT
     19.0000     Control     *  *
```

```
-----------------------------------------------------------------------
   Variable   COMP1
By Variable   GROUP
                     Analysis of Variance


                            Sum of        Mean           F        F
            Source   D.F.   Squares      Squares       Ratio    Prob.

Between Groups        2    185.1818      92.5909      31.5000   .0000
Within Groups        63    185.1818       2.9394
Total                65    370.3636
```

```
        Variable  COMP1
     By Variable  GROUP

Multiple Range Tests:  Tukey-HSD test with significance level .050


                            R   C
                            T   o
                              E n
                            o T t
                            n / r
                            1 R o
                            y T l
        Mean       GROUP

        7.2273     RT only
        7.5000     ET/RT
       10.9091     Control    * *
```

```
        Variable  INIT1
     By Variable  GROUP
```

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	120.3636	60.1818	22.6233	.0000
Within Groups	63	167.5909	2.6602		
Total	65	287.9545			

```
        Variable  INIT1
     By Variable  GROUP

Multiple Range Tests:  Tukey-HSD test with significance level .050


                            R C
                            T o
                          E   n
                          T o t
                          / n r
                          R l o
                          T y l
        Mean       GROUP

        9.4091     ET/RT
        9.5000     RT only
       12.3182     Control    * *
```

```
        Variable   PART1
     By Variable   GROUP

                        Analysis of Variance


                              Sum of       Mean          F      F
    Source            D.F.    Squares     Squares      Ratio  Prob.

    Between Groups      2    128.8182     64.4091     16.1547  .0000
    Within Groups      63    251.1818      3.9870
    Total              65    380.0000




        Variable   PART1
     By Variable   GROUP

    Multiple Range Tests:   Tukey-HSD test with significance level .050


                              R   C
                              T   o
                               E  n
                              o T  t
                              n /  r
                              l R  o
                              y T  l

       Mean       GROUP

      10.7727     RT only
      11.2727     ET/RT
      13.9545     Control      * *

    ----------------------------------------------------------------------

        Variable   EFF2
     By Variable   GROUP

                        Analysis of Variance


                              Sum of       Mean          F      F
    Source            D.F.    Squares     Squares      Ratio  Prob.

    Between Groups      2     54.9091     27.4545      4.3084  .0176
    Within Groups      63    401.4545      6.3723
    Total              65    456.3636
```

```
        Variable  EFF2
     By Variable  GROUP

Multiple Range Tests:   Tukey-HSD test with significance level .050

                              R    C
                              T    o
                                E  n
                              o T  t
                              n /  r
                              1 R  o
                              y T  l
         Mean       GROUP


       17.2727     RT only
       19.0000     ET/RT
       19.3636     Control    *
```

```
        Variable  COMP2
     By Variable  GROUP
```

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	11.4848	5.7424	1.6547	.1994
Within Groups	63	218.6364	3.4704		
Total	65	230.1212			

```
        Variable  INIT2
     By Variable  GROUP
```

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	6.8182	3.4091	1.3074	.2778
Within Groups	63	164.2727	2.6075		
Total	65	171.0909			

```
        Variable  PART2
     By Variable  GROUP
```

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.3636	.1818	.0408	.9601
Within Groups	63	281.0909	4.4618		
Total	65	281.4545			