Teaching Year Four students who are independent text decoders but who have difficulties with comprehension, to conduct a conversation with the text and develop the strategy of thoughtful questioning will increase their reading comprehension of factual text.

Abstract

As children move from the junior levels of primary school they have been taught to decode text at word and sentence level. They have been successfully taught the reading strategies and can use these independently. As they reach the middle years of school a void is detected and that is these efficient word decoders have very little understanding of what they read. They have not reached a level of thoughtful literacy.

The hypothesis of this study is that teaching Year Four students who are independent text decoders but who have difficulties with comprehension, to conduct a conversation with the text and develop the strategy of thoughtful questioning will increase their reading comprehension of factual text. Research conducted on the advancement of comprehension indicates that teaching strategies greatly enhances the ability to comprehend a text. Questioning is one such strategy that has been researched and found to be an effective tool in the development of reading comprehension.

The study compared the results of two groups of students; a teaching group, who were taught to use questioning when reading and a control group who received no intervention. These two groups of students were matched as closely as possible using the criteria of age, gender and previous comprehension results. Results indicate support for the hypothesis as the questioning scores for all students in the teaching group improved. The post test comprehension results reflected gains made be all but one of the teaching students.

The results suggest teaching students to question as they read and think about the text by talking to it, is a successful comprehension strategy to teach students in the middle years.

Introduction

Many students who reach the middle and upper levels of primary school are competent readers in so far as they can read the words on the page. They have reached an acceptable reading level and meet all the appropriate benchmarks. They are able to use the different reading strategies taught to them in the lower levels and vocalise these strategies in parrot form. However, many of these children who are able to decode words easily are unable to comprehend. Research shows that "knowledge and activities recognising individual printed words are useless in and of themselves…" (Adams, 1990 cited in Brown, et al. 2005) When they move out of these lower grade levels the emphasis moves from being a good word decoder to being competent

in comprehending what is read. These students begin to experience difficulties when they are expected to show understanding of what they have read at both literal and inferential levels. "Reading comprehension, the construction of meaning from text, is considered to be the most crucial academic skill learned in school." (Mastropieri & Scruggs, 1997; cited in Mason, 2004)

The rapid growth of technology in the world today presents many dilemmas for children that impact on their reading ability. The volume of print, the complexity of print, particularly from electronic sources and the availability of information from a wide range of sources, that need to be viewed critically, remind us that the children we teach need to be equipped with the skills and strategies to deal with the changing world of print. (Hervey, 2006) Explicit teaching of the skill of questioning as a comprehension strategy can work towards helping students construct meaning from a text and become a more thoughtful reader.

Researchers believe that when good readers read they conduct an inner conversation with themselves and this is done by asking questions. "This inner conversation leads to thoughtful engaged reading–reading that enhances student's understanding, builds their knowledge, and develops their insights. (Harvey, 2001) A study conducted by Litwiller Lloyd (2004) discovered that after teaching children to question, the students were able to use this skill to clarify meaning, identify confusing vocabulary and explore the author's intentions.

From the time we are born we work towards making sense of our world through the use of what we all naturally have at first, an inquiring mind. Children, from a very young age constantly ask questions, sometimes driving their parents to distraction. This ability seems to come automatically at first and yet when many children enter the school system this ability to inquire and question seems to come to a halt. Hervey (2006) questions why students who are generally skilled at asking questions do not continue this strategy for comprehending what they read. One possible suggestion made by Hervey (2006) is that as students enter school it is the teacher who tends to take over and ask most of the questions. During the research conducted by an American school in Maryland it was noted by those involved that evidence suggested that teachers were not teaching children how to comprehend but merely assessing "the presence or absence of comprehension" (Pressley and Wharton-McDonald, 1997; cited in Diehl, 2005).

When children are in the junior levels of primary school their teaching largely focuses on word decoding and developing proficient reading strategies at word and sentence level. Comprehension has not been a priority at this level and so difficulties are not always detected. The comprehension strategy of questioning is a higher order skill and research supports the theory that children are not developmentally ready for some of these comprehension teaching

strategies until they reach the middle years of school. Research supporting this was conducted by Miller & Pressley (1989; cited in Trabasso et al, 2001) and found that questioning was responsible for reducing the text memory of young students (5–7 years of age) They found that when the child attempted to formulate a response to a question by searching for relevant information it may "compete with the child's spontaneous comprehension processes for limited working memory resources and may severely impair inference generation of any kind" (Miller & Pressley, 1989). This research goes on to suggest the older reader's word processing may be automatic enough to allow for more attention to be devoted to handling questioning. Further research in this area (Leach et al, cited in Woolley, 2005) observed that the first signs that students may have comprehension difficulties appeared when those students reached the middle years of school. Before this they suggest that students read mostly narratives that provide little challenge with regard to comprehension. In the middle years the texts presented to learners become increasingly more complex and the emphasis is more on comprehension to understand ideas, concepts and vocabulary that is more specialised. (Woolley, 2005)

Knowing the comprehension difficulties particular students experience when reaching the middle years of school combined with the research that has been conducted on the effectiveness of teaching the skill of questioning to students at this level, I have chosen to select a group of Grade 4 students to be involved in this research project. Developing the reader's ability to engage with the text, think while reading, reflect critically and delve deeper into the text can be done through the explicit teaching of the skill of questioning. As Albert Einstein said, "The important thing is not to stop questioning" (cited in Van Gorder, 2003)

Method

Design

This study uses a case study oxo design. A selected group of students will be pre-tested, be given explicit teaching of the comprehension strategy of questioning and then post tested to measure the effectiveness of the questioning strategy and what impact it has made on their ability to comprehend factual texts. The study compares two groups of students, a teaching group and a control group.

Participants

This study was conducted in a small rural school situated in an outer North West suburb of Melbourne. The participants were a group of 8 Grade 4 students with an average age of 9 years. Of the 8 students there were 4 boys and 4 girls. These Grade 4 students were selected from a multi-age Grade 3/4 class and were chosen to be the teaching group. A further 8 students were selected from the other

two Grade 3/4 multi-age classes in the three stream school as the control group.

The teaching group students were specifically chosen on the basis of a previous Torch assessment which produced low comprehension scores. All are competent at decoding text and have achieved an independent reading level. It must be noted that there are three ex Reading Recovery students in the teaching group as compared to one in the control group. Another factor that is significant amongst the teaching group members is that two have very noticeable comprehension difficulties that have resulted in them being formally tested for possible further intervention offered by the school.

The teaching group was matched to the control group as closely as possible using the criteria of age, gender and testing scores. All students were given the same pre tests in reading comprehension and questioning. The collected information on each of the teaching and control group students is presented in Figure 1. The teaching group was matched with the control group using a correlating number as shown below-

Teaching Group	**Control Group**
Student 1	Student 9
Student 2	Student 10
Student 3	Student 11
Student 4	Student 12
Student 5	student 13
Student 6	Student 14
Student 7	Student 15
Student 8	Student 16

Figure 1

	Months	Grade	Group	Sex	ESB	LD	EI	MI	QPTS	TPTS	GF
1	117	4	T	F	Yes	No		Hearing aides	4	38	
2	115	4	T	M	Yes	No	RR		5	31	
3	117	4	T	M	Yes	Dyspraxia	RR		3	33	
4	117	4	T	F	Yes	No			1	25	
5	110	4	T	F	Yes	Comprehension difficulties, tested for ERIK			0	27	
6	112	4	T	M	Yes	Comprehension difficulties, due to commence ERIK	RR		1	29	Government Reading Assistance Program
7	119	4	T	F	Yes	No			3	35	
8	121	4	T	M	Yes	No			9	35	
9	124	4	C	F	Yes	No			1	38	
10	115	4	C	M	Yes	No			1	27	
11	120	4	C	M	Yes	No	RR		2	27	
12	116	4	C	F	Yes	Reading difficulties			1	25	
13	112	4	C	F	Yes	No			2	29	
14	119	4	C	M	Yes	No			0	27	
15	124	4	C	F	Yes	No			8	35	
16	116	4	C	M	Yes	No			1	36	

Legend

ABBREVIATION	CLARIFICATION
Months	Total age at time of testing
Grade	Year Level
Group	Teaching (T) or Control (C)
Sex	Female (F) Male (M)
ESB	English speaking Background
LD	Learning difficulties
EI	Earlier Intervention
MI	Medical Issues
QPTS	Questioning Pre-Test Score
TPTS	Torch Pre-Test Score
RR	Reading Recovery
GF	Government Funding

Materials

The majority of the materials used were prepared by the researcher using a variety of resources.
Materials used include the following

- Question symbol prompt (Appendix 6)
- Posters of statements related to questioning and reading (As listed in Appendix 3)
- Factual sentences collected from a variety of guided reading texts levels ranging from 25 to 28 (Appendix 4)
- Factual sentences matched with multiple choice questions (Appendix 8)
- Factual text, "Sharks" used for modelling questioning strategy (Appendices 2,5)
- Factual sentences and questions related to the topic – ANZAC (Appendix 7)
- Factual paragraphs collected from a variety of guided reading texts levels ranging from 25 to 28 (Appendices 9, 10)
- Pre-Questioning assessment designed by the researcher (Appendix 11)

Procedure

In the pre-testing for this study all students were assessed using Torch Test, "Getting Better." This was administered earlier in the year as part of the whole school pre testing collection of data. The students were also given a pre-questioning test just prior to the commencement of the teaching sessions. This questioning test was designed by the researcher and called upon the students to read six short paragraphs of factual text and write a question that would match what was read. The questioning test was also given as the post test but the post Torch Test was changed to, "Lizards Love Eggs." This was age equivalent to the pre Torch Test.

The eight children chosen for the teaching group were all from the same multi-age level grade and therefore did not have to move to another classroom or change any of their routines. The unit

comprised of an introductory session followed by ten sessions taught consecutively over a three week period. Each of the sessions went for 40-45 minute duration and were conducted within the regular focus teaching session in the morning literacy block. All the children were from the researcher's class and this was valuable because each of them was comfortable and secure working in a familiar environment with a familiar person who they trusted and had good rapport with. The initial introductory session was designed to remind children about what good readers do, introduce routines as well as build the idea of using questioning as a tool for understanding text better. It was also intended to make the students feel relaxed and at ease and impress upon them they were improving their reading by using a skill that they all have had since they were very young. This was done with the purpose of building their confidence and interest in reading as some of the students in this group have displayed signs of poor self efficacy when reading and an overall lack of confidence. In the past some of them have seen themselves as the low achievers in the classroom. After the initial session the direction of the sessions went from teacher led with students observing, teacher led with student help, student led while the teacher helps and finally student led while the teacher observed. This format was designed to gradually released control over to the student and to empower them to use this strategy on their own whenever they read a text. The control group continued with daily literacy sessions in their own classrooms. These sessions were planned by their own teachers and included whole class and focus teaching of comprehension strategies other than questioning.

Results

Results indicate that teaching questioning as a comprehension strategy impacted positively on a group of Year Four students. These students had pre existing comprehension difficulties and showed improvement in questioning and comprehension as seen in their post test scores.

Pre and Post Questioning Scores for Teaching Group

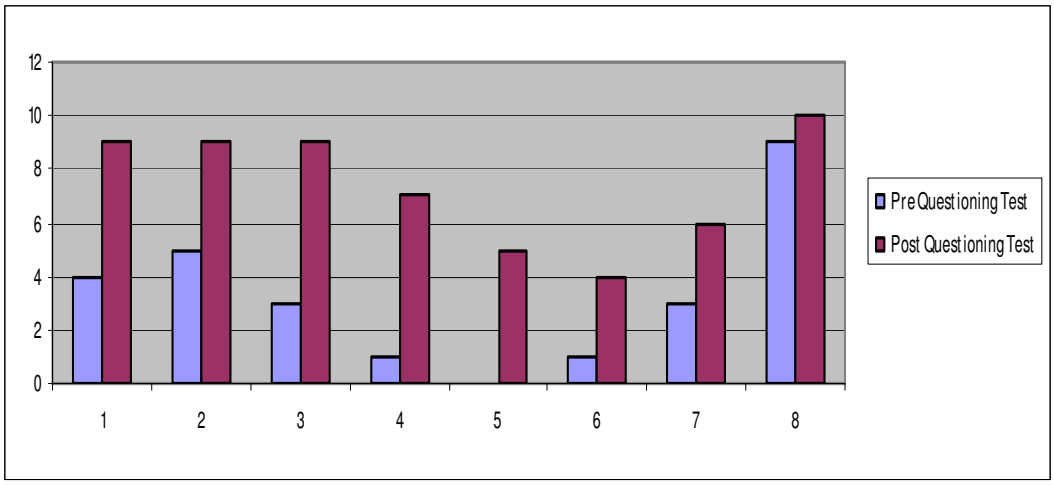

Figure 2

The results collected comparing the student's ability to question before and after the teaching sessions show a marked improvement in the post test results. (Figure 2) Student 5 failed to score at all on the pre questioning test and was able to reach a score of 5 on the post test. In the early teaching sessions she was very quiet and needed to be encouraged to participate. As the sessions progressed there were signs of gradual improvement when she started to make connections, use her prior knowledge to make links with what she was reading and begin to use the words needed to form more open questions. Students I, 3, 4, 6 and 7 at least doubled their pre test score and for some the increase was more than double. Student 8 showed the least improvement on the post test score but he was by far the highest achiever on the pre test score. This could indicate that he had some good questioning skills in place initially and this was certainly evident during the teaching sessions as he stood out as being very competent and was able to formulate quality questions throughout the sessions using the appropriate question words to start his questions.

Pre and Post Questioning Scores for Control Group

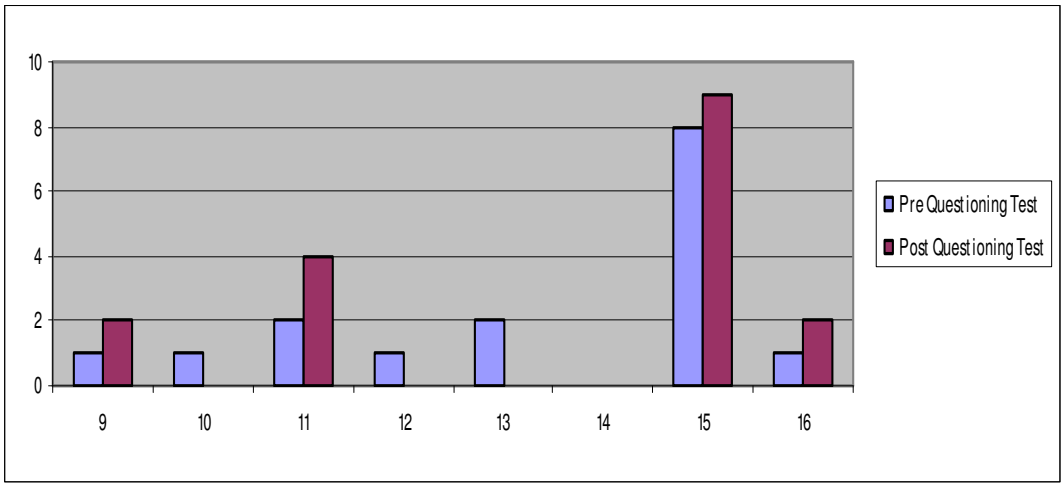

Figure 3

By comparison, the scores collected for the control group show that the teaching group scored higher overall in the pre and post questioning tests. Apart from student 15 all members of the control group scored 2 or less in the pre questioning assessment. (Figure 3) Only 4 of the 8 members of the control group showed improvement in the post questioning test. Most of this improvement was substantial in that nearly all of those who did improve at least doubled their pre test scores.

Pre and Post Torch Scores for Teaching Group

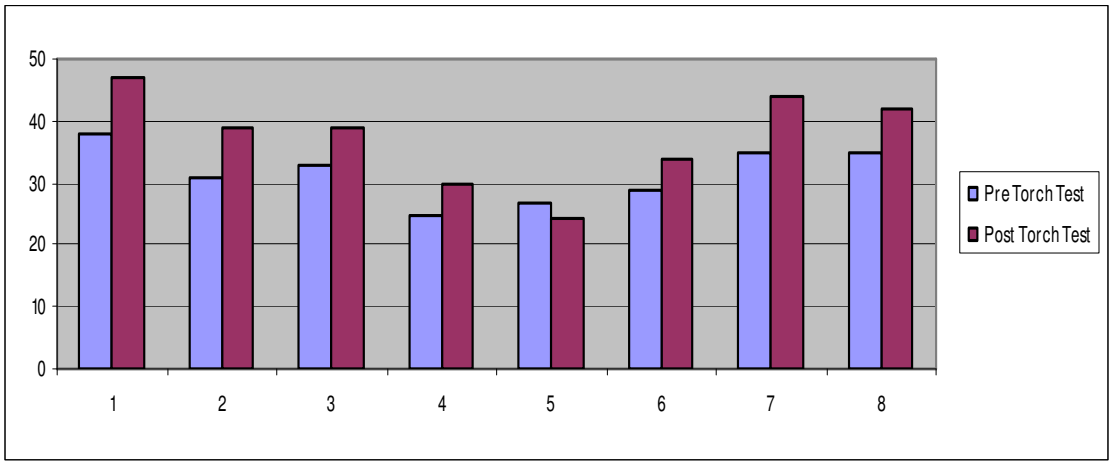

Figure 4

The results collected for the teaching group after completing the pre and post Torch Tests indicate a pleasing improvement. (Figure 4) The majority of the students improved their score ranging from an increase of 5 to 9 on the total Torch score. Student 5 scored less in the post test and this was the same student who failed to score at all in the pre questioning test and who had struggled earlier in the teaching sessions. It must be noted that this student is the youngest in the study with a difference of as much as nine months between her and the oldest in the teaching group. When comparing her to those in the control group there is an age difference up to fourteen months between her and the oldest. This is a significant factor that may have impacted on her results and could possibly be a consideration when viewing her previous low comprehension testing scores. Student 8, who scored well above the others in the pre questioning test was not the highest achiever in the Torch post test but made a considerable gain on his pre test score. Students 1 and 7 recorded higher scores than the rest of the group but student 1 had entered into the study with a higher pre torch score. Her improvement was greater by a score of two when compared to the gains made by students 7 and 8. It was encouraging to see some improvement from student 6 who has comprehension difficulties and who will begin the ERIK program in the near future. It was also encouraging to see improvement recorded by students 2 and 3 who were participants in the Reading Recovery Program in their Grade 1 year.

Pre and Post Torch Scores for Control Group

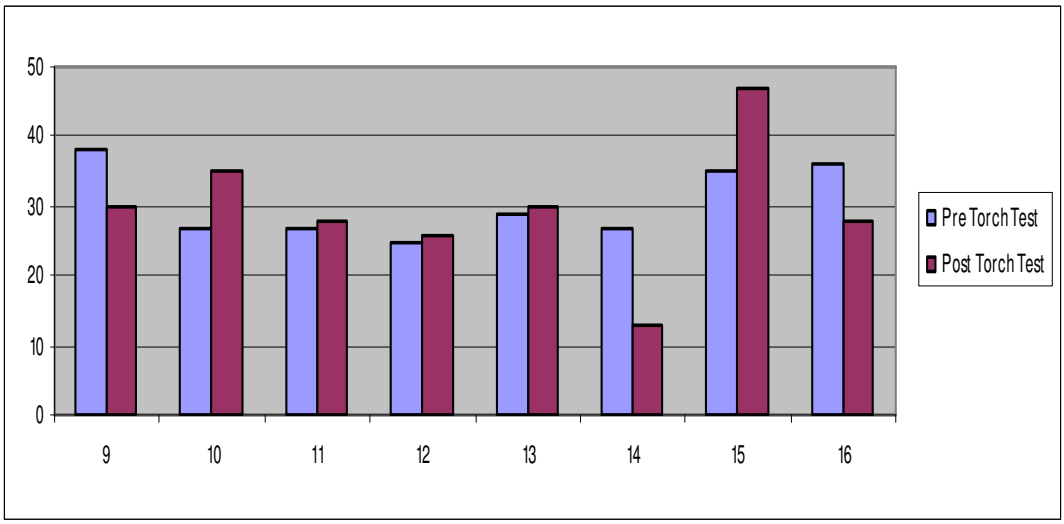

Figure 5

The performance by the control group in the post Torch test was interesting in that there was improvement made by 5 of the students. Some of the gains were very minimal as can be seen for students 11, 12 and 13 where each of them improved their total Torch score by 1. Student 10 and 15 made substantial gains and for student 15 this correlates with her improvement in the post questioning test. There is a considerable age difference between this student and all other students, apart from student 9 in the control group who is the same age as student 15. A difference in developmental maturity is a factor that should be considered when comparing results.

The improvements made by the control group on their post comprehension task can possibly be attributed to the good teaching they have been exposed to in their own grades. These children have been taught a variety of comprehension strategies in their classroom focus teaching sessions and it would be difficult to attribute their improvement to a particular strategy. There was only one student in the teaching group who failed to improve on the post Torch result but by comparison there were 3 students in the control group who failed to make any gains on their pre test results. Students 9, 14 and 16 showed a considerable decline in post test scores but, interestingly students 9 and 16 made gains in their ability to form questions as seen in their post questioning results but this improvement did not directly relate to their ability to comprehend on a higher level.

Total Questioning Scores for Teaching and Control Group

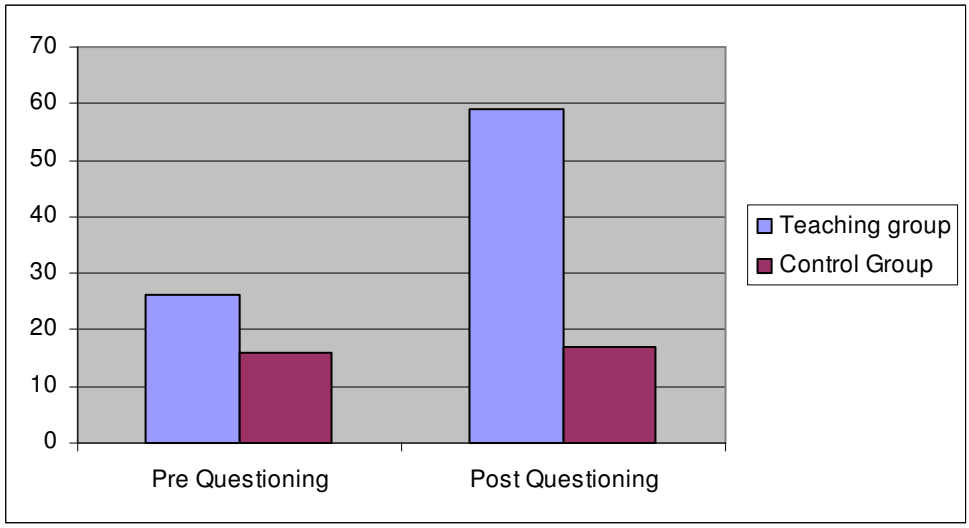

Figure 6

When viewing the total result for each of the groups in questioning it is encouraging to see that the teaching group out performed the control group by a substantial amount. The group score for the control students did not change significantly and the credible results scored by a number of individuals was not enough to support the trend that the control group had improved in the ability to question. (Figure 6)

Total Torch Scores for Teaching and Control Group

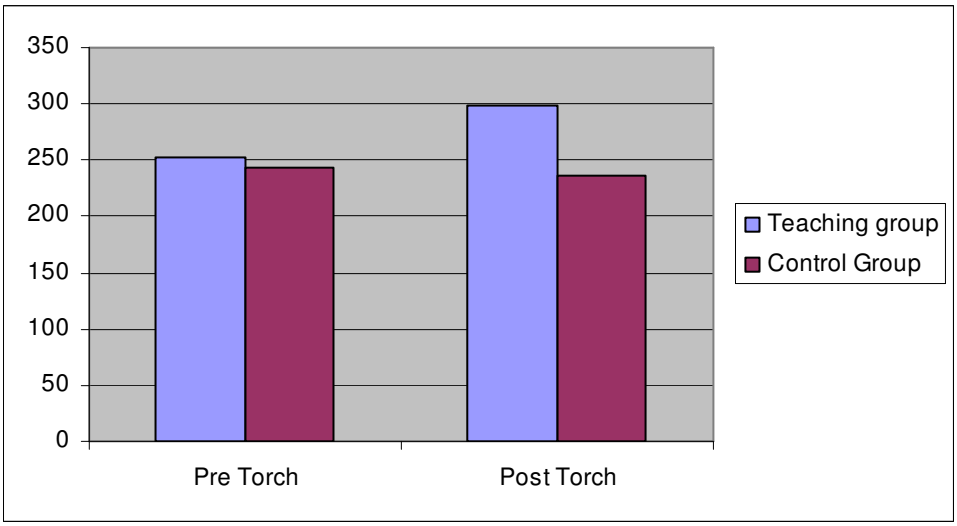

Figure 7

The margins shown in the group scores for the Torch test supports the thinking that teaching questioning will help to improve comprehension. As both groups were fairly evenly matched in the pre test scores it is very pleasing to see that the teaching group was able to out perform the control group in the post test. It is encouraging to see an obvious difference in gains when comparing the two groups, considering there was only one student in the teaching

group who failed to improve as compared to three students in the control group.

Discussion

When stopping to reflect on this research project there are many aspects that come to mind that need to be considered.

When the explicit teaching commenced the majority of the students in the teaching group were very slow to understand what was being taught. One student in particular, student 8 was able to initially out perform the others but results show that he entered into the project with higher questioning skills. Many of the other students had limited questioning skills and it took some time for them to move from using words such *as, could, do, should* and *is* to concentrate more on using words such as *when, where, who, what, why and how.*

A change began to emerge as the teaching sessions progressed. Students were becoming familiar with the open question word starters and were beginning to make links with their own knowledge and with words in the text. As the students became more involved, the ability to use the questioning skill began to draw on other comprehension skills such as visualisation and vocabulary knowledge. To be able to talk to the text some students needed to imagine the topic or idea they were reading about in order for them to formulate an appropriate question. The students who were the more visual learners needed to make this visual connection so that they could question what they were reading. Some students were strong in this area and could visualise and others could not. Texts were chosen to match the instructional reading ability of the students but there were occasions when their ability to question was challenged by some unfamiliar vocabulary. Some children did not have strategies in place to be able to clarify these words. In addition to this there were times when the task was to match a question to the text and there were no directly linked words in the question to match the text. This called on the understanding of synonyms and the ability to use them to match a word in the text with a similar one in the question. Student 8 was the only one who had this skill in place and was able to use it. The others struggled during these times. This problem supports the thinking behind the teaching sequence of reading and comprehension strategies as documented by John Munro in, "Creating a Strategy Schedule." It is suggested that vocabulary, visualising and the use of synonyms all be taught prior to questioning as they provide the necessary scaffolding to assist the student to acquire the higher order skill of questioning.

Towards the completion of the questioning unit the students were beginning to make some very significant observations. They started to notice that *what* questions were most common and *who* questions often gave an answer about a person. As paragraphs were introduced the task became more complex for some students as there was more

information to take in and consider. They needed to be reminded to look at the whole paragraph rather than the first or last sentence and think about what information the text was giving and this called on knowledge of concepts and topics. Students 5 and 6 found it difficult to link two or more concepts in a network. They had difficulty linking ideas that were read early in the text to ideas that came later. This indicated possible direction for further learning that would involve teaching the skills of summarising and predicting. Within the teaching sessions there was focus on knowledge of key words as well as the ability to use the text structure to identify the topic of a text. For some students this teaching will need to be more explicit in future learning.

The research conducted by (Miller & Pressley, 1989) suggest that the student in the middle years has more automatic word processing skills in place and is therefore developmentally more ready to take on the skill of questioning. After completing the teaching sessions to develop the skills of questioning I would add to this thinking. There is no doubt that students in the middle school are more developmentally ready to take on the skill of questioning but would be greatly supported to be able to do this if the skill of questioning was introduced in the earlier years of schooling. Accepting the thinking that students in the junior years would find questioning too complex and it would compete with and distract them from word and sentence decoding, questioning could be and should be introduced to them orally. This would add to their development in oral language and provide them with a sound foundation on which to build in the middle years. The students in the teaching group would have found this strategy less complex if they had been exposed to the skill of questioning orally in their earlier years of schooling and were familiar with some of the good questioning language and open word starters.

A factor that could have had some impact on the final comprehension testing results was that the children were administered a fiction Torch Test earlier in the year. It was decided to use those results because they were fairly recent rather than administer another Torch Test. To keep the Torch Tests matched another fiction text was chosen for the post test. The questioning unit was based solely on non fiction text and this could have affected some students and their ability to apply the strategy to what they read. Some students could have possibly performed more effectively if they were to apply the skills taught to them when reading an information text. Having said this, one of the objectives of the teaching unit was to teach students to use the questioning strategy when reading any text type. Fiction text does place different demands on the reader when compared to non fiction and a goal for future learning would be to revisit the questioning strategy with the teaching group using narrative text as the focus.

This research supports the hypothesis that questioning will improve the comprehension level of students but Litwiller Lloyd (2004) notes

in research that to focus on one strategy undermines the integration of the other strategies. It is important for readers to link strategies and use each of them entwined to gain meaning from a text. Questioning is an important comprehension strategy for students to learn but works best when students can use it with a variety of comprehension strategies.

To support students in their development to become effective questioners of text we as teachers need to become better models. Hervey (2004, p. 69) argues that "If we want our students to ask searching questions, we need to be thoughtful about the kinds of questions we model." The challenge for teachers is to develop and improve their own questioning skills and when this happens students will be encouraged to think and reflect on a deeper level.

The results showed that students in both the teaching and control group improved in their ability to question. The challenge still remains to get students to apply this strategy to reading automatically and independently whenever they read, wherever they are, at school or at home. Now that the explicit teaching unit has been completed it has been encouraging to note students from the teaching group who now display more interest in reading. One student's mother remarked on how her son chooses to read now as compared to a lack of interest before. Watching these students read in focus teaching groups has been encouraging as they have become more reflective and take the time to compose a question by choosing their words more carefully. Good teaching will need to continue to support these students and bring them to a level of high reading and comprehension skills. The task of teaching good life long comprehension skills to students is not over, only part of the way on its journey.

"Learning does not lead development but creates it as children progress through various cognitive zones of development. The zone of actual development is a level of independence, what the child can do on his or her own without assistance" (Vygotsky, 1978; cited in Diehl)

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