THE EFFECTIVENESS OF RECIPROCAL TEACHING APPLIED TO HUMAN SOCIETY AND ITS ENVIRONMENT: AN EXPLORATORY STUDY.

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The work contained in this thesis has not been submitted previously for a degree or diploma at any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

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ABSTRACT

This study examined the effectiveness of the Reciprocal Teaching (RT) reading comprehension activity applied to prepared readings in the subject Human Society and Its Environment (HSIE). Reciprocal teaching involves the four strategies of 'questioning', 'clarifying', 'summarising' and 'predicting', employed in a process that uses students in the role of tutors and cycles this role among all students of the group. RT is a social teaching strategy designed to produce metacognitive readers who are able to interrogate text for its meaning. This study was completed in two phases: the first of which was a triangulated mixed method approach involving Year 4 students and the second phase was a case study of the use of a modified RT approach with a Year 2 class. The Year 4 class was internally divided into two equivalent groups; the control group was taught by the class teacher in her traditional manner, and the experimental group was subjected to the RT process by the researcher. The quantitative data were analysed using both descriptive and inferential methods and the qualitative data studied for emerging themes related to possible internalisation of the skills involved in the use of RT. A pre-test/post-test method revealed that the experimental group suffered no disadvantage after exposure to the reciprocal teaching process. Further, there was evidence of internalisation of the RT strategies among the students of the experimental group. Later, a simplified version of the RT process (limited to use of the 'questioning' strategy) was applied to a Year 2 class as a case study. Again, there was evidence of internalisation of the strategy involved indicating that RT strategies may be taught early in the primary program. The study indicates that the strategies of RT can be applied in subjects other than English and in so doing students may develop generalised skills that will lead to critical thinking.

TABLE OF CONTENTS

Title page	i
Statement of original authorship	ii
Statement of copyright	ii
Acknowledgements	iii
Abstract	iv
Table of contents	v
List of figures	viii
List of tables	viii
List of appendices	viii

CHAPTER ONE

INTRODUCTION

Background	1
The purpose of the study	2
Significance of the study	3
Limitations of the study	3
Definition of terms	3
Summary of succeeding chapters	4

CHAPTER TWO

LITERATURE REVIEW

Introduction	5
Current demands of education	5
The reading process	6
Comprehension of text	9
The long term effects of poor reading comprehension	10
Critical thinking and literacy	11
Transferability of strategies and metacognition	13

The Reciprocal Teaching process 14
The four-strategy approach 15
Reciprocal Teaching: the original studies 18
Benefits of Reciprocal Teaching 20
Cautions in the application of Reciprocal Teaching 21
Alternate findings and criticisms of Reciprocal Teaching 23
Improving the Reciprocal Teaching process 24
Applying Reciprocal Teaching to other KLAs including HSIE 25
Concluding comments 26

CHAPTER THREE

RESEARCH METHOD

Introduction 27
The two-phased approach 27
Phase 1 research design 28
Chronological process 29
The teaching process 29
Phase 2 research design 30
Data analysis 30
Ethics 31

CHAPTER FOUR

ANALYSIS OF RESULTS

Introduction 32
Section I: establishing equivalency in Year 4 sex, age and ability 32
Description of participants 32
Section II: determination of Year 4 learning 37
The pre-test 37
The post-test 37
Section III: qualitative data - Year 4 assessment of reading skills acquired 41
Evidence to suggest internalisation of processes 41
Evidence that the ‘questioning’ strategy stimulates subject enquiry 42

Post-test interview 43
Section IV: qualitative data - Year 2 assessment of reading skills acquired 46
Qualitative evidence to suggest benefit of RT to Year 2 students 46
Using questioning to develop a list 47
'Questioning' to paraphrase text: two student examples 47
Study findings 48

CHAPTER FIVE

CONCLUSIONS

Discussion 49
Implications 51
Limitations 51
Recommendations for further research 52
Value of the study to the researcher 53

REFERENCES 54
APPENDICES

List of Figures

Figure

1	Pre-test/post-test means comparison	39

List of Tables

Table

1	Statistics cross-tabulation (group membership vs. sex)	33
2	Control and experimental groups by age in years and months	33
3	Statistics cross-tabulation (group membership vs. age)	34
4	Independent samples t-test (mean age comparison)	34
5	Control group and experimental group means	36
6	Ravens Progressive Matrices: independent samples t-test	36
7	Comparison of means between pre-test and post-test	38
8	Means pre-test	38
9	Means post-test	38
10	Two-way between groups ANOVA	40

List of Appendices

Appendix I Student participation permission letter

Appendix II Pre-test questions

Appendix III Post-test questions

Appendix IV Student interview permission letter

Appendix V Student journal questions

CHAPTER 1

INTRODUCTION

Background

An adequate education is needed in order that students will survive and prosper in current society. Life choices and career options can be determined by an individual's ability to gather and interpret information. A recent national inquiry found that success of the individual in society requires quality school teaching programs, developing literacy skills in all its students (Rowe, 2005). In later working life, an educated 'knowledge worker' (Drucker, 1967) requires a breadth of knowledge, a critical approach to discerning information, and the ability to self-monitor progress (Patrick, 1986). Teachers are advised that cognitive and metacognitive skills must be explicitly taught, so that individuals can extract and interpret the information they require from the text (Rowe, 2005). Research indicates that among students, poor readers evolve into poor thinkers, devoid of strategies to structure the writing assignments that contribute to academic success (Alfassi, 2004, p.1) and teachers who fail to model effective literacy strategies to their students, simply compound the problem (Stefani, 1998, p. 12).

The literature indicates that there is a means of teaching students sound literacy skills while developing their ability to think critically. This process involves training students to use the skills of Reciprocal Teaching (RT). RT is a reading comprehension activity well suited to students in primary education, who are grounded in concrete operations, and benefit from overt displays of communication within a social context. This activity comprises four interrelated strategies that

require the reader to actively interrogate the text, reflecting upon what they do and do not yet know. The teacher initially explicitly models the strategies, but later withdraws to monitor its practice as students mirror the process and discuss and compare their reading comprehension progress. Through this metacognitive approach, students take personal responsibility learning to extract meaning from print.

The purpose of the study

The purpose of this study was to determine if the Reciprocal Teaching reading comprehension activity could be used to enhance learning in another Key Learning Area (KLA) other than English, in both a Year 4 and Year 2 classroom. The Human Society and Its Environment (HSIE) KLA was chosen. The research attempted to answer the following three questions:

1. Can Reciprocal Teaching be applied to reading passages in subjects other than English without detriment to the learning that should take place in that subject (in this case, HSIE)?
2. Is there evidence to suggest that when the RT approach to reading comprehension is applied to reading passages in a subject other than English (in this case HSIE), students can give evidence of internalising the skills involved?
3. How early in the school life of a student, can the use of RT strategies be taught with reading passages in subjects other than English (in this case HSIE)?

Significance of the study

Because literacy skills form the basis of acquiring and sharing knowledge, it has become mandatory that literacy skills form part of all subjects taught in primary schools (Rowe, 2005). Reading comprehension concerns extracting meaning from text and is therefore a fundamental literacy skill. Reciprocal Teaching utilises a simple four-strategy approach to teach students to interrogate the text for meaning. If RT can be found to enrich other subjects, then it complies with curriculum requirements. Further, if RT processes aid the development of metacognitive skills, then it can be argued that RT can also aid the development of critical thinking in students.

Limitations of the study

This was a small experimental study involving two classes within a single primary school and bound by the constraints of teaching practicums. The research period was short in duration and the successful application of Reciprocal Teaching to other KLAs would require further testing.

Definition of terms

- KLA – Key Learning Area (subject of study within the curriculum).
- Control group – the group which undertook instruction via a traditional method.
- Experimental group – the group which undertook instruction via the Reciprocal Teaching reading comprehension activity.
- RT - Reciprocal Teaching: a four-strategy process for teaching reading comprehension: ‘questioning’, ‘clarifying’, ‘summarising’ and ‘predicting’.
- HSIE – Human Society and Its Environment

Summary of succeeding chapters

Chapter 2 examines recent literature concerned with the reading process, text comprehension, critical thinking, metacognitive processes, the RT reading comprehension activity and the original studies in RT. Chapter 3 outlines the research method employed in the study and defines the statistical processes used in data analysis. Chapter 4 describes the study participants and argues for equivalence between the control and experimental groups, and presents the analysis of data gathered from both Phase 1 and Phase 2 of the study. Chapter 5 provides a discussion of the findings in response to the research questions, and acknowledges the limitations of the study. The chapter concludes with final recommendations in relation to Reciprocal Teaching and its application to content-based KLAs.

CHAPTER 2

LITERATURE REVIEW

Introduction

This chapter presents a summary of current research into Reciprocal Teaching, and argues that reading comprehension is a critical aspect of literacy. It also argues that by nature of its structure, training in Reciprocal Teaching may well develop the metacognitive skills required for critical thinking

Current demands of education

Fundamental to the success of any economy are the skills and abilities of the people that contribute to it (Rowe, 2005). In a world powered by technology, knowledge has become an important commodity. Peter Drucker's concept of the 'knowledge worker' (Drucker, 1967) describes a major ingredient of economic success. The 'knowledge worker' employs high level cognition, adapting and applying literacy skills acquired through years of formal education, to seek out, organise and think critically in relation to the employment of information (Jensen, 1998, p. 9; Patrick, 1986). Thus, one of the major goals of education is to develop wide-ranging critical thinking skills among students of all ages (van Gelder, 2005, p. 41). The National Inquiry into the Teaching of Literacy (Rowe, 2005) revealed that the quality of teaching programs plays a vital role in educating the nation's students and preparing them to contribute directly to its wealth.

Within the field of educational research, cognitive psychologists have focussed on techniques to assist students in becoming more responsible for their own learning (Slater & Horstman, 2002, p. 164). Cognitive strategies help students become creative and discriminating thinkers and provide a purposeful focus in problem solving as they organise the material they need to learn or use (Slater & Horstman, 2002, p. 164). Often this material is of a textual nature and therefore involves reading.

Reading ability is vital to successful engagement with the knowledge-based economy and without effective reading skills the years of potential education are shortened (Alfassi, 2004, p. 171; Rowe, 2005). The National Inquiry into the Teaching of Literacy (Rowe, 2005) declared the education of young people to be the single most critical factor in determining the future prosperity of Australia. It recommended that teachers must provide direct and explicit literacy instruction for students of all abilities. Further, the report stated that the modes of literacy instruction should be supported by evidence-based practices. Effective reading comprehension is fundamental to ongoing academic success; all teachers must be reading teachers (Hashey & Connors, 2003, p. 224). This research project is a part of the development of such evidence-based practice.

The reading process

Successful reading requires automation of processes of deciphering print so that conscious thought can be applied to extracting meaning from text. Word decoding involves translating print into words. Canadian reading expert John Kirby explains the two instructional processes for teaching reading. Phonological decoding involves

using features to identify letters, which code increments of sounds that contribute to word construction; whereas the whole language approach attempts to teach the reader to recognise the whole word in context (Kirby, 1988, pp. 239-241). Both strategies are meant to lead to automatic visual decoding and deeper comprehension. The phonological approach provides explicit instruction in sound-symbol relationships, and the whole language approach employed in visual decoding exposes the reader to stimulating higher level print rich environments (Center, 2005, p. 8). Biggs and Moore (1993, p. 341) argue that both approaches are necessary, for if instant word recognition (characteristic of fluent readers) does not occur, students need to fall back upon the ability to break down words into letters and sounds. If neither skill is adequate, the reading process falters. Reading comprehension is a function of working memory, and begins at the word level: the crossover point between decoding and the development of ideas (Kirby, 1988, p. 236). It is apparent that without word level understanding, reading can proceed no further. Kirby (1988, p. 237) explains the two methods of understanding reading material using words. Word decoding using the phonological and visual approaches is known as ‘bottom up’ processing, where individual words are grouped into chunks then understood in larger ideas and themes. Comprehension processes in which words are employed to create ideas and themes involve the reader’s existing knowledge to create a context and therefore involves ‘top-down’ processing. This occurs when knowledge of main ideas and themes leads the reader to expect certain words or word types to appear, based on the inferred meaning of the text.

While word decoding is a requirement of reading, it alone is not sufficient. ‘Barking at print’ occurs when the reader’s eyes have scanned and decoded the text but the

mind has not been able to develop adequate ideas and themes from them. Evaluating the relevance of text chunks while reading is important, because students need to work at the higher levels of ideas, main ideas and themes to attain complete reading comprehension (Biggs & Moore, 1993, p. 342).

Kirby (1988, p. 237) explains that efficient reading does not require conscious effort in word decoding. Instead, working memory is free to focus on making sense of the ideas expressed in the text. Unlike beginning readers, skilled readers see words and the chunks of information they represent not as isolated entities, but as interconnected ideas that convey holistic meaning. The immediate and unconscious recognition of commonly used words (skilled text decoding) is at the centre of fluent reading. Kirby (1988, p. 342) provides this analysis of textual meaning: readers who focus only at the word and sentence level accomplish only shallow, incomplete understanding. They are simply 'barking at print'. Readers who focus on understanding and relating ideas, main ideas and themes learn of the writer's overall purpose and are aware of the dominant themes that permeate the work. Central ideas and themes in text are revealed from the 'top-down', and for understanding to occur, the reader must read with clear purpose and intent (Biggs & Moore, 1993, p. 342).

Results from multiple studies reveal that reading comprehension markedly improves when taught with a metacognitive approach. It is the awareness and employment of self monitoring strategies (which approach sufficient maturity by Year 6) that enable students to achieve the real purpose of reading: extracting the fullest meaning from text (Biggs & Moore, 1993, p. 343). Clearly, in addition to decoding skills

instruction, the teaching of comprehension skills must form part of the literacy program.

Comprehension of text

Comprehension begins where decoding ends: at the word level. Four decades ago, reading comprehension theory assumed that simply training students in phonological skills mastery would aid success in comprehending text. Comprehension skills included locating the main idea of the text, identifying the event sequence and using context clues to ensure students extract meaning from print (Palincsar & Brown, 1986, p. 776). Toward the end of the 1970s it was realized that students could be proficient in the use of decoding skills, and still fail to comprehend text. Reading comprehension researchers Palincsar and Brown (1986, p. 777) discovered that many students lacked techniques to both foster and monitor their own comprehension levels. A modelled interplay between teacher and students (that trained the learners to eventually assume full responsibility for their reading comprehension process) was missing. The main flaw with the early skills training approach was that it lacked a mechanism for bringing about lasting and successful change in reading habits. Reading effectiveness improvement requires deliberate and purposeful cognitive strategy instruction, to ensure that students learn what type of questions will result in clarifying relevant information (Slater & Horstman, 2002, p. 163). Comprehension of difficult texts poses many problems for the poor reader. At the secondary school level, at-risk readers have only a limited number of strategies at their disposal and struggle with a corresponding lack of flexibility and sensitivity in applying them. This is often compounded by an inability to develop ideas and purposes, and to

accommodate the varying reading demands of different text types (Hart & Speece, 1998, p. 670 citing Policastro, 1993).

Good readers believe that hints offered by the author at the beginning of a story will be relevant in later reading, and so question character motives, searching for evidence to support assumptions they have made (Ems, 1988, p. 103). Good readers are able to update ideas, main ideas and themes as they process new information from the text. Additionally, confident readers know that text meaning can be ambiguous, so they reread to clarify, and gain an understanding of the writer's intention. The use of complex strategies permits deep critical and conceptual processing of high level information. Such an approach should be within the grasp of novice readers (Slater & Horstman, 2002, p. 163). The aim of remediation should be to produce readers equipped with strategies to interact with text and self-monitor their own comprehension level. Further, readers must be able to identify and evaluate the writer's central ideas and organise the information in a meaningful manner (Hart & Speece, 1998, p. 671). Good readers read with purpose, and can discern between what information is relevant to their task and what is not. Students who view themselves as learners engage in 'intentional learning' where the intent is to assemble new knowledge and monitor their understanding of it (Biggs & Moore, 1993, p. 309). Such students employ metacognitive practices with clear intent of the desired outcome.

The long term effects of poor reading comprehension

Poor student reading skills in the early years restricts critical thinking skills in secondary schooling. Research by Alfassi (2004, p.171) indicates that mastering the

higher order thinking skills required for reading comprehension is still not being attained by mainstream students. Reading in the higher grades requires a critical approach, including the ability to evaluate the content and apply it to different situations (Alfassi, 2204, p. 171). Under-prepared tertiary education students have posed a significant literacy problem to United States universities for almost one hundred years, and almost a third of new students have required assistance with reading (Hart & Speece, 1998, p. 670). Poor readers have unrewarding early reading experiences caused by inadequate decoding skills, and minimal practice with content of little personal interest. In addition, poor readers can display traits of learned helplessness and frustration, compounded by a low self-concept of their own abilities; they simply fail to actively engage in reading exercises (Johnston & Winograd, 1985 as cited in Le Fevre, Moore, & Wilkinson, 2003, p. 38). Poor readers are simply unaware of the thinking skills involved in asking questions of the text (Ems, 1988, p. 104). Ineffective readers do not monitor their reading progress and fail to take corrective action when comprehension fails (Hart & Speece, 1998, p. 670). Little and Richards (2000, p. 190) found that unskilled readers often fail to employ reflective strategies. Their study showed that some sixth grade students could not comprehend year level texts, and lacked a purposeful self monitoring approach that occurred naturally within skilled readers.

Critical thinking and literacy

If text cannot be understood, how can its content be critically appraised? One way of promoting early development of reading comprehension and critical thinking skills is to teach primary aged students a metacognitive approach to reading. Metacognition combines the three components of reading: a general knowledge of the reading

process; awareness of personal strengths and weaknesses; and knowledge of the purpose for which the reading is being undertaken (Kirby, 1988, p. 257).

A general knowledge of the reading process acknowledges that reading is facilitated by the ability to focus attention both on the reading process and the information coded within the text. Attention is more effective if the environment is free of distractions. Attention requires effort, and wavers with time. Attention is greater if the interest level of the material being read is high. Comprehension is heightened if the material being read is familiar. Memory of the material is greater if a record is kept. Self-knowledge involving an awareness of one's own strengths and weaknesses allows for planning that maximises strengths and minimises weaknesses. Such knowledge includes an awareness of personal attention span, of proclivities for specific topics of interest, and a particular style for recording information that enhances recall. Finally, Kirby (1988, p. 257) argues that an essential characteristic of critical reading strategy is the ability to select those ideas encoded in the text that are relevant to the reader's purpose. Metacognitive knowledge about reading powers this process, as students search the text disregarding information that is not relevant to their enquiry. Teachers can aid this process by declaring the purpose of the reading activity. To summarise, Barry and King (2004, p. 616) suggest that metacognition applied to reading means students must learn how to approach learning, engaging in actions and thoughts that influence motivation, encoding, retention of information and the transfer of knowledge to other topic areas.

How does critical thinking benefit learning? For decades, educators complained about the lack of problem solving strategies being taught in schools, and Carr (1990)

explains that memorisation of facts, drill and homework activities, though important, are not alone sufficient. Creative and flexible application of new-found knowledge is a skill mastered by proficient readers (Brown & Palincsar, 1985, p. 8). Carr (1990) concludes that critical reading requires assessing information, drawing inferences from the text and arriving at evidence based conclusions that are consistent with the reader's purpose. These are the same skills required for critical thinking, as critical thinking involves analysis of differing ideas, organisation of thought and formation of valued judgements (Carr, 1990; Brown & Palincsar, 1985, p. 9). Critical thought is stimulated and text comprehension enhanced, when students generate their own questions (Little & Richards, 2000, p. 192).

Transferability of strategies and metacognition

A conscious awareness of learning strategies increases the extent of their use. The work of Schunk and Zimmerman (1998) reveals that students who have awareness of, and control over mental processes enabling them to acquire, encode and retain information are more likely to transfer these skills to other subject areas. Thoughts about the content itself combined with a strategy to actively learn and monitor learning progress are central to a metacognitive approach (Barry & King, 2004, p. 616). Le Fevre, Moore and Wilkinson (2003, p. 55) concurred with this finding, stating that students with adequate decoding skills can generalise their cognitive and metacognitive strategies to other classrooms and settings; yet poor decoders, cannot. Barry and King (2004, p. 617) also argue that students with the ability to actively control their learning processes can improve their learning capacity and influence development of higher order reasoning skills. To summarise, a student's progress is influenced by how well they master 'learning to learn'.

Within metacognition ‘strategy knowledge’ involves knowing which strategies to use, and when to use them, to achieve the desired outcome (Krause, Bochner & Duchesne, 2003, p. 146). Students must know how to adjust their reading comprehension monitoring skills to the level of text difficulty (Laverpool, 2008, p. 31). The ability to identify key ideas, locate specific details and draw inferences from text benefits students of all ability levels when employing the metacognitive strategy of rereading (Laverpool, 2008, p. 32).

Center (2005, p. 123) suggests that metacognitive strategies which monitor for meaning in text, and the use of ‘fix up strategies’ to correct reading errors should be introduced in Year 1, so that students are trained to actively monitor their learning from the earliest age. By Year 2, the focus of reading comprehension strategies can shift to student self-monitoring (Center, 2005, p. 205). To ensure maximum understanding of the printed word, students need explicit training in assuming ownership of the self-monitoring process (Carter, 1997, p. 65).

The Reciprocal Teaching process

Reciprocal Teaching (RT) is a strategy for teaching students to become metacognitive readers. Palincsar and Brown, (1986, p. 772) the originators of this reading comprehension activity, explain that it involves teacher-modelling of four comprehension fostering and comprehension monitoring strategies in an interactive and social small group setting. These strategies are: ‘questioning’, ‘clarifying’, ‘summarising’ and ‘predicting’. Students are required to eventually internalise and use these strategies autonomously each time they read.

A primary aim of Reciprocal Teaching is to persuade students to become self-reliant, independent readers who actively adopt the strategies to create their own understanding of the text (Slater & Horstman, 2002, p. 165). Based on a comprehensive review of educational literature and researched theoretical perspectives, Palincsar and Brown (1984, p. 120) concluded that successful reading comprehension was comprised of six key points:

- understanding both explicit and implicit meanings;
- activating background knowledge;
- focusing on prime content and excluding trivia;
- critical evaluation of content for internal consistency and comparison with existing knowledge;
- using periodic review to determine ongoing monitoring of comprehension; and
- drawing inferences to test predications, interpretations of information and conclusions.

The four-strategy approach

Palincsar and Brown (1984) embedded these six points into a reading comprehension activity involving the following four strategies:

- When ‘questioning’ the text, students concentrate on the main ideas and check their immediate level of understanding. Text is read and questions are posed about the content and additional questions are raised by the group.
- When ‘clarifying’ the text, students critically evaluate ideas, main ideas and themes whilst reading, seeking understanding of new or unfamiliar words and phrases.

- When ‘summarising’ the text, students allocate their attention to the major content of the text to ensure they have fully understood it. The leader paraphrases the text and asks for elaborations or revisions.
- When ‘predicting’ future content, students draw and test inferences from the text immediately read, and make predictions about the upcoming content.

In commenting on Palincsar and Brown’s research findings, Moore (1988, p. 7) noted the uniquely overt social nature of Reciprocal Teaching in which teachers (the experts) model the instructor/coordinator’s role to small teams of ‘novices’ (team members). The novices each take turn to assume the role of instructor/coordinator. Over time, the novices take increasing responsibility for making the system run. The teacher closely monitors this process, correcting and working to extend student current understandings. The public nature of the group interaction and the need to be able to act as tutor requires each student to internalise the four strategies.

Once modelled, this critical approach allows the teacher to remove themselves from the process and become available to prompt groups requiring direction, rather than being restricted to the task of individual student attention (Palincsar, 1986, p. 774). The routines of Reciprocal Teaching force overt student responses allowing for progressive teacher diagnosis. Palincsar and Brown (1984, p. 169) attribute the success of their approach to the continually challenging level of difficulty provided by the teacher who scaffolds student learning with ongoing assessment of reading comprehension, and is jointly responsible for student success. As the modelled skills were increasingly internalised by the student, as evident through constant feedback, the teacher can move into the role of facilitator. As each group became more

confident, the teacher could eventually withdraw from the process altogether, and act as overseer.

The distinctive role of ‘student-as-teacher’ in a structured group context identifies Reciprocal Teaching as uniquely different from most classroom reading approaches (Moore, 1988, p. 4). Reciprocal Teaching blends together both peer tutoring and teacher-student dialogue to deliver a deliberate metacognitive reading strategy (Moore, 1988, p. 4). Utilising students as teachers in this guided reading strategy, Reciprocal Teaching requires students to work cooperatively in a small group, each responding to the interactions of the other, as they comprehend and monitor their understanding of the text. The classroom teacher both models and initiates the process, being available to extend existing student knowledge (Brown, 1986, p. 401).

Reciprocal Teaching functions as an effective reading comprehension tool, partly because it operates within Vygotsky’s ‘Zone of Proximal Development’ (ZPD) where teachers: initially model the skills that students eventually master and employ with the group and on their own, and scaffold student efforts where needed. Reading students need to be prepared to risk making errors with peers, as discussion and meaning making occur within the structure of a supportive group environment (Ems, 1988, p. 105). As the techniques used to both foster and monitor comprehension occur within the mind of the fluent reader, they are unseen by others (Brown, 1986, p. 417). Reciprocal Teaching reveals the strategies openly so others can learn them. In quoting Vygotsky (1978), Brown (1986, p. 409) explains that Reciprocal Teaching works to bridge the gap between currently unassisted student problem solving capability and the level of achievement attainable with teacher or capable

peer support. Brown further explains that through the course of classroom discussion, two important events occur: teachers can assess the students' ZPD and the work required to achieve the desired comprehension level. Additionally, through the new group socialisations and because of their role as tutor, students eventually internalise the new-found skills that become part of their independent learning.

Reciprocal teaching was devised as a two-pronged strategy toward gaining meaning from print. In addition to fostering comprehension, Palincsar and Brown (1984, p. 120) explain how reciprocal teaching contains the embedded self-check function, to monitor whether comprehension is occurring. Self-questioning and summarising are proof of ability to locate and retain information relative to the purpose for which the text is being read, enabling the creation of a credible synopsis (Palincsar & Brown, 1984, p. 121). Rereading of the text to scan purposefully for information is a metacognitive tactic employed when applying the reciprocal teaching strategy of 'clarifying' (Palincsar & Brown, 1984, p. 122). It is a 'fix-up strategy' employed when the student fails to produce an adequate text summary.

Reciprocal Teaching: the original studies

Reciprocal Teaching emerged in the 1980s following widespread dissatisfaction with inadequate reading comprehension strategies. In this new model, collaboration with students replaced the pre-existing style of teacher presentation of skills with the aim of producing skilled readers who took responsibility for their own learning (Coley, DePinto, Craig & Gardner, 1993, p. 255). The goal of Palincsar and Brown was to offer reciprocal teaching to assist students in greater academic success by providing a clear and replicable model of teaching reading comprehension skills at a class

level, personally adopted at the individual level, to be embraced in future use (Brown & Palincsar, 1985).

Palincsar and Brown (1983) engaged poor student readers from Year 7 to three different study settings involving both control and experimental groups. Students took turns with teachers in leading dialogue and focusing on pertinent text features. In employing the four strategies to both foster and monitor comprehension, all three studies produced interesting findings. The first enquiry delivered greater initial and maintainable reading comprehension gains over time when compared to a traditional teaching method. The second study produced similar results on laboratory tests, as did the third study involving classroom teachers who had adopted the approach from the researchers, and utilised it in their own reading groups (1983, p. 1). The third study indicated the success of the approach, independent of the persons facilitating it. Tested under a variety of conditions, reciprocal teaching consistently delivered reading comprehension improvements. The participants were actively involved in a metacognitive and facilitative type approach.

Palincsar and Brown (1986, p. 776) found that Reciprocal Teaching improved comprehension even for those who were initially non-readers. The researchers described working with heterogeneous groups composed of six first grade students. The procedure was modelled aloud with students engaged in discussion, initiated by the more capable children. By the end of the study, students had begun to internalise the four strategies which were assessed orally. An adapted version of RT was found useful with younger children; a finding confirmed by Myers' later study in 2005.

Benefits of Reciprocal Teaching

A number of researchers and commentators argue that the cognitive basis of Reciprocal Teaching equips a learner for reading independence. Hart and Speece (1998, p. 671) argue that RT is superior to mere skills training. Although a wide range of instructional skills exist for teaching reading comprehension, the four strategies that comprise Reciprocal Teaching best address the deficiencies of poor readers (Hart & Speece, 1998, p. 671). Because of its structured and interactive approach, reciprocal teaching has been found to enrich both class and literature club discussions (Hashey & Connors, 2003, p. 232).

Proficient use of the 'questioning' strategy yields significant reading comprehension gains. In citing Roser and Keehn's (2002) findings, Chick (2006, p. 152) explains how the questioning strategy facilitated marked improvements in the Social Studies context. Questioning could be used to reduce misconceptions by half, aid analysis of individual opinions and facilitate debate. This led to substantial increase in factual knowledge, spurning students' motivation to learn. The Roser and Keehn research concluded that Social Studies students who collaborated in questioning, exploring viewpoints, and making decisions to reach a final consensus were comprehending and enthusiastic learners.

Reciprocal Teaching can also benefit older learners. The multi-teacher environment of secondary schooling requires more student self-reliance; no single teacher is solely responsible for a student's learning. Noting a deficit in cognitive reading strategies employed by secondary school students, Slater and Horstman (2002, p. 164) praised RT as a vehicle for developing deeper conceptual processing of ideas,

well suited to abstract thinking. RT was recommended to both middle primary and high school teachers to assist their struggling readers and writers.

Latest research indicates reciprocal teaching also benefits learning disabled (LD) children. As part of the inclusive classroom setting, these students are not excluded from the reciprocal teaching process. In citing a group of twenty-nine studies Gajria, Jitendra, Sood, and Sacks (2007, p. 210) found that students with learning disabilities (though fluent in text decoding) tended to be passive readers who did not automatically engage with the text at a deep level. They were unable to relate new information to prior knowledge and exhibited no self-monitoring skills for reading. Yet when exposed to RT, notable improvements in reading comprehension were recorded. Speece, MacDonald, Kilsheimer and Krist (1997, p. 183) reported that students with LD who exhibited behavioural, socialisation and emotional limitations were still capable of using RT to improve their reading comprehension. Most children found the 'prediction' strategy the easiest to master, achieving independent use of all four strategies by the end of the tenth week of instruction.

Finally, RT has an added financial incentive. The activity is taught by the classroom teacher and requires no additional materials or texts for implementation (Ems, 1988, p. 105).

Cautions in the application of Reciprocal Teaching

Students must attain the role of active leadership in the learning process to experience the greatest gains, with the teacher ultimately removed, simply guiding and facilitating the process. Otherwise skills mastery may not be achieved and the

integrated learning that occurs through modelling in the social context may not be internalised (Slater & Horstman, 2002, p. 165).

Teachers must not overuse literal questions. Thought provoking questions concerning the author's purpose and intent are more effective in facilitating text comprehension. While literal questions address content that is immediately apparent, the teacher must also encourage exploratory thought to establish that comprehension monitoring is occurring. This can be facilitated through use of the 'clarifying' technique, where answers are sought as to how and why an event occurs. 'Clarifying' aids the establishment of main ideas and the theme of the passage, and assists in drawing appropriate conclusions from the evidence (Slater & Horstman, 2002, p. 166). However in practice, teachers have been found to focus on deficits in background literal knowledge (unknown or new terminology) and overlook the elements of text and passages containing metaphors, symbolism and abstract ideas: the properties of figurative speech (Coley, DePinto, Craig and Gardner, 1993, p. 261).

Struggling readers and writers require teachers skilled in facilitating the RT activity. Learners require explicit teacher-modelling, confidently displayed. Extended pauses can occur if the teacher is unsure of when to re-enter the discussion that follows a question posed, or a query raised. This can result in students becoming reluctant to participate in the process. Teachers must develop student skill and confidence in using RT, before withdrawing from the process as leader (Slater & Horstman, 2002, p. 166).

Because Reciprocal Teaching involves the effective use of four specific strategies, explicit teaching to students prior to the use of each strategy gives better results. According to a 1993 review of nineteen experimental studies into the effectiveness of reciprocal teaching, Rosenshine and Meister (1993, p. 5) cite Palincsar's 1987 study which featured five days of teacher-modelling followed by both guided and independent student practice of the four techniques, before reciprocal teaching dialogues began. Strategy and vocabulary introduction (not the intention of mastery) enabled teachers to provide prompts, suggestions, hints, explanations, feedback, and corrections during discussions so that students could be eased into the new thinking processes. Thus, gains in reading comprehension proficiency were generally more significant when students were trained in the use of the new approach for a period of time, prior to implementation (Rosenshine & Meister, 1993, p. 2).

Alternate findings and criticisms of Reciprocal Teaching

Ironside (2003, p. 1) dismisses RT as merely a modernised version of the "SQ3R" study method (survey, question, read, recite, and review) espoused in the 1940s. SQ3R was adopted by tertiary level students, disciplined in the habit of private study. While similarities exist between the SQ3R method and RT, it can be argued that RT differs in one critical aspect. Reciprocal Teaching was not intended to be executed covertly by the individual, alone. The implementation of RT requires mental connections being developed by referencing back and forth between the steps, in a cooperative group atmosphere. This is an age appropriate social context for primary children who are fixed in concrete operations, yet to develop the metacognitive skills of self-monitored learning. The public nature of overt, observable tutoring behaviour that is rule-based, makes the process concrete in

nature, and marks a major difference with the SQ3R method which is largely covert in implementation. Students monitoring the development of each other are all actively involved in critical evaluation of text and making meaning from the exercise. Citing the reciprocal teaching approach outlined by Palincsar and Brown in 1984, Hashey and Connors (2003, p. 224) argue there is no passivity or inactivity. Students have to internalise the skills in order to teach and monitor each other. However time and practice are both necessary for internalisation to occur.

Improving the reciprocal teaching process

Reciprocal Teaching is best introduced around Year 3 (Hashey & Connors, 2003, p. 230) and extended to Year 8 if students have not completely mastered the process. Yet even 'kindergarteners' can be taught to begin to take responsibility for their own learning and lead discussion with classmates. Adopting a tailored technique known as "interactive read-alouds", all students can be engaged as a class in reading the text orally as led by the teacher (Myers, 2005, p. 316). In this manner, the researcher could assist the developing minds with recounting the sequence of story events.

Struggling text decoders learn more when listening as they read. Although initially intended for students skilled in decoding text, the Le Fevre team discovered that 'cognitive bootstrapping' particularly benefited struggling decoders. This approach required readers to listen to a text being read as they followed the printed word (also known as 'reading while listening' or using 'talking books'). This process enabled better understanding of context, as learners used both sight and hearing to absorb information, and develop anticipation for what the text may say next. They were not hampered by the slow word decoding experienced with unassisted reading. Citing

earlier research by Clay, 1993, the Le Fevre team (2003, p. 39) explain that a 'tape assisted' approach to reciprocal teaching proved successful with low interest, minimal strategy readers. In Clay's results, both researcher-developed and standardised tests indicated improved comprehension scores for both good and poor decoders. The rate of reading failure was minimised (Le Fevre et al, 2003, p. 37). Improving on initial practice, the Le Fevre team argued that tape assisted reciprocal teaching improved reading comprehension for less able decoders. The students learned to read with aural support.

Applying Reciprocal Teaching to other KLAs including HSIE

Hashey and Connors (2003, p. 225) also argue that reciprocal teaching can be considered as *supporting* curriculum implementation, not as an onerous addition to an already crowded program. Unlike primary classes, secondary school teachers do no have the advantage of the continuous daily interaction with students that provides opportunities to develop reading expertise throughout all KLAs in the weekly timetable. Primary teachers possess a unique opportunity to encourage generalisation of skills use across all subject areas. Where metacognition concerns thinking in order to learn, Patrick (1986) states that critical thinking requires reflective and rational thought about what to believe or do. In the HSIE context, Patrick argues that good citizenship, cultural respect and responsible use of the environment and its resources are key topics of the social studies, and that giving explicit instruction of effective thinking strategies is a teacher's responsibility to their students.

Reading comprehension in the English KLA was the original focus of Reciprocal Teaching, yet Palincsar and Brown (1986, p. 775) briefly measured the

generalisation of skills to the science and social studies disciplines, noting some improvement. Except for the Social Studies research of learning disabled students by Lederer (2000), and the recent 2007 work with learning disabled students by Gajria et al. (2007), the bulk of exploration into the effectiveness of reciprocal teaching has been confined to the English KLA. As reciprocal teaching is well suited to primary aged students, needing to extract a richer and more complete meaning from text (Hashey & Connors, 2003, p. 230), it is proposed that benefits to student learning across other KLAs could occur when such metacognitive practices are employed. Moore (1988, p. 13) commends evaluation of the RT approach in other reading contexts, suggesting that able students lacking the metacognitive tools for private study may under-perform at secondary level. Successful secondary schools have been found to employ their reflective strategies over the whole curriculum, rather than in subject isolation (Alfassi, 2004, p. 172).

Concluding comments

The ability to read and comprehend text is prerequisite to academic and vocational success (Rowe, 2005) and cooperative learning environments provide a social arena for discussion of ideas, analysis and problem solving (Brown, 1986, p. 397). Research indicates that critical thinking skills must be practiced deliberately to achieve mastery and transferability to other situations (van Gelder, 2005, p. 43) and the lack of conclusive findings concerning reciprocal teaching applied to other KLAs in primary schooling is the reason for this study. This study examines the effectiveness of RT when applied to a subject other than English.

CHAPTER 3

RESEARCH METHOD

Introduction

This chapter describes both the research methods and data collection procedures used in this study and provides the analysis of results. The chapter reviews the ethical issues involved in this study and concludes by describing the procedures needed for obtaining clearance from the Avondale College Human Research Ethics Committee (HREC).

The two-phased approach

The research was divided into two phases, over two practicum periods separated by five months. In Phase 1, an array of textual material was prepared in relation to the chosen topic for the Year 4 class assigned to the researcher for the first practicum session. The class was divided into a control group and an experimental group to compare the effects of using Reciprocal Teaching (RT) in handling the readings created for the unit, to that of more traditional methods. Pre-testing and post-testing generated quantitative data. In addition, qualitative data arose from student journals and student interviews.

Phase 2 of the research involved a case study of the use of RT with the Year 2 class assigned to the researcher during the second and later practicum. Data collected in this practicum were entirely qualitative.

Phase 1 research design

This aspect of the study was of a triangulated mixed method design where both quantitative and qualitative data were simultaneously collected.

The quantitative data arose from the 'quasi-experimental' approach in which the Year 4 class was divided into two groups balanced for sex, age and ability. Initially, the Ravens Progressive Matrices test (a test of working memory) was administered to inform the division of students into two comparable groups. However, the class teacher employed her prerogative to choose the two groups based on social interactions between students and ease of management. A series of readings was prepared for the HSIE topic to be taught and the class teacher taught the topic and employed the readings with the control group in her traditional manner. The researcher taught the same topic to the experimental group where he used RT procedures in handling the same set of readings. Members of both the control and experimental groups were pre-tested and post-tested for information contained in the readings (see Appendix II and Appendix III for the tests). The objective here was to compare the learning that took place in the experimental group with that of the control group.

The qualitative data were generated from student interviews and individual journal entries. Representatives of both the control group and the experimental group were interviewed. Questions were neutral and designed to avoid leading the participants. Students kept journal notes of their respective experiences based on set questions and a free response section (see Appendix V).

None of the students had experience with the topic or readings prior to the intervention; neither had any of them had experience with the methods of RT. Further, according to the knowledge of the class teacher, students of varying academic ability were evenly distributed among both groups to ensure heterogeneous grouping. Thus the study complies with Cresswell's (2005, pp. 297-298) requirements for a quasi-experimental approach.

Chronological process

In Week 1, the Ravens Matrices test was conducted on a whole class basis and students completed the pre-test. From the beginning of Week 2, the class was divided into the two groups. The research testing was conducted between Weeks 2 and Week 4. The post-test was held in Week 4, followed immediately by post-test interviews.

The teaching process

Phase 1: In agreement with the classroom teacher, a HSIE unit of four weeks' duration was taught. The experimental group was taught separately by the researcher in the reading withdrawal room. Reciprocal Teaching procedures were employed with prepared reading passages. Students had received no prior exposure to this approach. Due to time constraints, the experimental group received initial exposure to the four RT strategies during the first HSIE lesson. Application of the strategies was modelled, practised and refined over following sessions. The classroom teacher taught the control group using her standard HSIE approach throughout. This two group teaching arrangement formed five of the fourteen HSIE class sessions taught over the period. Activities in the other nine sessions were taught by the researcher to

the whole class, and included internet based research, map drawing, play enactment and two oral group presentations to class.

Phase 2 research design

Phase 2 research was conducted as a whole-class, single case study with a Year 2 class at the same school during a later practicum. The change in class occurred because of teacher and school constraints. Opportunities for exposure to reading comprehension activities was limited by competing curriculum needs, student absenteeism caused by illness and timetabling changes. A simplified version of the RT approach, involving only the 'questioning' strategy was modelled and students were monitored in its application. Students were encouraged to develop their assessment activity based on its use.

Data analysis

Both pre-test and post-test assessment rubrics used in Phase 1 were developed in consultation with the class teacher. Analysis of results was based only on questions regarding content common to both tests. The post-test rubric also contained additional questions concerning content learned during the research period; the answers were analysed for evidence of strategy use.

Quantitative data was analysed using descriptive methods, t-tests and the use of MANOVA (Mean Analysis of Variance) techniques (Kinnear & Gray, 2008, Chapter 7; Isaac & Michael, 1989, p. 182). Qualitative data were collected and consisted of: student journal entries based on three set questions and a free response section; teacher diary notes of student behaviours, comments and reactions to the

experimental process; and transcripts of post-test student interviews. All qualitative data were examined using methods of Thematic Analysis and evidence of acquisition of RT skills was sought to determine if students had benefited from integrating the strategies into their reading practices. Based on evidence of skill development, the data from Phase 2 were aimed at determining whether younger students could improve their reading comprehension skills, using the 'questioning' strategy.

Ethics

This study received ethical clearance from the Avondale College HREC. During the study, no personal information was sought from the students, and the identities of both the students and participating school were not revealed. Group member names were coded to preserve student anonymity. In accordance with HREC guidelines, an initial letter was sent advising parents of the reason for the study, followed by a letter seeking permission for student participation in post-test interviews. The initial student participation permission letter (see Appendix I) informed parents of the reading comprehension technique trial as part of regular teaching practice; this was approved by administration and submitted on school letterhead. The student interview permission letter (see Appendix IV) sought permission to interview selected students after completion of the post-test. This was to be done in the presence of the classroom teacher.

The following chapter presents the results of the study.

CHAPTER 4

ANALYSIS OF RESULTS

Introduction

This chapter presents the results of the study in five sections. The first section argues for the equivalency of participants in the control and experimental groups; the second deals with the determination of learning in the two groups; and the third examines the qualitative data related to skill acquisition among members of the of the Year 4 class. All three sections relate to Phase 1 of the study. The fourth section examines data arising from the case study with the Year 2 class, and the final section presents the summary of findings.

Section I: establishing equivalency in Year 4 sex, age and ability.

Description of participants

The participants were all part of the Year 4 class assigned to the researcher for practice teaching in February, 2008. All participants obtained parental permission to participate in the study. Initially, the research method intended that the control and experimental groups be balanced according to sex, age and ability as measured by Ravens Progressive Matrices. However, the home teacher exercised her right to allocate the students according to behaviour and social interaction. Tables 1, 2 and 3 provide a view of the control and experimental groups by sex and age.

Table 1: Statistics cross-tabulation (group membership vs. sex)

		Grouping		
		Control Group	Experimental Group	Total
Sex	Female	8	9	17
	Male	5	3	8
Total		13	12	25

It can be seen from Table 1 that there were twice as many girls as boys in the Year 4 class and that the number of girls in the groups was relatively even. However the control group contained five boys while the experimental group contained only three.

Table 2: Control and experimental groups by age in years and months

	Grouping		
Age in years and months	Control Group	Experimental Group	Total
8y 0m – 8y 5m	0	1	1
8y 6m – 8y 11m	3	2	5
9y 0m – 9y 5m	6	7	13
9y 6m – 9y 11m	4	2	6
Total	13	12	25

Table 2 indicates a relatively even distribution of participants by age. Table 3 affirms this by providing the mean ages and variance for each group as measured in months. While the experimental group has a slightly wider distribution in age (as measured by the variance) the mean ages at 111.4 months and 110.4 months are very similar. A t-test (see Table 4) indicates no real difference in ages of the two groups ($t=0.51$; $p>0.05$). Cohen's d score 0.19 indicates a small effect size.

Table 3: Statistics cross-tabulation (group membership vs. age)

	Grouping	N	Mean	Std. Deviation	Variance	Std. Error Mean
Age in months	Control group	13	111.38	4.33	18.75	1.20
	Experimental group	12	110.42	5.25	27.56	1.52

Table 4: Independent samples t-test (mean age comparison)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Age in months	Equal Variances assumed	.062	.806	.505	23	.619	.968	1.918	-3.000	4.936
	Equal Variances not assumed			.501	21.419	.622	.968	1.933	-3.048	4.984

Table 5 indicates that although the mean scores of the control and experimental groups for measure of ability (using Ravens Matrices) were very close at 37.9 and 37.5 respectively, the experimental group had a much broader spread of scores (as measured by the variance). A t-test (see Table 6) indicates no real difference in the means of the two groups ($t=0.12$; $p>0.05$) and a Cohen's d score of .051 indicates a negligible size effect. Had the choice of control and experimental groups been based on the Ravens Matrices scores, the spread in scores may have been more similar.

Even though the choice of students placed in the experimental and control groups was based on the teacher's experience, the two groups were very similar in measures of sex, age and ability (based on Ravens Matrices results). Therefore, for testing purposes, it can be assumed that the two groups were alike.

Table 5: Control group and experimental group means

Grouping		N	Mean	Std. Deviation	Variance	Std. Error Mean
Ravens Matrices	Control group	13	37.85	4.018	16.144	1.114
	Experimental group	12	37.50	9.229	85.174	2.664

Table 6: Ravens Progressive Matrices: Independent samples t-test

	t-test for Equality of Means						
						95% Confidence Interval of the Difference	
Ravens Matrices	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal Variances assumed	.12	23	.90	.35	2.81	-5.46	6.153
Equal Variances not assumed	.12	14.8	.91	.35	2.89	-5.82	6.510

Section II: determination of Year 4 learning

Four students were absent during the data collection period; two for the experimental group pre-test and two for the experimental group post-test. Their results were omitted from the data before analysis. Time did not permit a testing of these students at a later date. The pre-test and post-test contained a core of repeated questions that were knowledge based and arose from the readings employed with both the control and experimental groups.

The pre-test

Table 7 indicates that the average of the pre-test scores for the entire class was 2.14, while the mean scores for the control group and experimental group were 1.92 and 2.5 respectively. Analysis of variance (see Table 8) indicates that the difference between these mean scores was not significant ($F=1.34$; $p>.05$). Essentially the mean scores of the control and experimental groups on the pre-test can be regarded as equivalent.

The post-test

After the intervention with both groups, the post-test was administered. The mean score for the whole class was 4.52 while the mean scores for the control group and experimental group were 4.54 and 4.50 respectively (see Table 7). Again the ANOVA (see Table 9) indicated no difference in the post-test scores for the control and experimental groups ($F=0.68$; $p>0.05$). These results are shown in Figure 1.

Table 7: Comparison of means between pre-test and post-test

	Grouping	Mean	Std. Deviation	Variance	N
CorePre	Control group	1.92	.760	.578	13
	Experimental group	2.50	1.195	1.428	8
	Mean / Total	2.14	.964	1.00	21
CorePost	Control group	4.54	1.330	1.77	13
	Experimental group	4.50	1.195	1.43	8
	Mean / Total	4.52	1.250	1.60	21

Table 8: Means pre-test

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.881	1	1.881	1.343	.260
Within Groups	29.423	21	1.401		
Total	31.304	22			

Table 9: Means post-test

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.108	1	.108	.068	.797
Within Groups	33.631	21	1.601		
Total	33.739	22			

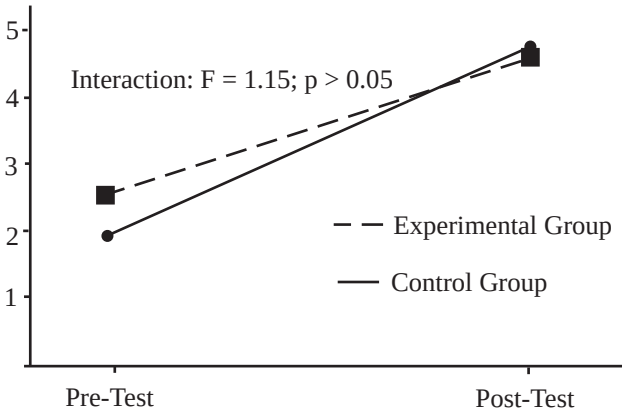


Figure 1: Pre-test/post-test means comparison

The questions to be answered are:

1. Did learning take place in both the control and experimental groups?
2. How did the learning in the experimental group compare with the learning in the control group?

A ‘mixed between-within subjects’ MANOVA (Pallant, 2007) was used to test these questions using the ‘SPSS’ General Linear Model with repeated measures. The main effects (see Table 10) indicated that the post-test scores were significantly greater than the pre-test scores for both groups ($F=64.5$; $p<0.05$) suggesting that learning took place in both groups. However, there was no interaction between group membership and the pre-test and post-test scores ($F=1.15$; $p>0.05$). This indicates that group membership made no difference to the learning that occurred. Hence, it can be argued that there was no disadvantage in terms of content knowledge to the students who were placed in the experimental group and undertook instructional activities involving RT as compared to the control group who received traditional instruction.

Table 10: Two-way between groups ANOVA

Source	prepost	Type III Sum of Squares	df	Mean Square	Partial Eta Squared	F	Sig.
Intercept		448.718	1	448.718	0.93	261.34	0.000
Group		0.718	1	0.718	0.02	0.42	0.526
Pre/Post (Main Effect)		52.747	1	52.747	0.77	64.50	.000
Pre/Post * Group (Interaction)		.938	1	.938	0.05	1.15	.298
Error(Pre/Post)		15.538	19	.818			
Error		32.615	19	1.717			

Section III: qualitative data - Year 4 assessment of reading skills acquired

Internalisation of processes

Having established that there was no disadvantage with the use of RT, is there evidence to suggest that the Year 4 students in the experimental group internalised the RT process?

Students in both the control and experimental groups were given three opportunities during the intervention period and one at the conclusion, to make individual journal entries. Data suggests that the 'clarifying' and 'questioning' strategies were particularly useful in building a personal understanding of the text, serving as a platform for further exploration.

The 'clarifying' strategy draws student attention to aspects of the passage which may not make sense to them because of unfamiliar vocabulary and phrasing, and complex ideas or concepts. 'Questioning' of the text by the reader involves identifying material within the passage worthy of investigation. Students then frame the question, and engage in self-testing.

In response to 'clarifying', the experimental group stopped to discuss time comparisons and students were amazed at the ancient roots of aboriginal culture (around 50,000 years old). Six students from the experimental group remarked on this fact compared to only one student from the control group. It appears that the concept of time could be difficult to comprehend for students who were grounded in concrete operations.

In response to ‘questioning’, Student 8 (a high RM achiever from the control group) asked a very explicit question:

> Student 8: “Why [did] Charles deGroot cut the ribbon for the opening of the Harbour Bridge?”

Her query indicated that she had not understood the motive for the action taken, and suggests that overt questioning of the text may not have taken place. Student 8 would have benefited from the open discussion concerning ‘questioning’ that was encouraged in the experimental group. In another question, Student 8 was curious to investigate aspects of aboriginal culture:

> Student 8: “I would like to hear one of their stories and see one of their dances.”

In RT, this type of enquiry would receive directed attention and serve as a model question for the other group members who would all benefit from the social learning interaction and peer tutoring that would eventuate.

Evidence that the ‘questioning’ strategy stimulates subject enquiry

When answering the end of unit journal question ‘things I want to know about’, eight participants from the experimental group wanted to know more about content discussed during the unit, yet only four students from the control group had further questions. During the treatment, data were collected from classroom observations and student journal notes. The experimental group was acquiring the habit of consciously questioning the text for meaning, identifying information as substance for posing a thoughtful question, and monitoring their own progress through self-

testing. The ability to generate their own questions appeared to interest the participants in purposeful activity. To them this may well be different to responding to queries generated by the text or the teacher. The participants appeared to enjoy the informed discussion that the RT framework provided, and interest heightened as they became more actively involved in owning a personal understanding of the text, creating a desire to know more.

Post-test interview

Four students of varying ability (based on Ravens Matrices test results) were chosen from each group to respond to four non-leading questions and then given opportunity to answer a free response question. Students were not coached to provide responses in any way.

Question 1: "Have you enjoyed the unit? Explain."

All participants (except Student 4 from the control group who was unresponsive to all questions) answered that they enjoyed the unit content, the activities and assignments. Exploring aboriginal culture, giving oral presentations and participating in the class quiz were highlights. No comments were made on the teaching methods.

Question 2: "What new things have you learned?"

Both groups recalled content learned, but the experimental group gave more descriptive detail. For example, three participants from the control group answered to only one topic each. Of the control group, three participants commented on two to three topics of interest.

Question 3: "Has this unit helped improve your reading skills?"

In the control group: three students responded with 'no'. Of these three, Student 8 (who scored well on the Ravens Matrices test) asserted that she was already a good reader. One student from the control group stated that their reading skills improved as a result of the HSIE unit.

Of the experimental group, three participants indicated that their reading comprehension had improved. Their responses indicated that the 'clarifying' strategy had helped them the most.

For example, learning new vocabulary was important for Student 23. Word decoding and usage was the issue.

> Student 23: "Yes, [because of clarification] I have learned different words and how to pronounce them."

As a second example, Student 7 commented on how clarification of word meaning had assisted in reading comprehension.

> Student 7: "Yes, [because of clarification] I have learned new words."

Student 16 indicated that RT 'clarifying' within the social context of RT had benefited her. She also revealed an impediment to reading.

> Student 16: "Yes - it helped my concentration. I have a spot on the back of my eye."

Student 16 suffered a learning disability which inhibited coordination of visual information. RT engages both the visual and auditory learning styles, and Student 16 maintained her motivation to learn, most likely drawing upon its auditory aspect. The

RT process helped Student 16 maintain focus on the text and overcome her limitations in relying on sight alone to comprehend text.

Question 4: *"How were you able to answer the questions (what techniques did you use)?"*

In the Control group, three participants revealed two strategies employed by the classroom teacher: having students highlight the main points, and also rereading the text. The fourth participant was unsure what strategies were used.

The experimental group were asked "Were any of the four strategies helpful?" All participants indicated that the four RT strategies were recalled and employed.

Student 7 found that 'clarifying' the text through discussion benefited other group members.

> Student 7: "I liked how some people could explain what some words mean."

Student 6 recalled the final act of 'summarising', and commented on how 'clarifying' helped to identify meaning at the word level.

> Student 6: 'Yes - the summarising at the end. The clarify helped to know what the words mean.'

Student 16 commented on how the four strategies of RT provided a means of interrogating the text to locate specific information.

> Student 16: "Yes they helped me because I would never have thought to answer the questions."

Student 23 had used all four strategies to effect in group work. She was the first group member to gain skill in 'summarising': drawing the main points of the text together in a brief restatement of facts in her own words.

> Student 23: "…Predicting was helpful. Summarise meant going through the paragraph and remembering what happened."

Section IV: qualitative data - Year 2 assessment of reading skills acquired

Qualitative evidence to suggest benefit of RT to Year 2 students.

In a short case study, data were collected from classroom observations of Year 2 students during the second (and later) teaching practicum. The students' task was to read the text, establish relevant facts, derive specific details from it, and produce an Information Report for the HSIE unit developed by the practicum teacher. Eight of the eighteen students were absent due to illness. Students were cooperatively grouped and given instruction in using the 'questioning' strategy, with repeated teacher modelling throughout the lesson. This was an adaptive approach of RT as used by Ems (1988). The text reading comprehension level was relatively difficult and required teacher assistance and modelling for word decoding. When shown how to actively monitor their understanding of content by questioning word meaning, all students passed the assessment by providing a written response to indicate their knowledge of the content.

Using 'questioning' to develop a list

Student 38 frequently struggled with sentence construction and elaboration, and initially appeared to lack a specific strategy to extract information from text. However, his assessment piece showed evidence of detailed information gathering. He used the 'questioning' strategy to identify and list many of his animal subject's features and comment on its habitat. Further, he used this information to provide a concluding statement supported by the specific knowledge he had gained about the animal's place in its environment.

'Questioning' to paraphrase text: two student examples

Working at the meaning level, Student 35 was able to present the facts in a paraphrased form. Using different and equivalent words to describe subject traits, she displayed the ability to synthesise facts and then write the information in her own voice. Cognitively, Student 35 displayed the ability to question the meaning of the content and prove her understanding.

Student 36 was a struggling reader unused to interrogating the text. He questioned an amphibian's life cycle, then explained it in brief form: 'the eggs turn into tadpoles then frogs'. He recorded the process in his own informal language. This student ranked in the lower 20% of his class for literacy and was a member of the literacy support group. With scaffolded assistance, he was able to read and then paraphrase information for a written report. This was a significant achievement for him.

Study findings

The control and experimental groups could be regarded as equivalent in sex, age and ability. Both the control group and the experimental group achieved learning as a result of the interventions. There was no difference between the control group and the experimental group in terms of the degree of learning that occurred. Hence there was no disadvantage to the experimental group in employing the principles of RT within the HSIE classes. In addition, there was the hint that students in the experimental group began internalising the processes that improved their metacognitive skills with text and this could possibly be the first step toward the students becoming critical thinkers. Finally, the small case study with the Year 2 students hinted at the capability of teaching the RT reading comprehension activity as early as Year 2.

CHAPTER 5

CONCLUSIONS

Discussion

The four strategies of Reciprocal Teaching (RT): 'questioning', 'clarifying', 'summarising' and 'predicting' teach students to focus on the meaning of the text (Palincsar, 1986, p. 772). As such, they are a means of teaching skills of reading comprehension and contribute to the development of critical thinking skills. Further, the four strategies provide a structured, metacognitive approach to reading comprehension. The process of RT was not meant to be a 'once-only' process, but a long term and ongoing development of strategies by which students learn to interrogate text. Reciprocal Teaching was designed for use in teaching skills of reading and was therefore initially limited to the subject of English reading. This study examined the ability to take these skills and apply them to the textual passages that form a part of a subject other than English; in this case Human Society and Its Environment (HSIE). As delineated in Chapter 1, the research study set out to answer the following three questions:

1. Can Reciprocal Teaching be applied to reading passages in subjects other than English without detriment to the learning that should take place in that subject (in this case, HSIE)?
2. Is there evidence to suggest that when the RT approach to reading comprehension is applied to reading passages in a subject other than English

(in this case HSIE), students can give evidence of internalising the skills involved?

3. How early in the school life of a student, can the use of RT strategies be taught with reading passages in subjects other than English (in this case HSIE)?

Broadly, the Phase 1 findings of the previous chapter indicate that in comparison to students being taught by their regular teacher using her traditional approach, and in terms of learning HSIE content, there was no disadvantage imposed on the students who were taught to use the strategies of RT by the researcher. There was no difference in the learning exhibited by both groups, in terms of test results. Both the researcher and the regular teacher employed identical reading passages with their students, and the students in each class were balanced for age and ability. However, the qualitative data do suggest that those students participating in the RT approach began to internalise the skills involved. Some students addressed combinations of the four strategies, indicating that the structure of RT aided in its learning. One student who suffered learning difficulties found that the public nature in which these strategies were employed in the group facilitated her learning. Most importantly, students implied that the use of these strategies improved their comprehension of the passages involved, which led to development of further questions. This type of curiosity is important to motivation in learning. Finally, short as the process was, the Phase 2 data suggested the possibility that Reciprocal Teaching could begin as early as Year 2.

Implications

The implication of these findings is that the RT process can be employed with reading passages in subjects other than English without detriment to student learning in those subjects. Students can learn to be more metacognitive in their approach to reading through the use of RT strategies. Reciprocal Teaching, which is regarded as an ongoing process, may be started as early as Year 2 and therefore as students employ it over time, they can mature in their interactions with text in all areas. As such, this process will meet the demands of curriculum authorities, requiring that literacy become a part of all subjects, and that students be taught to become critical thinkers.

Limitations

There were a number of limitations on the study. Firstly, the nature of the teaching practicums meant that research was not only divided in time, but divided between classes of quite different characteristics, and between two home teachers who had different expectations of pre-service teachers. This meant that research plans had to be malleable in order that data could be collected. For example, in Phase 1 of the study, students were allocated primarily according to factors related to sociability and management and not according to the original plan. The division of the practicum also meant that the time allowed for each phase of the study was minimised. The RT process is meant to continue over time; students are to absorb and experiment with the process as they internalise the skills. The time spent was so short that evidence could only hint at the internalisation process.

Secondly, since Phase 1 of the study was undertaken within one class, the numbers of students were small and the effect of several absences became an important factor. Hence the results and their implications are limited.

Thirdly, the number of pre-test and post-test questions was very short and should have contained more than seven core test items.

Fourthly, the Phase 2 process was short and could not produce conclusive results. Even so, it did hint at the possibility that Year 2 students could learn to use the strategies of RT.

Recommendations for further research

Further research needs to undertaken in other content based KLAs of larger sample population, with multiple teachers under more stringent conditions. The Science and Technology KLA would provide content rich in both principles and concepts embedded with appropriate technical language suitable for testing with Reciprocal Teaching. A larger sample population over a diversity of ethnic cultures would offer a more substantial indication of results on which to form generaliseable evidence-based conclusions. The use of numbers of teachers in different school settings would eliminate individual teacher bias. The employment of longitudinal studies would provide a measure of adoption and retention of strategies over time; of benefit to an approach designed to automate reading comprehension habits over the long term.

Value of the study to the researcher

As literacy is the foundation on which all school learning is based, research into the application of reading comprehension to other KLAs is a logical extension of enquiry. The ability to derive meaning from text and directly apply the information is of personal interest to me as a classroom teacher. This is because the level of individual literacy will influence a student's overall academic results, and ultimately their future career opportunities (Rowe, 2005). As maximum learning from text requires a complete understanding of what is read, it is my desire to apply Reciprocal Teaching in other content-based subject areas to the benefit of all my future students. Finally, this provides my teaching with an evidence-based platform for integrating literacy skills into subjects other than English.

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Appendix I

Student participation permission letter

RE: Class participation in research assignment

Dear parents of children from class 4M

As part of the school teacher student program, I will assist in teaching your child during the period from 4th – 29th February, 2008.

Within, and as a part of my regular teaching practice, I am conducting a research project. It involves investigating the use of an accredited English teaching technique, applied to another subject within the curriculum. As a part of normal teaching practice all children will participate in the study. However, participation in the interviews about the study is voluntary and student participants may withdraw from the interview process at any time. You will receive notification with a permission slip prior to the commencement of interviews.

Normal assessment procedures employed during class will generate the information required by the study and this data will be analysed in bulk. The school and student names will not be identified, and no personal information of any kind will be sought by the study. Data will be stored securely and full confidentiality will be maintained at all times.

The purpose of this letter is simply to reassure parents that this college research assignment will be conducted as part of regular teaching practice. This study has the approval of the school principal, Mr Michael Hannah and the Avondale College Human Research Ethics Committee. As a part of this ethics clearance, the following statement must be presented to you.

> This research project has been approved by the Avondale College Human Research Ethics Committee (HREC). Avondale College requires that all participants are informed that if they have any complaint concerning the manner in which a research project is conducted it may be given to the researcher, or if an independent person is preferred, to the College's HREC Secretary, Avondale College, PO Box 19, Cooranbong, NSW, 2265 or phone (02) 4980 2121 or fax (02) 4980 2117 or email: research.ethics@avondale.edu.au

Sincerely

Tim Cooper (student teacher)

Appendix II

Pre-test questions

Name_____

‘Australia, you’re standing in it’ pre-test

The Sydney Harbour Bridge

1. What is the capital city of New South Wales?_____
2. In what year was the Sydney Harbour Bridge opened?_____
3. How many traffic lanes are in use on the bridge?_____
4. How long did the bridge take to build?_____
5. How many vehicles travel the bridge each day? 160 or 160,000 (Circle the correct answer)
6. What is the nickname of the bridge?_____
7. Other things I know about the bridge_____

Appendix III

Post-test questions

Name_____ **‘Australia, you’re standing in it’ assessment (Page 1)**

The Sydney Harbour Bridge

1. What is the capital city of New South Wales?_____
2. In what year was the Sydney Harbour Bridge opened?_____
3. How many traffic lanes are in use on the bridge?_____
4. How long did the bridge take to build?_____
5. How many vehicles travel the bridge each day? 160 or 160,000 *(Circle the correct answer)*
6. What is the nickname of the bridge?_____
7. Other things I know about the bridge_____

The Tree of Knowledge at Barcaldine

1. Is the Tree of Knowledge 150 or 500 years old? *(Circle the correct answer)*
2. What political party was founded there?_____
3. Why is it called the “Alleluia Tree”?_____
4. Did the ‘Great shearers’ strike” occur in 1891 or 1950? *(Circle the correct answer)*
5. How many shearers went on strike?_____
6. Which is the oldest political party in Australia?_____
7. What made it special?_____

Name_____ **‘Australia, you’re standing in it’ assessment (Page 2)**

Sites of aboriginal culture

1. Name a special feature of a ceremonial site_____
2. How big is a Bora Ring?_____
3. What can you find at a midden?_____
4. Why is the land so special to the aborigines?_____

   _____

Port Arthur

1. Was Port Arthur settled in 1830 or 1930? *(Circle the correct answer)*
2. What was Tasmania first named?_____
3. How were the first convicts treated?_____
4. Name one industry established in Port Arthur_____

The activity I liked **most** in this unit was_____

The activity I liked **least** in this unit was_____

My group worked the best when_____

The thing I found most interesting in this unit was_____

Appendix IV

Student interview permission letter

RE: Student participation in research response.

Dear parents of children from class 4M

As part of the previously advised current research being undertaken during the period from 4th – 29th February, 2008, I am organising to interview selected students to obtain their responses to the study.

Student participation in the interview is entirely voluntary and will take place in the presence of the classroom teacher.

Please return the bottom part of this form signed by a parent/carer if you give permission for your child to participate. As a part of ethics clearance I am required to supply you with the following statement.

> *This research project has been approved by the Avondale College Human Research Ethics Committee (HREC). Avondale College requires that all participants are informed that if they have any complaint concerning the manner in which a research project is conducted it may be given to the researcher, or if an independent person is preferred, to the College's HREC Secretary, Avondale College, PO Box 19, Cooranbong, NSW, 2265 or phone (02) 4980 2121 or fax (02) 4980 2117 or email: research.ethics@avondale.edu.au*

Sincerely

Tim Cooper (student teacher)

Permission to participate in research interview
(re: Tim Cooper student teacher research)

As parent/carer, I hereby give permission for my son/daughter

_____ to participate in the research

interview to be conducted in the presence of the classroom teacher.

Signed_____ Name_____

Date_____

Appendix V

Student journal questions

Student journal questions

1. Things I found interesting
2. Activities I enjoyed
3. Things I want to know about
4. My comments