ABSTRACT

Many students have a problem with the explicit use of comprehension strategies to help them understand a text. This study hypothesizes that if we train students to use the visualizing strategy when reading there will be a measurable improvement in their comprehension of fiction texts.

This study observed four students in Year 2 who were known to have reading comprehension difficulties. They were exposed to the visualizing strategy. Their comprehension skills were then measured with the PROBE Test pre and post intervention.

The strategy proved to be successful. This implies that teachers should use the visualizing strategy as an integral part of any reading comprehension program.

INTRODUCTION

Researchers have suggested a number of ways of improving students' comprehension skills. "One of the most perplexing problems educators face is how to help children to develop strategies that will facilitate comprehension." (Gambrell and Bales, 1987, p.147)

Of the strategies available to educators, one of the more popular appears to be visualizing. Visualizing is "imagining or 'making pictures in the mind' of what is being read and aims at promoting active processing and organization of text propositions to enhance comprehension and recall." (Chan, Cole and Morris, 1990, p.3)

Unfortunately, a common problem is that some students have difficulty using the visualizing strategy to assist them in comprehension. Students with this disability are often characterized as inactive (Torgesen, 1977 and 1982) and passive learners unaware of, and unable to initiate the skills required to undertake the task of comprehension. "[T]hese students are often unaware of the appropriate cognitive strategies that facilitate

task performance and cannot efficiently initiate, regulate, and monitor the use of such strategies." (Chan, Cole and Morris, 1990, p.2)

Support for the visualizing approach is mentioned by Pressley (1976), and also by Gambrell (1982) who noted that "children as young as 8 years were successful at employing visual imagery to increase reading comprehension after only 20 minutes of training." (See also Gambrell and Bales, 1987, p. 149) Similar support comes from Chan, Cole and Morris who state - "Explicit visualization instruction in conjunction with supported imagery by means of pictorial aids facilitated the comprehension performance of students with reading difficulties." In summary, the research suggests "that mental imagery is a strategy which can play an important and positive role in the listening, reading and writing comprehension of elementary age children." (Gambrell and Bales, 1987, p. 147)

Accordingly, this paper reports an empirical experiment utilizing the visualizing strategy to determine whether the concept has merit in a localised setting. Specifically, the visualizing strategy was employed using four students over eight days.

The following hypothesis was tested -

> A measurable improvement in comprehension skills will be detected following the use of the visualizing strategy.

METHOD

The study used a model of ATA (Assessment-Teaching–Assessment) design. Gains in reading comprehension were monitored following the teaching of the visualizing strategy to four Year 2 students with reading comprehension difficulties.

The students had a relatively high level of decoding skill but exhibited a corresponding low level of comprehension. This area of learning has been identified as important after a review of pre-test and post-test CLaSS (Classroom Literacy and Success Strategy) results 2001/2002 (see Appendix One). At the beginning of the 2002 school year

analysis of these results showed a high number of Level 28+ readers. When tested incidentally and formally, many of these students produced a considerably lower comprehension score compared to their reading level. Readers were also more likely to comprehend text literally, but rarely on other comprehension levels.

> "Initially comprehension for us was about literal understanding of stories and narrative text. And, of course, this remains one goal of reading comprehension instruction. But this is only one goal. True comprehension goes beyond literal understanding and involves the reader's interaction with text. If the students are to become thoughtful, insightful readers, they must extend their thinking beyond a superficial understanding of the text." (Harvey and Goudvis, 2000, p.8)

Students A, B, C and D were selected after a review of their most recent Running Record. These records showed a higher number of meaning errors and visual self-corrections. Teacher/student dialogue was also monitored and observations recorded during comprehension activities.

> "Although much comprehension occurs implicitly, unconsciously, and almost automatically, much of the comprehension involves the conscious, active processing of text. The good reader can be active before reading (e.g. over viewing text and making predictions), during reading (e.g. updating predictions, constructing mental images), and after reading (e.g. constructing summaries, thinking about which ideas in text might be useful later). Good readers are both interpretive and evaluative, often relating to the validity of the ideas in text." (Pressley, 1998, p.55)

Each of the students had a history of developmental problems in reading. Student A was on the Reading Recovery Program (1st intake) for 20 weeks. Student B was on the tentative selection list (1st and 2nd intake). Students C and D had regular parent/teacher meetings to monitor literacy progress. (See Appendix Two for Student Information Grid for additional information).

The materials used for the formal pre- and post-testing was the PROBE (Prose Reading Observation, Behaviour and Evaluation of Comprehension) reading and comprehension test. PROBE is an Informal Reading Inventory that combines evaluation of reading accuracy, reading behaviour and in-depth reading comprehension. It was designed and written by a team of specialist education practitioners who have worked in both Australia and New Zealand. Their experience in reading assessment and analysis led them to recognize that a high level of reading accuracy did not necessarily correlate with a corresponding depth of understanding. Each level of text has been purpose written as an assessment tool and the reading age has been largely determined using the Elley Noun Frequency Method (Elley and Croft, 1989), with some cross-checking using the Fry Readability Formula (Modified).

The term 'successful' in relation to the use of PROBE is determined by a scoring rate of 95% in decoding (generally considered an independent reader at this level) and a minimum of 70% scoring rate in comprehension (indicating that the student has grasped the main points and details of the text).

Selection of the entry point to PROBE was determined by Student A, B, C and D's last Running Record that scored 'Easy" (95%+). This was then correlated to the PM Benchmark Kit – Reading Levels and Reading Ages Grid. The corresponding text was chosen. The test was administered in the following way –

1. Students were told this was a test to determine how well they could read

2. Students were told they could read the story to themselves. They were then asked to read it aloud and to answer some questions about the story. It was made clear that the answers to the questions may not always be apparent, but that they would be in the text. They could look back at the text – it was not a memory test.

3. Students were given the text to read silently, then asked to read aloud at their own speed.

4. A Running Record was completed and their reading behaviours observed and recorded.

5. Pre-set comprehension questions were read to the students and each response was recorded. Prompts were given if re-focusing or further elaboration were needed.

The post-test used an identical process, with entry point being determined by the same method.

Assessment pieces were collected throughout the teaching process in the form of drawings. These drawings were part of the lesson process and were a record of the student's visualizing and re-visualizing attempts. Each of the drawings was annotated and used in the overall analysis of results (see Results section for further explanation).

The "the gradual release of responsibility" model of intervention was used to directly instruct students (Pearson and Gallagher, 1983). This model requires the student to use the visualizing strategy independently if and when it is needed. Fielding and Pearson (1994) have identified the following four components of comprehension strategy instruction to be used with the model.

1. Teacher modeling. The teacher explains the strategy, demonstrates how to apply it successfully and thinks aloud to illustrate the mental processes used when visualizing

2. Guided practice. After explicit modeling, the teacher gradually gives the student more responsibility for task completion. The teacher and student practice the strategy together with the teacher scaffolding the student's attempts. The student shares their thought process with other students during small group discussions.

3. Independent practice. After working with the teacher and other students, each student attempts to apply the strategy on their own. The student receives regular feedback from the teacher and other students.

4. Application of the strategy in real reading situations. The student applies the now clearly understood strategy to a new piece of text. Each student then demonstrates the effective use of the strategy on a higher graded text.

The gradual relinquishing of responsibility by the teacher is vital to the use of the visualizing strategy - "[t]eacher dialogue is very important to provide feedback about the image and to ask contrast questions in order to stimulate choices and to clarify the speaker's descriptions" (Love and Reilly, 1997, p.36). Moreover, Chan, Cole and Morris (1990, p. 10) note that "adequate time and practice are necessary for mastery of the [visualizing] strategy. In addition, appropriate gradual fading of external support is critical to promote internalization and generalization of strategy use."

Eight sessions were conducted over consecutive days. Each session was a ½-hour in duration. The first four sessions focused on using the strategy without applying it to text. They were structured so that the four students worked in pairs. This endeavored to make the introduction of the visualizing strategy as distraction free as possible. Evidence suggests that when students experience internal and external distractions it is difficult for them to employ strategies and attend to tasks. It is also suggested that an "inability to filter distraction is the primary factor in learning disabilities" (Zenker and Frey, 1985, p.342).

The last four sessions were conducted with the full group to make optimum use of peer modeling and scaffolding. These focused on the use of known and unknown texts. Verbalizing was strongly emphasized in the teaching process. Lifford et al (2000, p.49) suggest that verbalizing is an integral part of the visualizing strategy –

"[t]o help students, particularly younger students, figure out how to respond, we model our own thinking processes. We consider implications of the title, make

predictions, and ask ourselves questions: Who is this person? What is he like? What is he doing? Why is he acting in a particular way? We attempt to answer these questions as we learn new information. We also try to show how we connect the events in the text to the events in our own lives, to other books we have read, to the movies we have seen."

Each session moved progressively from the known to the unknown. For example, the students were asked to visualize an apple in one session and in the next a house made of chocolate. This process was repeated with pictures and texts. Students were given opportunities to pictorially represent their images and eventually apply the strategy to texts 'read to' and 'read by' themselves. This provided the students with a scaffold with which to practice the strategy, eventually "integrating the stimulus of words and pictures into a unified image." (Weed and Ryan, 1985, p. 549) As Lifford et al (2000, p. 55) suggest, "students use writing to help them understand a text. They take notes, respond in journals, write down definitions, and draw pictures…. What is apparent, though, is that better readers usually have more strategies to call upon."

A full record of the eight teaching sessions can be found in Appendix Three.

RESULTS

The students' performances are described in two sections – verbal and imagery comprehension.

The students' verbal comprehension is described in terms of comprehension scores (Literal, Inference, Vocabulary, Evaluation, Re-organisation and Reaction) pre- and post-intervention. See Table 1.

TABLE 1: Verbal comprehension scores

	Literal		Inference		Vocabulary		Evaluation		Re-organisation		Reaction		Total	
TEST	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Student A	1/1	2/2	3/5	1/1	1/2	0/1	0/1	2/3	0/1	2/2	N/A	1/1	5/10	8/10
Student B	1/1	2/2	1/5	1/1	0/2	0/1	0/1	2/3	0/1	0/2	N/A	0/1	2/10	5/10
Student C	1/1	1/1	2/3	2/3	0/1	0/1	0/1	2/3	1/2	N/A	N/A	N/A	4/8	5/8
Student D	0/1	2/2	3/5	1/1	2/2	0/1	0/1	2/3	0/1	2/2	N/A	0/1	5/10	7/8

Analysis of Table 1 indicates that improvements occurred in the following ways -

- All students showed an improved use of the Evaluation (extrapolating additional information not given in the text) level of comprehension.

- Some students showed improved use of the Re-organisation (reconstructing two or more pieces of information contained in the text) level of comprehension.

- All students maintained or improved their level of comprehension in the Literal (information that is given directly in the text) and the Inference (information implied but not given directly in the text) levels of comprehension.

- All students showed a decrease in their Vocabulary level of comprehension.

- There were not enough questions answered to detect any change in the Reaction level of comprehension.

The students' imagery comprehension was calculated by rating the extent to which each drawing accurately represented the image seen/ text heard or read. The average imagery comprehension score for each collated drawing is shown in Table 2.

TABLE 2 : Imagery comprehension scores

	Session 3		Session 4		Session 5		Session 6		Session 8	
	1st image	2nd image	1st image	2nd image	1st image	2nd image	1st image	2nd image	1st image	2nd image
Student A	2	2	2	2	2	2	2	2	2	2
Student B	1	2	1	2	2	2	2	2	1	2
Student C	1	2	1	2	2	2	2	2	1	2
Student D	1	2	2	2	2	2	2	2	2	2

Key – 1st image = 1st visualization   2nd image = 2nd visualization

0 = not many features

1 = some features

2 = lots of features

Analysis of Table 2 indicates that improvements occurred in the following ways -

- Most students in session 3 showed little detail in the 1st image but significantly more detail was shown in the 2nd image.

- Half the students in sessions 4 and 8 showed little detail in the 1st image but significantly more detail was shown in the 2nd image.

In summary, the results indicate that all students benefited from the use of the visualizing strategy. Lower level comprehension skills such as Literal and Inference were increased or maintained. More sophisticated and higher level comprehension skills such as Evaluation and Re-organization were increased. The hypothesis was found to be true. Further support for the hypothesis was found in the students' ability to transfer the visualizing strategy from a known to an unknown text/ setting.

More detailed support for the hypothesis can be found in the review of each individual student's results, behaviours and general observations.

Student A presented as an extremely fast reader who had a high number of omissions in his running record. He was very clear that he could visualize and stated in Session One that he "often daydreams". Throughout the sessions it became evident that he was poor at expressing himself verbally and consequently depended a lot on questioning to expand and express his visual images. Increases in the areas of Evaluation and Re-organisation were evident whilst he maintained a strong ability to pictorially represent his visualizations on both the 1st and 2nd attempts.

Student B was very confident about her ability to visualize. Her self-talk was positive and sustained throughout the whole intervention. She was very detailed in her verbal representations but more so pictorially and showed improvement in the Evaluation level of comprehension.

Student C started the intervention with very negative self-talk about her reading ability in general and stated on many occasions her trepidation about whether she could visualize. Many of her answers in the pre-test where premised by "maybe", which disappeared in her post-test answers. Student C exhibited visualizing behaviours such as looking up into space and sub-vocalizing parts of the story when recalling events. This showed a level of cognitive organization. This student was the most obvious of the four students when it came to visualizing. She would often go into a trance-like state when attempting to do so. Verbalization of the objects and story came quite easily and was a strength of her attempts to use the visualizing strategy. This was evident in her additions to drawings

after the second visualization. Student C was successfully able to transfer the visualizing strategy to unknown texts she had read independently.

Student D made considerable improvement in three areas of comprehension – Literal, Evaluation and Re-organisation - and was tuned into the visualizing strategy and its verbal component from the outset. His recall ability for the spoken word and visual detail was enormous and his self-talk was positive. Student D often referred back to his drawings or the story as a reference point, which seemed to enhance his understanding and application of the visualizing strategy. He made use of the written text in both the pre- and post-test assessment by re-reading and scanning to assist his comprehension.

DISCUSSION

The hypothesis was supported by the results. Working in a pair format seemed to produce a more conducive environment for instruction and implementation of the visualizing strategy. This result was consistent with Zenker and Fry (1985) who studied the filtering of distractions in learning disabilities.

However, there was variation among students. The behaviour observed when students employed the visualizing strategy differed. This difference cannot be explained objectively. It was particularly evident in Student C's improved self-talk in the pre- and post-test. It can be suggested that by providing a scaffold for strategy use and verbalizing the model, her attempts were more focused and positive in the post-test. Love and Reilly (1997) endorse this when they discuss teacher dialogue and support.

The teaching implications arising from this study are that student comprehension skills will improve if teachers model and practice the visualizing strategy in the earlier stages of student reading development. Programs such as the Catholic Education Office (Melbourne) Speech Pathology Language Program 'Visualizing and Verbalizing' (1996), should be an integral part of Prep and Year 1 literacy sessions. Further improvement of comprehension skills could be achieved in the book orientation component of a Shared

Book session by consistently modeling and using the visualizing strategy as an essential reading skill.

This study contained a number of weaknesses that might be addressed in future research. Suggested future changes include the following –

- Change the existing pre- and post-test assessment to include more Literal and Inferential comprehension questions. This would improve the validity of observed increases in these comprehension skills.

- Use alternative Literal and Inferential based pre- and post-tests. This would allow comparisons between assessment tools to indicate which was the more effective.

- Extend the number of sessions when working with known objects and texts. This would allow for extended practice of the visualizing strategy within a familiar context.

- Increase the sample size, extend the period of intervention, look at more accurate ways to collect data on the use of the visualizing strategy and its effective transfer into everyday reading practice.

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