

**THE EFFECT OF  
TEACHING PREDICTING AND VISUALISING  
STRATEGIES ON UPPER PRIMARY STUDENTS  
WITH READING DIFFICULTIES:  
*A Study Of Accuracy, Fluency And Comprehension***

## **ABSTRACT**

Reading comprehension, understanding of what is read, is traditionally assessed after the process of reading has taken place. This study focussed on four students who have participated in the Reading Recovery program and other intervention strategies, during the early years of schooling and continue to have reading difficulties. All are in a Grade 5/6 composite with twenty-one Grade 6 students and five Grade 5 students.

All students self-efficacy in regards to reading was poor and they had difficulties with fluency, accuracy and comprehension when reading.

This study pre-tested students in these areas, developed an intervention program focussing on the teaching of predicting and visualisation skills, and then post-tested students. The intervention program was based on the Think-along and Think-aloud theories developed by Beth Davey (1983) and further developed by Roger Farr (2002).

The findings of this study indicate that *Teaching students to identify and verbalise the use of predicting and visualising strategies, will improve their comprehension and fluency of read texts.*

## **INTRODUCTION**

Throughout the last five years, the teaching of reading in Victorian Primary Schools has focussed on developing foundational skills that emphasise literal understanding and word recognition. Initiatives such as CLaSS (Children's Literacy and Success Strategy), Reading Recovery Programs and the Early Years Projects have enable readers to more successfully decode text, but as students move through the primary years it is becoming more evident that students with reading difficulties do not comprehend what they are reading effectively. Word de-coding skills are of course essential to the reading process. Pressley (2000) describes word-decoding skills as the first step in developing good comprehenders of reading. Instruction regarding comprehension is also evident in these current initiatives.

Pressley further suggests that good readers are extremely active as they read as they rely on a variety of strategies to comprehend what they are reading. These include, generating questions about ideas in text while reading as well as constructing mental images representing ideas in text. Beth Davey and later Roger Farr outline this process as Think- Aloud and Think-Along strategies respectively.

An earlier study based on classroom observation, review of curriculum guides, and analysis of teacher manuals by Dolores Durkin (1981) indicated that schools in the United States were not teaching reading comprehension at all. Durkin found that these schools were continually testing reading comprehension and labelling it as instruction.

Munro and Munro (1994) suggests that for students to effectively “catch” reading textual information must be processed simultaneously at a number of levels as outlined in the MLOTP, Model Level of Text Processing (Munro, 2002). This model is based on the concept of parallel processing. Meaning that readers process text in a number of ways at a number of different levels simultaneously. These levels include; word level, sentence level, conceptual level, topic level and dispositional level. It also takes into account the use of management and control strategies, existing knowledge and sensory input.

During the past five years both teacher education and developed programs in Victorian Primary Schools have focussed on the initial levels of this model, word, sentence and some self-management strategies. Our students generally know the processes involved in decoding words and therefore can “bark” at the text presented. But how many of our poor upper primary readers can actually comprehend what they are reading? As students move through the upper primary level it is evident that some students do not comprehend or comprehend poorly what they are reading.

Current research indicates that our struggling students do not read well and that few are critical or thoughtful readers. It is evident that many students in middle and upper primary classes can decode text effectively but have difficulty understanding the concepts or links presented.

Reading comprehension, the understanding of what is read, is traditionally assessed after the process of reading has taken place. This is described by Hornsby, Sukarna and Parry (1986) as memory of comprehension. Hornsby, Sukarna and Parry suggest that reading comprehension and intervention should take place during reading.

“Comprehension as a process is an elusive entity. It is what happens to readers as they read.” (Pearson and Johnson, 1978, pp 5 as in Hornsby, Surkana and Parry, 1986, pp 98)

Reading comprehension is a constant act that requires readers to predict what a text may be about, and develop and change these ideas as more information is discovered. Therefore being able to visualise text is imperative. For students to understand what is being read they must be able to create a picture in their mind and encode textual information that changes, clarifies and develops these images. Through this study it was discovered that some students did not know that they were allowed to change their pictures. They believed that once they had formed a picture in their mind that the text will adapt to them, rather than their pictures or images being constantly modified as new information and concepts unfold. Readers also bring their prior knowledge and experience to text. The fact that they may not develop the same image as another when reading needs to be explicitly taught to some students. “We build understanding by engaging in a series of recursive interactions between what is in our head and what is on the page or screen...Each of us prints our own personal stamp on every act of reading we undertake.” (Ministry of Education, 1996, pp 22 & 24)

Strategies as described by B. Davey (*“Think Aloud: Modelling the Cognitive Processes of Reading Comprehension.” Journal of Reading, 27 (1), 44 - 47*) encourage teachers to model the metacognitive process involved in gaining meaning, strategies for answering questions as well as strategies for word recognition.

The present study aims to investigate the influence of the explicit teaching of visualisation and “think-along” strategies on reading comprehension in four grade five

and six students. Prediction: *Teaching students to identify and verbalise the use of predicting and visualising strategies, will improve their comprehension and fluency of read texts.*

## **METHOD**

This study uses a case study OXO design in which comprehension and reading fluency are monitored following predicting and visualising teaching for upper primary students.

The four participants were chosen as they demonstrated lower than average comprehension skills as evident from assessment using the *Torch: Comprehension Test* (Mossenson, Hill & Masters, 1987). All are in Grades 5 or 6 at a Melbourne suburban school in a high socio-economic area.

Each student was pre and post-assessed using the *Neale Analysis of Reading Ability: Revised. Part A and B* (Neale, 1988). It was assumed from norm information that the Neale text level chosen for both tests was at a suitable readability level for Grade 5 and 6 students.

All students have received intervention and reading support as a withdrawal program for the past four to five year. All students have been participants in the Reading Recovery program. All students are reading above level 28 but often display a difficulty in understanding the texts that they are reading. Students T and J are in Grade 6, students K and N are in Grade 5. All students are in a Grade 5/6 composite with 21 grade 6 students and 5 Grade 5 students.

All students self-efficacy in regards to reading is poor. One student described their reading as “bad, very, very, very, bad” (Student J). All students do not enjoy reading but do enjoy being read to.

Six teaching sessions of approximately twenty minutes were presented in a small group during the class literacy block. Students were not removed from the classroom and worked with the class teacher.

Each session followed a similar lesson sequence based on B.Davey’s Think-aloud approach as outlined in “First Steps Reading Resource Book”, Education Department of Western Australia, 1994 (191-192) and used resources from Reciprocal Teaching Kit (Appendix B) Each session was divided into the following nine steps:

1. Revise previous session and vocalise strategies learnt. Ask questions such as “Have you used this strategy? How has it assisted your reading?”  
*(Sessions 2-6 only)*
2. Introduce text for session and make predictions about the text. Students explain how and why they are making these predictions. Predictions are written and shared
3. Students take 1 minute to quickly sketch ideas, using only one colour, which they think may be presented in the text (session 1-3). Students draw a predictive picture in the first box of story map sheet (sessions 4-6) Students are invited to share and discuss their picture(s).
4. Group discusses background knowledge that may have influenced predictions. Teacher asks, “What do you know about this topic that may have influenced your prediction?”

5. Students begin reading text silently to given point. Eg: read to page 2 of the text. (Teacher may listen to individuals read aloud at this time)
6. Students revisit their picture and make any changes or additions using a different colour (sessions 1-3). Students draw new image, or amended image, in the next box of their story map sheet (sessions 4-6).
7. Repeat steps 5 and 6 until text or section is completed
8. Guided discussion on changes that were made to predictions, “What did you change? Why did you change it? What clues were you given in the text?”
9. Students identify metacognitive processes that assisted them. Teacher asks; “What did you see in your head? What changes did you make to your mental picture(s)?” Students identify and vocalise one strategy that they will focus on when reading at a later date and how they will do this. Students practise with their own chosen text.

Sessions one, three and five used a non-fiction text whilst sessions two and four used a narrative text. Session six used a non-fiction text written as a narrative. Texts used were from the Book Web Series. The teaching method and resources are outlined further in Appendix A.

At the completion of teaching the unit students were retested using the *Neale Analysis of Reading Ability: Revised. Part B* (Neale, 1988). The results are outlined and discussed below.



## **RESULTS**

Each students reading comprehension, accuracy and reading rate were calculated using the Neale (1988) as pre and post test scores as shown in Table 1.

**TABLE 1**

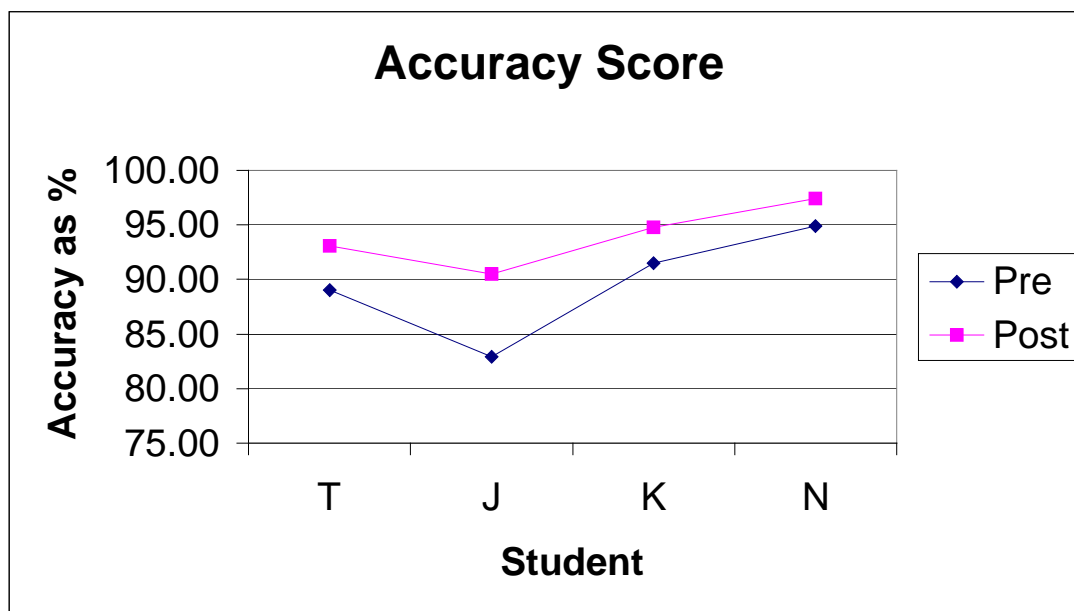
	Accuracy Score as percentage			Fluency Rate words per minute			Comprehension score as percentage from a possible 8		
	Pre	Post		Pre	Post		Pre	Post	
<b>T</b>	89.00	93.10	+2.1	45.00	60.00	+15	12.50	50.00	+37.5
<b>J</b>	82.91	90.50	+7.59	26.00	40.10	+14.1	37.50	87.50	+50.0
<b>K</b>	91.50	94.80	+3.3	39.40	48.25	+8.85	25.00	87.50	+62.5
<b>N</b>	94.90	97.40	+2.5	60.00	65.70	+5.7	37.50	25.00	-12.5

Students' assessment tasks are shown in Appendix E.

The average reading rate of all students increased by 10.91 words per minute. The average reading comprehension score improved by 34.37%. The average reading accuracy improved by 4.37%. Results indicate that the initial hypothesis is supported.

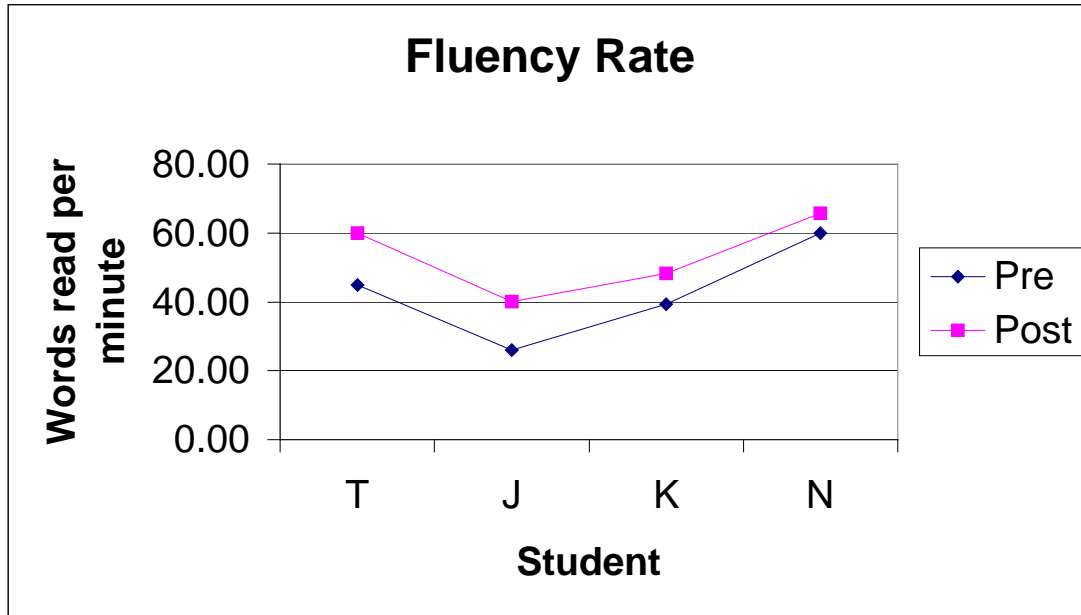
Comparisons of pre and post test scores for individual students is shown in Figures I, II and III.

FIGURE I

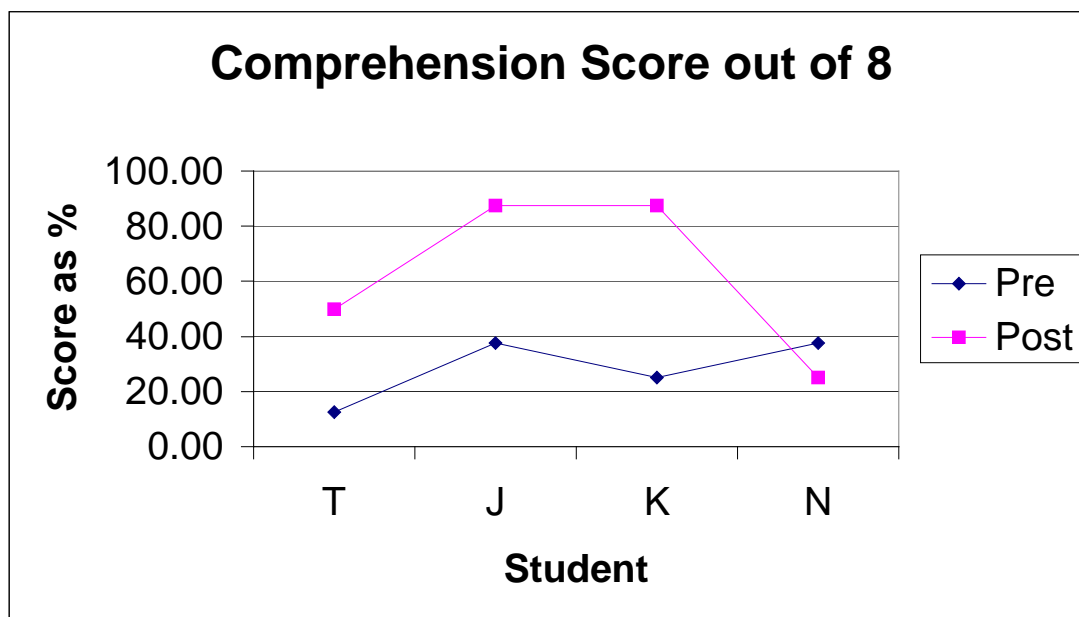


All students' reading accuracy improved after intervention. The largest biggest increase was student J. Student J's accuracy improved by 7.59%. Decreasing the level of text difficulty from hard to instructional. The smallest increase was Student N. Student N's accuracy improved by 2.5%. This decreased the level of text from instructional to easy. These results indicate that the teaching of predicting and visualisation skills improves reading accuracy.

FIGURE II



All students' reading fluency rate improved after intervention. The largest increase was Student T. Student T's fluency improved by 15 words per minute. The smallest increase was Student N. Student N's fluency improved by 5.7 words per minute. These results indicate that the teaching of predicting and visualisation skills improves reading fluency.

**FIGURE III**

Three out of the four students comprehension scores improved after intervention. The largest increase was Student J. Student J's comprehension score improved by 62.5%. Student N's comprehension decreased by 12.5%. These results may indicate that the teaching of predicting and visualisation skills improves reading comprehension. The discrepancy with student N's results are discussed further in a later section.

Trends indicate that all students benefited from this intervention. These results indicate that the explicit teaching of predicting and visualising strategies, will improve student's fluency of read texts and may improve their comprehension skills.

## **DISCUSSION OF RESULTS**

All students' accuracy and fluency of read text improved. This indicates that explicitly teaching predicting and visualising skills does improve these areas. Three of the four students' comprehension scores improved. This indicates that the explicit teaching of predicting and visualising skills may improve a student's comprehension of text.

### **Student T**

Student T is a ten-year-old female in Grade 6. Student T's results indicate that she benefited from all areas of this intervention. When beginning this study T's self image as a reader was very poor. She often found it difficult to follow written instructions and described herself as a bad reader although she enjoyed being read to. Student T participated in 5 of the intervention sessions.

Student T's reading accuracy on the pre-test was poor with a score of 89%. This indicates that the text, which is described in the Neale Analysis as suitable for 10-year-old students, was in fact difficult for this student.

After intervention, which student T actively participated in, Student T's accuracy score improved by 2.1%. Her reading fluency improved by 15 words per minute and her comprehension score improved by 37.5%.

Student T's comprehension score had the greatest increase of each of the assessed skills. Student T noted during the first session that she did not know that you could

change the picture in your head as you read and that rather it needed to remain static after the initial prediction. Student T's prediction skills improved as she was more likely to use information as described on her predicting bookmark (Appendix B) as the sessions progressed. Her initial prediction focussed only on the picture on the cover of the book. As sessions progressed she used title, genre and other read information to assist her to constantly change her prediction and the images in her head.

Student T's self-efficacy and reading behaviour have both evidently changed since this intervention. She now sees herself as a "good movie maker" and enjoys reading stories more.

### **Student J**

Student J is a 12.5-year-old male currently in Grade 6. Student J has received constant reading intervention since beginning school and repeated Prep. He has participated in the Reading Recovery Program and has had small group withdrawal intervention each year. Student J participated in all six of the intervention sessions.

Student J's view of himself as a reader is poor. "I am a bad reader. Very, very bad" Student J "loves" being read to and particularly likes adventure and fantasy stories. His mother reads to him each night and has noted that during this intervention program, Student J became more independent and wanted to read parts of the books aloud to his mother. He is currently reading "The Hobbit". Student J has a good understanding of strategies to de-code words but as his accuracy score shows his attempts are often words that do not correlate with the rest of the story and he loses the meaning.

Student J's results indicate that he benefited from this intervention with improvements in all assessed areas. Student J's accuracy score improved by 7.95%, his fluency improved by 14.1 words per minute and his comprehension of read text improved by 50%.

Student J has indicated a reluctance to read aloud to others, as he believes his reading rate is slow. Interestingly, the most evidently effected result for Student J is his fluency rate. During the pre-test reading Student J took 4 minutes 28 seconds to read the text, his post-test time was 2 minutes 52 seconds. Improving his ability to read approximately 115 words by 1 minute and 36 seconds. Student J commented at the completion of the reading "That was really quick." After this intervention Student J often asks to read aloud to the class.

Student J's comprehension score increased by 50%. He stated early in the intervention program that he did not make any pictures in his head whilst he read, but did when Mum or others read to him. Initially he described the pictures that he did make as still and later as similar to an old silent movie with music playing as well.

### **Student K**

Student K is a 9-year-old female in Grade 5. Student K suffers from hearing problems and often cannot hear instructions when in a large group. She has been involved in reading intervention programs since Grade 2. She says that she finds reading difficult, as she doesn't know what some of the words mean. Student K participated in all six of the intervention sessions.

Student K's results indicate that she benefited from all areas of the intervention. Student K's accuracy score improved by 3.3%, her fluency rate improved by 8.85 words per minute and her comprehension score improved by 62.5%. The greatest of the results being her comprehension score. Student K noted early in the intervention that she did not make pictures in her head when she or others read. She also noted that she only used the pictures to predict what the text may be about and did not use supporting pictures only the cover. Her predictions in early sessions were not consistent with the genre, title or often the supporting pictures contained within the text. She also initially did not change her predictions even after discussion with the group where others explained their own ideas.

Student K was reluctant to be involved in this intervention program but as sessions progressed began asking when they were going to be doing reading. She became more willing to participate in discussions and became more confident and accurate with her predictions and responses. Student K was able to complete activities with more accuracy as sessions continued (Appendix D).

### **Student N**

Student N is an 11-year-old male who is currently in Grade 5. He has participated in intervention programs since Grade 2 as well as Reading Recovery. Student N was absent for a number of sessions and only participated in session one, three and six.



Student N's scores indicate an improvement in the areas of accuracy, 2.5%, and fluency, 5.7 words per minute.

Student N's comprehension score decreased by 12.5%. This may be due to the fact that Student N participated in sessions one, three and six only. During session one and three a non-fiction text was used whilst in session six a non-fiction text written as a narrative was used. As the test piece was a fictional narrative this may have impacted on this result. During sessions one and three, the group were introduced to the processes of predicting (session one) and visualising (session three). During sessions two and four students were given the opportunity to practise, discuss and utilise these skills. As student N was not present at these sessions he may not have had an equal opportunity to automatise these skills resulting in a decrease in his comprehension score.

### **FURTHER DISCUSSION**

These results indicate that the use of teaching practises as described by Davey (1983), Farr (2002) and Munro & Munro (1994) is beneficial to students in developing accuracy, fluency and comprehension skills.

It is also evident that developing these skills increases students image of himself or herself as a reader and develops self-efficacy skills.

As both predicting and visualising skills were taught it would be beneficial for further studies to focus on one of these skills. Was it the predicting or visualising that assisted readers? Another variable that was not assessed by this study was the self-talk that occurred. Did the development of these skills assist students?

As sessions did not occur on a regular basis it was difficult to ensure that all students were always present, however this is how a real classroom works.

One of the benefits of this study was that it was held in a classroom with thirty-two students all completing activities simultaneously as a part of their regular literacy block. This indicates that any classroom teacher wishing to develop these skills can do so as a part of the normal class routine. The improvement may have been greater if the setting had been more solitary but indications are that this is not essential for improvement.

Although this study suggests the potential influence of the teaching visualisation and predicting strategies on reading behaviour, a more extensive and longer study, using a statistically significant number of students, from a broader sample and a control group, would need to be necessary to validate these preliminary findings.

These results support the initial hypothesis that: *Teaching students to identify and verbalise the use of predicting and visualising strategies, will improve their comprehension and fluency of read texts.*

This study supports the suggestion by Hornsby, Sukarna and Parry that reading comprehension and intervention should take place during reading. Early studies as described also discuss the importance of self-management skills such as predicting and visualising as a part of the reading process. This study indicates that class teachers are able to improve these aspects in poor readers as a part of the normal class routine.

The lower level of achievement by Student N indicates that for this intervention to be most beneficial all milestones must be reached before teaching a new sequence in the program.

An interesting discovery of this study was that students do not necessarily visualise text as they read, as was assumed by this researcher. This highlights the importance of explicitly teaching these skills to improve accuracy, fluency and comprehension for some readers who display difficulties.

## **REFERENCES & FURTHER RESOURCES**

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### **On Line Resources**

- Dade-Munroe Teacher Education Centre, *Reciprocal teaching*, retrieved May 2002 from the World Wide Web:  
[http://www.dade.k12.fl.us/pers/prodev/reciprocal\\_teaching.htm](http://www.dade.k12.fl.us/pers/prodev/reciprocal_teaching.htm)

## APPENDIX A

### TEACHING FORMAT



Each lesson followed the plan below:




1. Revise previous session and vocalise strategies learnt. Ask questions such as “Have you used this strategy? How has it assisted your reading?” (*Sessions 2-6 only*)
2. Introduce text for session and make predictions about the text. Students explain how and why they are making these predictions. Predictions are written and shared
3. Students take 1 minute to quickly sketch ideas, using only one colour, which they think may be presented in the text (session 1-3). Students draw a predictive picture in the first box of story map sheet (sessions 4-6) Students are invited to share and discuss their picture(s).
4. Group discusses background knowledge that may have influenced predictions. Teacher asks, “What do you know about this topic that may have influenced your prediction?”
5. Students begin reading text silently to given point. Eg: read to page 2 of the text. (Teacher may listen to individuals read aloud at this time)
6. Students revisit their picture and make any changes or additions using a different colour (sessions 1-3). Students draw new image, or amended image, in the next box of their story map sheet.
7. Repeat steps 5 and 6 until text or section is completed
8. Guided discussion on changes that were made to predictions, “What did you change? Why did you change it? What clues were you given in the text?”
9. Students identify metacognitive processes that assisted them. Teacher asks; “What did you see in your head? What changes did you make to your mental picture(s)?” Students identify and vocalise one strategy that they will focus on when reading at a later date and how they will do this. Students practise with their own chosen text.

Texts used were from the Book Web series:

Session	Focus text	Objective	Session	Focus text	Objective
1	Non-fiction	Introduction of Predicting skills as outlined on bookmark	4	Fiction	Reinforcement of Visualising Skills
2	Fiction	Reinforcement of Predicting Skills	5	Non-fiction	Reinforcement of Predicting and Visualising Skills
3	Non-fiction	Introduction of Visualising skills as outlined on bookmark	6	Non-fiction written as Narrative	Reinforcement of Predicting and Visualising Skills

## APPENDIX B

TRAIN YOUR BRAIN TO READ BOOKMARK	
 <p>PREDICTING</p>	<p>Make a PREDICTION when:</p> <ul style="list-style-type: none"> <li>• a title is given</li> <li>• headings are provided</li> <li>• the author poses a question in the text</li> <li>• the text suggests what will be discussed next</li> </ul> <p>Prediction stems:</p> <ul style="list-style-type: none"> <li>• Based on the title, I predict this is going to be about...</li> <li>• I already know these things about the topic/story...</li> <li>• I think the next chapter/section will be about...</li> <li>• Based on... (a clue), I predict...</li> <li>• Based on what ___ said/did, I predict...</li> </ul>
 <p>QUESTIONING</p>	<p>Ask TEACHER-LIKE QUESTIONS:</p> <ul style="list-style-type: none"> <li>• Who is ___?</li> <li>• What is/does ___?</li> <li>• When is ___?</li> <li>• Where is ___?</li> <li>• Why is ___ significant?</li> <li>• Why does ___ happen?</li> <li>• What are the parts of ___?</li> <li>• How is ___ an example of ___?</li> <li>• How do ___ and ___ compare?</li> <li>• How are ___ and ___ different?</li> <li>• How does ___ happen?</li> <li>• What is most important ___?</li> <li>• What is your opinion of ___?</li> </ul>

 <p>CLARIFYING</p>	<p>CLARIFY hard parts when:</p> <ul style="list-style-type: none"> <li>• you don't understand</li> <li>• you can't follow the text</li> <li>• you don't know what a word means</li> </ul> <p>Clarifying stems:</p> <ul style="list-style-type: none"> <li>• I don't really understand...</li> <li>• A question I have is...</li> <li>• A question I'd like answered by the author is...</li> <li>• One word/phrase I do not understand is...</li> </ul>
 <p>VISUALIZATION</p>	<p>VISUALIZE a picture in your mind:</p> <ul style="list-style-type: none"> <li>• When I read this, I imagine that...</li> <li>• As I read, in my mind I see...</li> </ul>
 <p>SUMMARY</p>	<p>How to do a SUMMARY:</p> <ul style="list-style-type: none"> <li>• Look for the topic sentence.</li> <li>• Look for who, what, when, where, why, and how.</li> <li>• Omit unnecessary information.</li> </ul> <p>Summary Stems</p> <ul style="list-style-type: none"> <li>• This story/paragraph is mostly about...</li> <li>• The topic sentence is...</li> <li>• The author is trying to tell me...</li> </ul> <p>A framed summary sentence: This story/passage about ___ begins with ___, discusses (or develops) the idea that ___, and ends with ___.</p>

Reciprocal Teaching Bookmark from: Dade-Munroe Teacher Education Centre, *Reciprocal Teaching*, retrieved May 2002 from the World Wide Web: [http://www.dade.k12.fl.us/pers/prodev/reciprocal\\_teaching.htm](http://www.dade.k12.fl.us/pers/prodev/reciprocal_teaching.htm)

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