CHAPTER 5 METACOGNITIVE INSTRUCTION

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5.1 INTRODUCTION

Given the significance of cognitive and metacognitive instruction and its possible benefits, it is important to assess how strategies can best be taught so that students will become aware of and subsequently use the strategies appropriately.

Sheinker, Sheinker & Stevens (1984) caution that before attempting to implement cognitive strategy training in a classroom, a teacher must be thoroughly versed in the aspects found by research to be effective as haphazard use may result in unpredictable and possibly negative outcomes. For this reason, the warnings of researchers (Ambruster, Echols & Brown, 1983; Anstey, 1988; Borkowski, Weyhing & Turner; 1986; Bransford & Vye, 1989; Cole & Chan, 1990; Costa & Lowrey, 1989; Conway & Gow, 1990; Cranstone & Baird 1988; Derry & Murphy, 1986; Evans, 1991; Kurtz & Borkowski, 1984; Palinscar, 1986; Rabinowitz, Freeman & Cohen, 1992; Reeve & Brown, 1985; Rowe, 1988 and others) need to be heeded if any intervention is to be successful, for although much of the research into cognitive and metacognitive strategy instruction has been promising, there continues to be persistent problems with maintenance and generalisation (Cole & Chan, 1990). As Rowe (1988) explains, two basic problems in attempts to train strategic behaviour remain evident:- (1) the induced behaviours are not always maintained after training, unless there is some external prompt to use them and (2) although metacognitive skills can be conceptualised as broad abilities cutting across tasks it is difficult to show that once a skill is trained, it generalises to other similar but not identical tasks. The researcher had been, in recent years, teaching spelling to small groups of year 4, 5 and 6 poor spellers in a withdrawal situation in the resource room. The approach was to encourage the use of a range of

strategies to improve spelling ability. Anecdotal records tend to indicate that although the students appeared to be more aware of and more confident in monitoring the use of strategies to assist spelling in the resource room, they were not always applying what they have learned to spelling/writing situations in the regular classroom.

Resnick & Klopfer (1989) argue that research has confirmed that the acquisition of skills and strategies through cognitive strategy training has at times failed to enhance students' competencies as readers, writers, problem solvers or thinkers. Students' failure to use effective strategies in which they had received training may have been due to the interplay of a variety of factors. Several reasons have been suggested in the literature for the lack of generalisation of strategy use:-

. Lack of incentive, habit or disposition to use the learned strategy (Cole & Chan 1990; Resnick & Klopfer, 1989).

. Lack of self-regulation of strategy use (Cole & Chan 1990; Resnick & Klopfer, 1989).

. Lack of understanding of the value of strategic behaviour (Kurtz & Borkowski, 1984; Rowe, 1988).

. Lack of understanding of the connection between "effortful, strategic behaviour and successful performance" (Borkowski, Weyhing & Turner, 1986, 133).

. Attentional strain caused by lack of fluency or automaticity. (Bransford & Vye, 1989).

. Lack of specific instruction to induce generalisation and transfer in the training of the strategy (Cole & Chan 1990).

. Lack of motivation to employ strategies when encountering difficulties in task completion (Cole & Chan 1990).

Several issues need to be considered before choosing or embarking on any cognitive, metacognitive strategy training program. This chapter

consequently examines the literature pertaining to techniques of cognitive and metacognitive instruction aimed at promoting strategy use, maintenance and generalisation.

Within this discussion several issues are considered:-

. Whether the training should involve direct or indirect instruction or a combination of both.

. Whether instruction should be interactive or whether time should be given for solitary practice.

. Whether instruction should take place in the regular classroom or in the resource room.

. Whether instruction in the spelling content and instruction in thinking skills should be linked.

. Whether attributional training/retraining should be incorporated into strategy training .

With specific criteria in mind, the chapter, then examines cognitive oriented approaches which have been specifically devised to address the issue of programming for generalisation in order to determine the most appropriate for the proposed study.

Before any metacognitive training intervention can be implemented there is a need to determine the student's current level of functioning. For this reason, ways of reliably accomplishing this are examined. Finally a research design to suit the interactive nature of metacognitive training instruction is sought.

5.2 DIRECT OR INDIRECT INSTRUCTION

One of the critical issues concerning the promotion of learning strategies is how they are taught, or encouraged. The main issue is whether strategies and control beliefs are taught explicitly or whether the learning situation is arranged in such a way as to increase the chances of students' discovering appropriate strategies for themselves (Evans, 1991).

Some researchers argue that training in metacognitive skills should be direct. Conway & Gow (1990, 355) argue that it is clear from research that generalisation must be programmed rather than "expected" or "lamented." Cole & Chan (1990, 263) refer to a metacognitive training program containing elements of "informed" training. To them, informed training as opposed to blind training would involve instruction in the significance of the cognitive processing activities that students are taught to engage in. In this way, students would be taught not only how to, but also when and why they should do so. This would, according to Cole & Chan (1990) promote increased awareness of the benefits of the cognitive strategy learned and the appropriate contexts in which it could be employed, and consequently allow continued unprompted use of the strategy. In advocating the inclusion of elements of self-control training Cole & Chan (1990) argue the need for the explicit training of general executive skills such as planning checking and monitoring if greater maintenance and generalisation of the learned strategies are to be expected.

Others researchers argue that training should be indirect in nature. Costa & Lowrey (1989) argue that direct instruction in metacognition may not be beneficial because when strategies for problem solving are imposed by the teacher rather than generated by the students themselves, their performance may become impaired. When students experience the need for problem-solving strategies, induce their own, discuss and practice them to the degree that they become spontaneous and unconscious, their metacognition seems to improve (Costa & Lowrey 1989).

As noted by Evans (1991), the studies of Palinscar & Brown (1986) did not use explicit teaching strategies. Rather they relied on modelling or discovery by students, who were placed in situations which actively encouraged the use of strategies. Evans (1991) believes that higher order procedures need not be taught explicitly. Tasks can be chosen so as to maximise the need to use not only higher-order procedures and executive strategies, but also to make apparent to the learner the effect of using those strategies in performance and feedback. In combination with this specially chosen tasks, teaching methods can be chosen to press for and to model effective strategies (Evans, 1991).

A middle position is suggested by many researchers. As Derry & Murphy (1986) suggest, metacognitive or executive learning skills cannot be trained easily or by direct instruction alone. They refer to ".....'engineering' the gradual evolution of important executive control skills. (Derry & Murphy 1986, 31). Costa & Lowrey (1989) suggest that for students to succeed in accomplishing an academic task and to facilitate transfer, the terminology involved in the task should be explained but that the mental processes should be actively experienced and analysed by the students.

For the purpose of the intervention study, a middle position as suggested by Derry & Murphy (1986) will be taken. The development of spelling and metacognitive strategies will not be left to chance. In the early stages of the program, the strategy instruction will be mainly teacher imposed and directed. Then gradually, through interactive instruction control will be ceded to the students.

5.3 INTERACTIVE INSTRUCTION

There is a good deal of support by researchers and theorists for the use of interactive teaching procedures in programs aimed at fostering cognitive and metacognitive skills (Cole & Chan, 1990; Derry & Murphy, 1986; Reeve & Brown, 1985).

Reeve & Brown (1985) have analysed the social origins of metacognitive skills and argue that the awareness of conscious self-regulatory activities has its roots in social interactions with others. Others in the child's developing world, initially take responsibility for articulating metacognitive processes. With time, this responsibility is ceded to the child, who is required to take charge of her or his own thinking behaviours (Reeve and Brown, 1985). For this reason, they argue that programs aimed at fostering these skills should focus on interactive teaching procedures and that the child should be regarded as a co investigator in gaining insight into his or her own metacognitive processes. The goal of the procedure is to keep the child fully informed of the purposes of the interaction and to facilitate the development of the self-control of the child's own metacognitive processes (Reeve and Brown,

1985). Derry & Murphy (1986) also refer to this social aspect in the development of metacognitive skills. In many real-life learning situations (mother and child, master craftsman and apprentice, mentor and student) the transfer of executive control passes from teacher to student due to the interactive nature of the learning experience.

Various terms have been applied to the term *interactive* teaching in the literature. Palinscar (1986) refers to *guided interactive instruction* or *scaffolded instruction* . Bransford & Vye (1989) along with Resnick & Klopfer (1989) indicate that students need the experience of *coached practice* rather than *solitary practice.* One of the most critical if not crucial aspects of interactive instruction is that of modelling by thinking aloud by the teacher or coach (Anstey, 1988; Bransford & Vye; Cole & Chan, 1990; Reeve & Brown, 1985; Silven & Vauras, 1992). The teacher uses speech or dialogue to describe the desired strategic behaviours so as to externalise the underlying thought processes; the student imitates and uses verbalisations to guide his/her own thinking processes; and gradually the speech fades from overt to covert to allow for the gradual internalisation of the verbalisations and finally to the student's gaining conscious control of his/her cognitive functioning (Cole & Chan, 1990). Think-alouds make "hidden strategies more visible and encourage a critical approach to their use" (Winser, 1988, 265). They can also serve as feedback to the teacher about the student's development. The more precisely the teacher is able to interpret the student's activities and difficulties, the more appropriate will be the feedback. As Silven & Vauras (1992) suggest, a prompt given by the teacher at the right time may arouse an insight in the student that results in a leap forward in development.

Problems have arisen, with regard to interactive instruction, about when to transfer power to the learner (Conway & Gow, 1990). In other words, it may be difficult for the teacher to know exactly when to cede complete control to the student. Cranstone & Baird (1988) suggest that the change involved in enhancing a student's metacognition takes time and a considerable amount of support since as Cole & Chan (1990) indicate over learning is required in order to achieve automaticity. Fortunately, as research suggests, this support does not always have to come from teachers. Initial support can begin with the teacher but can gradually be

handed over to others. Conway and Gow (1990) point out there is a suggestion from the reciprocal teaching work of Brown and Palinscar (1986) that another fruitful area of research lies in the co-operative learning strategies such as peer tutors, reciprocal teaching and small group teaching. Group instruction may provide some important benefits resulting from group interaction (Pearson, 1982; Sheinker, Sheinker & Stevens, 1984). The researcher, from professional experience as a Support Teacher, has discovered the benefits of group interaction in small group co-operative settings in the resource room. In the small groups, students may have been asked to write as many words as possible with the 'are' sequence of letters. In the interactive session that followed, the students were developing and further refining their spelling and metacognitive strategies by problem solving together.

5.4 RESOURCE ROOM OR REGULAR CLASSROOM

It is argued that in keeping with the inclusive schooling movement (Dalmau & Thompson, 1992) which advocates that for different categories of children to be truly included and to aid generalisation, learning strategy instruction should take place in the regular classroom. Researchers agree that to be most effective, cognitive and metacognitive strategies should be incorporated into the normal class curriculum, and not conducted in isolation by a specially trained person, such as a Support Teacher, who sees the children periodically for strategy instruction (Cole & Chan, 1990; Mulcahy, Peat, Andrews, Darko-Yeboah, Marfo & Cho, 1991). However, as Cole & Chan (1990) suggest, a Support Teacher can help by team-teaching in the classroom or by taking a particular group on a part-time withdrawal basis but where the transfer of skills is necessarily programmed for through collaboration with the Class Teacher.

For the intervention study, therefore, spelling and metacognitive strategy training will be planned around the regular classroom. The Support Teacher may team teach with the Class Teacher. The Support Teacher and/or the Class Teacher may teach the whole class, small groups or individual students and at times this teaching may be in a withdrawal situation. On the other hand, the Support Teacher may also simply act as consultant. Apart from the reasons suggested above, training in the

regular setting will also aid transfer of the use of the strategies in word study to using them in all spelling/writing situations. Further it saves a duplication of resources, both material and personnel.

5.5 EMBEDDED VERSUS DETACHED STRATEGIES

It may seem superfluous to consider such an issue when the object of the proposed study on spelling ability and metacognitive skills is to improve students' spelling ability through cognitive strategy and metacognitive strategy instruction. Naturally strategy instruction should be embedded within the content area of spelling. However, it is argued the reasons for linking thinking skills and content given by an overwhelming number of researchers and theorists are important and have significance to the present study. Many cognitive theorists and researchers believe thinking skills cannot and should not be taught apart from content because content is inseparably linked with cognition (Anstey, 1988; Cranstone & Baird, 1988; Derry & Murphy, 1986; Marzano et al, 1988; Evans, 1991; Perkins, Jay, Tishman 1993; Rabinowitz, Freeman & Cohen, 1992; Resnick & Klopfer, 1989; Rowe, 1988; SPELT, 1991). It is the linking of the instruction in the content of spelling and in the instruction of thinking skills that is important for the intervention study.

According to Rowe (1988), the objective of teaching metacognition should not be viewed as competing with that of teaching content. Resnick & Klopfer (1989) and Rowe (1988) argue that they are complementary to one another. No depth in either is possible without the other. Moreover, the principles of effective teaching of content and skills apply equally to training in metacognition. The key factors are encouragement, explanation, formative feedback and modelling on the part of the teacher (Rowe, 1988).

Derry & Murphy (1986, 31) suggest that "the strength of embedded strategies is that it forces extended practice and use of learning skills in realistic semantic context." Anstey (1988) adds that teaching students to learn how to learn in situations in which they are most likely to need to use those learning skills in the future, that is in context, aids transfer. For example, the teaching of strategies to aid spelling in real spelling and real writing situations for real purposes will aid the transfer of the learning

how to learn strategies from one situation to another. Another initiative to aid transfer is suggested by Palinscar (1986). She recommends that practice material should be compatible to that with which the student will independently apply the strategy.

A pertinent argument offered by many researchers and theorists (Cole & Chan, 1990; Marzano et al, 1988; Perkins, Jay & Tishman, 1993; Rabinowitz, Freeman & Cohen, 1992; Sheinker, Sheinker & Stevens, 1984) is that the application of a given strategy is always interacting with the accessibility of relevant knowledge and that this interaction has implications for understanding strategy use. Referring again to the similarity between metacognition and constructivism, abilities to make inferences and to generate new information could be fostered by instructional methods that insure contact with prior knowledge, which is restructured and further developed as thinking and problem solving occurs. Learning and thinking skills could be acquired as the content and concepts of a particular content area or knowledge domain are taught (Marzano et al, 1988). Although Perkins, Jay, Tishman (1993) comment that thinking draws on a highly organised, rich knowledge base in the domain in question, it is argued that the less efficient learners are not only deficient in the use of metacognitive skills but generally have a poor knowledge base from which to draw. It is believed that Gerber's (1982) work in which he sought to obtain improvement in spelling accuracy among older learning disabled students failed to have the expected results because the strategies' instruction was not supported by instruction in domain specific knowledge.

The important message for the intervention study in spelling and metacognition is that teachers have a dual agenda. They need to develop in all students a rich knowledge base, and they need to provide students with a repertoire of cognitive and metacognitive skills and strategies that will enable them to use the knowledge efficiently in meaningful contexts (Ambruster, Echols & Brown, 1983).

5.6 OTHER STRATEGIES FOR ENHANCING THE DEVELOPMENT OF METACOGNITIVE SKILLS

Much of the work done in metacognition and constructivism has ignored perceptions and attitudes. "Perceptions and attitudes are personally constructed, and these play major roles in determining whether or not the individual understands, values and uses metacognitive skills and perspectives" (Cranstone & Baird, 1988, 243). Derry & Murphy (1986, 9) argue students may know, when and how to use strategies but unless they also develop the desire to employ them, "a desire that emanates from feelings of efficacy regarding the learning skills and their potential, generalised learning ability will not improve." Learning is both cognitive and affective - if students are to become more metacognitive they must be not just *able* but willing *and able.*

Borkowski, Weyhing & Turner (1986); Evans (1991) and others recommend methods of organising training routines and methods of incorporating attributional training/retraining into strategy training in order to provide opportunities for students:- to practise important skills; to be given useful attributive feedback so that positive self-concepts are fostered; to gain increasing control over their own learning and to maintain and generalise learned strategies.

. Teachers can help students to enhance their effort through positive control beliefs about their own ability (Evans, 1991). Palinscar (1986) advocates the development of self control beliefs through the use of frequent and direct measures to evaluate the success of the instruction and students' efforts (eg. tape recording a session and playing it back at a later time). This is an important consideration for students with a history of academic difficulty. Students who are anxious and feel helpless in school are inclined to attribute success with a task to "luck" while they attribute failure with a task to their own lack of abilities. "Therefore, it is especially appropriate that these students be appraised of the merits of combining effort with strategic ingenuity as they approach school tasks" (Palinscar, 1986, 122). The SPELT program (Mulcahy et al, 1991) advocates positive self-talk techniques for focusing attention and managing anxiety and a way of diverting fears away from fears of incompetence and failure.

- Teachers can help students to see the value of being open to feedback about performance rather than being on the defensive, so as to use this feedback to increase their ability (Evans, 1991). Students need to become fully aware of the importance of strategy-based effort for successful performance (Borkowski, Weyhing & Turner, 1986). These authors suggest that the teacher models appropriate attributional statements and then overtly ascribes the student's successes and improvements to the effort expended in deploying appropriate strategies. In a peer tutoring program devised to improve reading motivation and self-esteem, descriptive praise given by the tutor was shown to not only boost self-esteem of the tutee, but to increase the tutee's use of the particular strategy praised eg. "I liked the way you went back and corrected yourself" (Smith, 1986).

- Borkowski, Weyhing and Turner (1986) believe that the initial focus of attributional retraining should generally centre on task-specific beliefs since antecedent beliefs are more resistant to change than more transient program- specific attributional beliefs. Cranstone & Baird (1988) also believe in the teacher's providing relatively rapid pay off for students who undertake the effort which metacognition demands.

- "Attribution retraining needs to be intensive, prolonged and consistent in order to combat the debilitating, negative beliefs about self-efficacy" (Borkowski, Weyhing and Turner, 1986, 135).

- "Each occasion for strategy instruction is also an opportunity for retraining attributions. This enables the instructor to enhance metacognitive and motivational processes simultaneously" (Borkowski, Weyhing and Turner, 1986, 135).

- "The centrality of the individual and the personal nature of each individual's learning must be recognised " (Cranstone & Baird, 1988, 242). Instruction in a learning strategy needs to be matched to a student's abilities and needs (Ellis & Lenz, 1987; Cole & Chan, 1990) and for cognitive training to be effective, it needs to be

matched optimally to the developmental and metacognitive level of the individual (Cole & Chan, 1990).

. "Teachers can help students to develop realistic goals and plans for themselves which they see as both feasible in general and within their power to achieve "(Evans, 1991, 53).

. Mulcahy et al (1991, 34) suggest that the teacher break down learning processes or competencies into component parts and analyse "the variety of cognitive strategies that may be employed at each component stage to ease the learning process." Palinscar (1986) also refers to easing the learning situation. She recommends that teachers need to critically evaluate strategies to determine the ease with which they can be instructed and the flexibility with which they can be used across an array of situations.

Costa & Lowrey (1989, 67-72) suggest additional strategies for enhancing the development of metacognition in students.

. Conscious choosing. Teachers can promote metacognition by helping students explore the consequences of their choices and decisions prior to and during the act of deciding.

. Differentiated evaluations. Teachers may enhance metacognition by causing students to reflect upon and to categorise their actions according to two more sets of evaluative criteria eg. "What was helpful and what was hindering?"

. Taking credit. Teachers can have students identify what they have done well.

. Outlaw I can't. By having students identify what is required or what skills are lacking in their ability to perform is an alternative and acceptable response. This helps students identify the boundaries between what they do and do not know.

- Labelling student's cognitive behaviours. When the teacher places labels on students' cognitive processes, it can make them conscious of their actions.

- Clarifying student's terminology.

- Making human errors. By admitting he/she does not know an answer, and by being able to self-disclose, a teacher is demonstrating empathy.

5.7 SUMMARY OF APPROACHES

A number of cognitively-oriented instructional approaches have been designed to meet the learning problems of people with intellectual disabilities and to address the issue of programming for generalisation. For the purpose of the intervention study, it has already been argued that content and thinking skills are inseparable and for this reason approaches that are not context-specific are not examined. In their summary of cognitive approaches, Conway & Gow (1990) indicate that many of the approaches have a considerable degree of overlap.

- They incorporate a common belief in the need to provide training that enhances generalisation.

- They reflect in the "zone of proximal development " work of the Russian researcher Vygotsky (1962) and recognise "that the learning process is cognitively-based and is concomitant with a progressive internalisation of instruction" (Conway & Gow, 1990, 354).

- They also stress, though not always explicitly, the importance of student responsibility for learning and perceiving the application of learned strategies to other related tasks.

- They seek to ensure that the student moves from being a passive acceptor in the learning task to being actively involved. In this way, the student becomes aware of his/her own cognitive strategies and

takes responsibility for his/her own learning - ie. these techniques aim to provide the student with executive processes or metacognitive skills.

The approaches of Campione & Brown (1979) and Meichenbaum & Goodman (1979) rely on teacher guidance and modelling to move the learner from overt awareness of the processing strategy to covert self-directed application of the strategy across settings. They have sought to teach strategies that are general in nature but that can be applied across situations. Their techniques relate to the method of processing rather than the actual content but have been applied in context-specific training programs (reading). They highlight the application of the strategy in other settings and make links between settings.

Brown & Palinscar (1986) have focused on reciprocal teaching which is based on an interactive concept of 'expert scaffolding' whereby learner behaviour is shaped following a teacher (expert) model. A teacher and a small group of learners take turns in leading group discussion relating to the topic by using specific strategies. The teacher fades out of the learning situation, allowing one of the learners to perform this role as that learner becomes more competent.

As noted by Evans (1991), the approach does not use explicit teaching strategies in the early stages of strategy acquisition. It is also argued whether such an approach would take into account the preconceptions, and in some cases misconceptions, that some students bring to a particular task. Bransford & Vye (1989) stress that these inaccurate beliefs must be changed if progress is to be made.

Meichenbaum & Asarnow's (1979) instructional program (VSIT - Verbal Self-Instruction Training) is based on a five-step procedure as outlined by Conway & Gow (1990):

. *Cognitive modelling* where the instructor models or performs a task while talking aloud.

. *Overt external guidance* requiring the learner to perform the same task under the direction of the model's instructions.

. *Over self-guidance* where the learner performs the task while instructing him/herself aloud.

. *Faded overt guidance* requiring the learner to whisper the instructions while working through the task, and

. *Covert self-instructions* involving the learner performing the task while guiding his/her performance via private speech.

The model also involves a combination of task-specific and/or general self-statements such as problem definition, planning, self-evaluation, self-reinforcement and coping in an effort to enhance generalisation (Conway & Gow, 1990).

Wong (1988) warns that there are at least three points that researchers and practitioners should seriously register prior to engaging in self-questioning instructional research/application similar to the studies described above. Two of her warnings are similar to those of many researchers into metacognitive strategy training. There is a need for training in thinking skills to be supported by domain- specific knowledge and that studies need to realise that the training in any strategies takes time.

However, her third warning seems to be aimed specifically at the self-questioning technique. She argues that a given self-questioning strategy may likely interfere with usual strategic routines. Even though much of the research related to spelling and metacognitive skills has used a self-questioning format, it is argued that generally the self-questioning studies tend to be prescriptive in nature and are therefore unsuitable for the instruction of the metacognitive aspects of spelling. It was argued in the previous chapter that the orthographic system is largely regular but as Henderson & Templeton (1986) indicate there are three ordering principles in the spelling system: alphabetic, within-word pattern and meaning. To spell efficiently the student needs to be able to be flexible in choosing either phonological, visual or semantic strategies to suit the task at hand. A prescriptive self-questioning technique does not allow for such flexibility and is therefore not considered to be flexible enough for the

needs of the intervention study, in that it tends to provide a recipe for problem solution which may not only interfere with the student's usual strategic routines but also limit the ways in which the student can ultimately solve the problem for him/her self.

Gow's (1987, 1988) Self-Instruction Problem-Solving (SIPS) approach was developed in Australia to teach people with intellectual disabilities independent living skills in ecologically-valid environments. The verbalisation component of the program has its derivation in the verbal self-instruction work of Meichenbaum and Asarnow (1979). The verbalisation is designed to focus the learner on specific strategies to use when approaching a new problem, by assisting the learner to reflect, analyse, interpret and make decisions across settings. Some questions are of a general nature to focus the attention of the learner on the task (*What do I have to do?*) and prompt a problem-solving sequence (*How am I going to do it?*). These more general questions then lead learners to specific verbalisations that guide them through the task. Self-statements designed to teach self-evaluation and coping are also taught. According to Conway and Gow (1990, 351) these procedures assist in keeping the program flexible and variable to ensure that learning does not become 'welded' to a specific instructional situation or process. Although the general philosophy and principles of the SIPS approach were felt to satisfy the needs of the proposed study, the approach was not examined further since the application of the approach seemed to have been concentrated in the area of the development of self-management skills rather than academic skills.

Mulcahy et al (1991, 197) have developed a cognitive strategy-based program which attempts "to teach cognitive learning-thinking strategies systematically, utilising the curriculum as a vehicle. " The characteristics of the SPELT program are summarised by Mulcahy et al (1991).

- Shows that it is possible, through a systematic program of instruction, to train young or intellectually low-functioning children to be strategic in their learning and thinking behaviour .

- Teaches learning and thinking strategies within content, and not as an independent or curricular activity.

- Assumes that all categories of children - gifted, normally achieving, learning-disabled, and intellectually disabled - can benefit from strategy instruction and that instruction in learning strategies might best take place in the regular classroom.

- Targets three curricular areas - academic learning; thinking and problem solving; and social competence.

A progression from lowest level of strategy acquisition (acquisition through teacher imposition - Phase I) to the highest level of acquisition (acquisition through self-regulation - Phase III) is the goal of the SPELT instructional continuum (Mulcahy et al, 1991).

Phase 1 Teaching is direct and consists of the presentation of a number of recommended and teacher-generated strategies designed to expose the students to the fact that cognitive strategies exist (metacognitive awareness) and to illustrate that organised goal-directed and efficient use of learning strategies increase their ability to acquire, think about, remember, retrieve, express and apply information and ideas.

Phase 2 involves teaching for transfer. Strategies that were initially taught in one subject area are introduced in other subject areas, settings and/or situations. This process of adapting strategies to new applications inevitably leads to modifications and/or extensions of the strategies taught in Phase 1. During Phase 2 the students analyse the efficiency and effectiveness of their own strategy use, based on previously taught strategies. This active use and modification facilitates transfer and/or the development of critical thinking skills. Phase 2 personalises the strategies and acts as a stepping stone in the student's ability to self-generate effective learning and thinking strategies, which is the goal of Phase 3.

In both Phases 2, 3 the teachers engage in what Mulcahy et al (1991) term *Socratic Dialogue* , an interactive relationship between teacher and students, where the teacher leads the students through questioning to discover relationships for themselves. Teacher behaviours advocated in Socratic Dialogue are also employed to encourage precise use of vocabulary and clarity of expression. If unclear communication is evident, the

teacher's role is to facilitate clarity of responses before discussion continues (Mulcahy et al, 1991).

Mulcahy et al (1991) stress that in order for teachers to understand the philosophy and methodology of SPELT as well as to comfortably implement the program, in-service training with follow-up is required. Anstey (1988) also stresses that if teachers are to teach students to use cognitive and metacognitive strategies, they need to understand and use cognitive and metacognitive strategies themselves. Mulcahy et al (1991) argue that in the past some aspects of classroom teaching have emphasised the teaching of thinking skills, but that instruction in this area has usually been unconscious and/or incidental, lacking precise goal or direction.

It is argued that the SPELT approach would be the most suitable of the approaches to use or modify for the proposed spelling and metacognitive strategy training study. The approach's philosophies tend to concur with the suggestions in the literature that:-

. Teachers need to provide explicit training in the early stages of strategy acquisition but that they need to gradually relinquish control for the application of these strategies to the students;

. Interactive teaching procedures are necessary to foster cognitive and metacognitive skills;

. Strategy instruction should be embedded within the content area eg. spelling; and

. Attributional training should be incorporated into strategy training routines.

5.8 DETERMINING STUDENTS' METACOGNITIVE AND STRATEGIC KNOWLEDGE

Reeve and Brown (1985) believe that all students should not be exposed to similar interventions, and that interventions should be sensitive to the learner's current cognitive level. " Assuming that the

emergence of conscious self-regulation skills follow an orderly developmental course, it seems likely that children of different ages and abilities will be at different phases in the development of metacognitive skills" (Reeve and Brown, 1985, 353).

Rowe (1988) believes that we can be reasonably confident that a student is behaving metacognitively within a particular content domain, if the student demonstrates the ability to monitor and/or regulate his/her cognitive performance; if the student's performance is enhanced or facilitated by such metacognitive activity and if the student demonstrates metacognitive knowledge or skill across a number of settings within that particular content domain. The evaluation of such metacognitive knowledge and skills can provide extensive and process oriented characterisation of the functioning of individuals (Rowe, 1988). However a problem lies in how to observe and monitor growth in metacognitive knowledge and skills. Another problem, as Bransford & Vye (1989) stress, is the importance of assessing the preconceptions, and in some case misconceptions, that students bring to the instructional task, since these inaccurate beliefs need to be changed if progress is to be made.

Essentially, the task is to elicit information about what another person knows, and how he or she processes information, ie. to make essentially covert information overt (Rowe, 1988).

Two prominent methods currently used to externalise cognitive and metacognitive strategies in the literature (Cavanagh & Perlmutter, 1982; Ericsson & Simon, 1984; Garner, 1988; and Rowe, 1988) are what Cavanagh & Perlmutter (1982) term independent measures (interviews and questionnaires) and verbal protocols resulting from the students' thinking aloud. According to Garner (1988), both can be classified as verbal report methods in that students tell receptive listeners (typically researchers) what they have on occasion thought and done, what they might think and do in a hypothetical situation, or what they are thinking and doing while completing a task at hand.

Considerable caution is required in the interpretation of any such verbal reports. Cavanagh & Perlmutter (1982) warn that several problems are inherent in any method used to assess knowledge about cognitive

processes. The two most serious and recurrent concerns relate to accessibility of cognitive processes for introspective analysis and truthfulness and completeness of a verbal report. Further general criticisms include the following:-

- Garner (1988) cautions to always treat protocols as incomplete records of thinking and to avoid the error of equating language with thought. On the other hand, Winser (1988) argues that although think-alouds are claimed not to be acceptable as observations about mental states ie. introspections, they are seen as commentaries about a cognitive operation almost at the point of its execution.

- Since verbal ability is also inherent in all verbal report methods, they are especially problematic when used with individuals having limited linguistic skills eg. young children (Cavanagh & Perlmutter, 1982).

- Verbal difficulties can mask strategic strengths (Cavanagh & Perlmutter, 1982; Garner, 1988). Garner (1988) suggests that some nonverbal assessment of cognitive and metacognitive strategic knowledge may be in order.

Specific problems are directed at interviews and questionnaires:-

- Cavanagh & Perlmutter (1982) question whether interview questions actually assess what researchers want to know. That is, the investigator must be sure that the subject is interpreting the question correctly.

- The multiple-choice and Likert-scale formats used in most written questionnaires can be problematic since they tend to be restrictive (Cavanagh & Perlmutter, 1982).

- Cavanagh & Perlmutter (1982) suggest an additional use of interviews and questionnaires is to assess students' knowledge about metacognition after an experiment. In this case, students are asked to report retrospectively the thoughts they had during the experiment (Cavanagh & Perlmutter, 1988). However, they warn

that a serious problem with this technique is that what the students report may not be true reflections of what they did during the experiment.

- Not only do learners sometimes know more than they can tell, but learners on occasion report using cognitive and metacognitive strategies they do not demonstrate using (Garner, 1988).

- Young children may not be proficient and/or experienced in responding to highly general questions or probes (Garner, 1988).

- Cuing and probes offered by instructions can provide a broad hint of the most desirable response (Garner, 1988).

- The large process/reporting distance allows memory failure and may result in an inaccurate verbal-report record (Garner, 1988).

- Interviews often elicit responses to hypothetical situations that are difficult for young children to interpret (Ericsson & Simon, 1980; Garner, 1988).

However, as Palinscar & Brown(1989, 23) indicate while there may be a difference in what children do and what they say they do, interviews "are a useful means of gaining partial access to the child's knowledge and attitudes." The more specific the questions and the more specifically the context is defined for the child, the more useful the information an interview yields (Garner, 1987; Palinscar & Brown, 1989). Further, as noted by Rowe (1988), both objective (multiple choice) tests and more open-ended assessment tools can play a role in the assessment of metacognitive knowledge and skills. She suggests that multiple-choice tests are uniquely suited to certain assessment needs, such as monitoring the performance of large numbers of students, or measuring change over time.

In verbal protocols or think aloud methods, subjects are required to verbalise all thoughts that come to them while performing a task (Cavanagh & Perlmutter 1982; Palinscar & Brown, 1989). The most serious problem with think-aloud methods is the possibility that the mediating processes responsible for translating processing into verbal reports

interfere with carrying out the task. The result is an incomplete verbal report both in terms of quantity and quality (Cavanagh & Perlmutter, 1982; Garner, 1988). Winser (1988) endeavoured to overcome the problem of interrupting the task at hand by videoing the student at work. He later replayed the video and asked the student what he/she did when they came upon any difficulty. Ericsson & Simon (1984); Winser (1988) show that as long as not too much strain is put on the student's memory his/her reports are likely to be valid as evidence of his/her actual processing. Cavanagh & Perlmutter (1982) suggest that a possible solution is to use several types of verbal protocols in an effort to uncover similar response patterns across methods.

An alternative to the interview or "think-alouds" is to present students with vignettes and ask them to evaluate the approaches each student took and ask them to compare each to their own approaches (Palinscar & Brown, 1989). Cavanagh & Perlmutter (1982) suggest another technique, that of peer tutoring. The measure of knowledge is implicit in the tutoring thus eliminating the need for probe questions. The experimenter is in a better position to tap the tutor's understanding and perception of the important task factors and the situation is likely to be highly motivating. However, there is no guarantee that children express all that they know about a strategy.

As the literature (Cavanagh & Perlmutter, 1982; Garner, 1988) indicates, it should be evident that no single method is immune to criticism. However, a number of guidelines for supportive reflective-access conditions have been suggested by Ericsson & Simon 1980 and others.

. Tap information available in short-term or activated memory.

. Ask learners what they do and think not why.

. Recognise that some verbal reports may be incomplete, but may still contain useful information. Prompt full reporting in a noncuing fashion, and with minimal process disruption.

. Consider methods that reduce verbalisation demands, particularly in gathering information from young children.

. Assess reliability of responses.

. Observable nonverbal behaviours (eg. eye movements) are an excellent companion database (Flavell , 1981; Garner, 1988).

In general, concurrent measures (during or at least in the context of) are preferable to independent measures (introspections made about hypothetical tasks and past personal experiences) (Cavanagh & Perlmutter, 1982). For this reason, the intervention study will heed the advice of Cavanagh & Perlmutter (1982). They suggest that a better alternative is to use multiple assessment techniques to provide converging measures of the variable of interest. Judicious combinations (methods not sharing the same sources of error) allow the researcher to capitalise on the strengths and avoid the pitfalls of each separate method (Cavanagh & Perlmutter, 1982; Garner, 1988). However, it is also to be noted that the type of methods used will to some extent be determined by the available time frame and the access to material and personnel resources.

5.9 RESEARCH METHODS

Cranstone & Baird (1988) and other researchers point to what they believe to be limitations of much previous work with regard to metacognitive instruction :-

. Narrow goals (Cranstone & Baird, 1988). Wilson (1988) is critical of the ANOVA-regression paradigm (Wilson's terminology) which he claims is currently dominating educational research. He argues that such methods are so prescriptive and preordinate, that they focus the inquiry process on things that are already known and therefore miss the unanticipated.

. Inadequate understanding of and support for individual change (Cranstone & Baird, 1988).

- By virtue of their experimental character, training studies fail to take into account the nature of the underlying processes and abilities being trained. Metacognition is much more than the sum of the trained individual skills and strategies. Winser (1988) criticises some research as being laboratory oriented and setting out to control the subtle and complex activity that is teaching. Such research is not congruent with the interactive methods of instruction suggested in the literature for the development of cognitive and metacognitive strategies.

- Training studies are limited in time. Metacognition might best be described as a developed general tendency which is built up over time and across many and varied incidences (Rowe, 1988). "One of the consequences of limiting the length of time in experimental research studies is that, as yet, little is known about how the effective strategies function over longer periods of time in actual learning situations" (Wilson, 1988, 269).

As Wilson (1988, 273) argues it seems essential that "studies be conducted in the actual learning situation and that researchers consider the long-term effects of teaching students new strategies." For these reasons, the proposed intervention study will use qualitative data collection and analysis methods to take into account the complex interactive nature of the classroom. As Wilson (1988, 270) suggests naturalistic methods, designed to examine activities as they occur in the real world, are excellent for detecting the unexpected and for "producing a thick description of the state of things." By adhering to the guidelines suggested by the proponents of qualitative research (Bogdan & Taylor; 1984; LeCompte & Goetz, 1982; and Marshall & Rossman, 1989) the proposed intervention study should have what Marshall & Rossman (1985) term "truth value" and the findings be generalisable to real classroom situations.

5.10 SUMMARY

This chapter examined the literature to determine how metacognitive strategies should best be taught. It explored issues related to how it should be taught and where that instruction should take place.

With specific criteria in mind, it then examined existing cognitive oriented approaches in order to find the most appropriate for the proposed intervention study.

Ways of reliably determining the students' current levels of functioning were explored. This was done so that the students in the proposed intervention study could be optimally placed for instruction. Finally a comprehensive research design which would align as closely as possible with the largely interactive nature of metacognitive instruction in a real classroom situation was sought.

Although research into cognitive and metacognitive strategy instruction has been promising, there continue to be persistent problems with maintenance and generalisation (Cole & Chan, 1990). It is important to heed the warnings in the literature if the proposed intervention study is to be successful.

It is noted that training in the proposed intervention study should involve a combination of both direct and indirect instruction. In the initial stages of strategy instruction the teacher will need to explicitly teach not only what strategies but how to and when to use them and why to do so. During this stage also any student misconceptions, would need to be corrected. As Cole & Chan (1990) indicate, the teacher would need to explicitly train general executive skills such as planning, checking and monitoring eg. "What do I need to do to be able to spell the word? How am I going? Do I need to change to another strategy? Perhaps it would be better to think of a base word" etc.

In the early stages of the program, strategy instruction will be mainly teacher imposed and directed. Then gradually, through interactive instruction both with the teacher and with peers in small group situations, control will be ceded to the students. It is strongly noted that time will be required for this process since as Cole & Chan (1990) state, over learning is required to achieve automaticity.

It is stressed that the strategy training be implemented in the regular classroom for several reasons:-

. To aid generalisation of the use of the learned skills to a variety of spelling/writing situations.

. To be in consonance with the inclusive schooling movement.

. So that high, medium and low achieving students can benefit from the strategic behaviour of one another (Mulcahy et al, 1991).

. To save duplication of material and personnel resources.

Provision will need to be made for learning and thinking strategies to be acquired as the content and concepts of spelling are taught/learned. For this reason it is stressed that strategy instruction will need to be backed up by instruction in spelling (word study, mini lessons, focused learning episodes etc.) as mentioned in previous chapters which reviewed the literature of spelling. Of importance also will be the need to teach the thinking skills related to not only spelling in isolation but to spelling in writing and proof reading situations as well, if the required cognitive and metacognitive skills are to transfer to where they are required in a variety of real writing situations.

As mentioned in the previous chapter on metacognition, as well as in this chapter, the proposed intervention study will need to seriously consider student self-perceptions and attitudes. It will, therefore, need to incorporate attributional training into strategy training in order to develop positive control beliefs (Borkowski, Weyhing & Turner, 1986; Evans, 1991).

After a close examination of specially devised cognitively oriented instructional approaches, it is believed that the SPELT (1991) program would be the most appropriate to be used as a basis for the proposed intervention study since its philosophies tend to concur more closely with the suggestions in the literature. It is noted that successful implementation of the SPELT program, of necessity involves training of teachers. Therefore, ample time for the researcher, as the Support Teacher, to collaborate with the Class Teachers in the preparation, implementation, monitoring and evaluation of the program will need to be built into the proposed intervention study.

Heeding the warnings of Cranstone & Baird (1988) with regard to the limitations of previous metacognitive study designs and taking into account the nature of the underlying processes and abilities being trained, the proposed intervention study will need to provide adequate time for the cognitive and metacognitive skills to develop. However, it is important to note that the amount of time available may be determined by the nature and length of the school year.

Before embarking on the intervention, the proposed study will need to determine the students' current levels of functioning with regard to metacognitive knowledge and skills related to spelling. However, a problem lies in how to observe this. As the literature indicates, no method is immune to criticism. As suggested by Cavanagh & Perlmutter (1982) the proposed intervention study will need to judiciously use multiple assessment techniques in order to capitalise on the strengths and to avoid the pitfalls of each separate method. It must be pointed out, however, that the methods used in the proposed intervention study will be determined to some degree by the available time frame and access to material and personnel resources.

To enable the research design for the proposed intervention study to align as closely as possible with the largely interactive nature of the metacognitive strategy training instruction; the complex nature of the inclusive classroom; and to enable the findings to be applied in real classroom situations; qualitative methods of data collection and analysis will be used.

CHAPTER 6 STUDY ONE- METHODOLOGY

CHAPTER 6

STUDY - ONE METHODOLOGY

6.1 INTRODUCTION

Marshall & Rossman (1989) note that those who conduct qualitative research, as is proposed for this research, face a challenge. It is considered that because qualitative research is at times unfamiliar to evaluators and judges, the research design must be sound. This is difficult for there are no rules and no explicit, guaranteed recipes to follow for pulling together a coherent and convincing argument (Patton, 1990). Marshall & Rossman (1989, 51) argue that a pilot study "demonstrates not only the researchers ability to manage qualitative research but also the strength of the approach for revealing enticing research questions." For these reasons, it seemed prudent to conduct a pilot study, study one, in which the effectiveness of the intervention was to be explored. A second phase, study two, involving three classes from which six students were to be selected for in depth case studies was planned to examine more deeply and critically the patterns and initial insights that arose during study one.

TIME LINE

Study One - 1994

Sample One class (Year 5 R) examined as a whole and divided into three groups A (good spellers), B (average spellers) and C (poor spellers including the average to

	good readers/poor spellers) for teaching purposes and for further investigation.
Stage 1	**Pre Intervention Stage**
First term, 1994	Training of Class Teacher Initial standardised and informal assessments (summative) Initial data collection
Stage 2	**Intervention Stage**
Second and third terms, 1994	Intervention Periodic informal assessments (formative) Data collection Weekly planning meetings (Class Teacher and Support Teacher) Analysis of data
Stage 3	**Post Intervention Stage**
Fourth term, 1994 First term, 1995	Data collection Final standardised and informal assessments (summative) Analysis of data Report writing

Study Two - 1995

Sample	Three classes (5/6 R, 6 P and 7 P) were examined. Three students from 5/6 R and three students from 6 P were selected for in depth case studies.
Stage 1	**Pre Intervention Stage**
First term, 1995	Training of Class Teachers Initial standardised and informal assessments (summative) Initial data collection
Stage 2	**Intervention Stage**
Second and	Intervention

third terms, 1995	Periodic informal assessments (formative) Data collection Planning meetings (Class Teachers and Support Teacher) Analysis of data Selection of students for case studies
Stage 3	**Post Intervention Stage**
Fourth term, 1995 First term, 1996	Data collection Final standardised and informal assessments (summative) Analysis of data Report writing

The next two chapters describe study one which explores whether the intervention, which combines word study, spelling strategy and attribution training in an integrated classroom, is feasible; tests the appropriateness and logic of the methodology; devises ways of managing the data; and explores the effectiveness of the intervention. This chapter describes the methodology for that study.

6.2 PURPOSE OF STUDY ONE

There were several reasons for conducting study one

1. To explore the effects of the intervention in one classroom before embarking on a multi site study.

2. To explore whether the intervention, which is designed specifically to be implemented in the integrated classroom setting was feasible. It is considered that the actual research will be both time consuming and labour intensive. The participating class teachers will need to be trained and the amount of time they can allocate to the training will depend upon whether the schools consider the cost/benefit ratio to be favourable. Spelling/writing activities will be competing with a range of forever increasing incidental activities eg. Jump Rope for Heart, for time in the school weekly timetable. Because of the constraints of the school year, the

time for pre testing has to be limited to the first term, post testing to the last term, leaving terms two and three for the intervention.

3. To test the appropriateness and the logic of the methodology. To increase the validity of the findings of the actual research it is proposed that a combination of both qualitative and some quantitative methods of data collection will be used. However, while such measures may allow the researcher to capitalise on the strengths and avoid the pitfalls of each separate method (Cavanagh & Perlmutter, 1982; Garner, 1988), the time and effort required may be excessive. For this reason, the proposed data collection techniques may need to be rationalised. Care will need to be taken so that internal validity is not jeopardised in the rationalisation process.

4. To devise ways of managing and analysing the data. Patton (1990) argues that the researcher must have some initial framework for managing the voluminous data collected during the study.

6.3 RESEARCH METHODS

6.31 RESEARCH STRATEGY

The initial study was approached largely from a qualitative point of view because of:-

. Gaps between existing research into spelling instruction and its application to the classroom (Bouffler, 1984; Frith, 1980; & Winch, 1989);

. The largely interactive nature of metacognitive strategy training instruction;

. The need for students to transfer what is learned in spelling/word study to real writing situations in all subject areas; and

. The complex nature of the inclusive classroom.

However, because of the very nature of the research and because the intervention was incorporated into the integrated language arts program of an intact class, the research may be termed a quasi-experiment. When compared with stringently controlled quantitative designs, the design may therefore appear unreliable and lacking in validity. The researcher needed to be confident that the intervention did in fact make a difference with respect to the spelling behaviours of students . Therefore to increase confidence in the findings, a combination of quantitative and qualitative data gathering techniques (triangulation) was used.

6.32 SITE AND SAMPLE SELECTION

A letter requesting permission to conduct the research in Catholic schools in the Brisbane Archdiocese was sent to the Chairman of the Ethical Review Committee, Catholic Education Centre, Brisbane. Permission was duly granted.

Because of the very nature of educational research, it is realised that neither the schools, classes, nor students within those classes can be randomly selected. It was proposed that the actual research be conducted in a school in which the researcher works as a Support Teacher. As the Support Teacher visits her schools twice per week, the researcher as Support Teacher should be able to maintain the continuity of presence that is recommended by Marshall & Rossman (1989).

For the purpose of study one, the research problem was investigated in one class in one of the schools. The school was a co educational Catholic primary school of 177 children in Brisbane's North East Region. In the school at the time were seven straight (as opposed to composite or multi age) classes from Year One to Year Seven. The class (Year Five) for the initial study was not randomly selected. Rather the class was chosen because the students were in the middle to upper primary years and the Class Teacher defined her philosophy of the teaching of spelling as being interested in an integrated approach but with a need to provide more structure in her program. She also believed that in her class were several hard core poor spellers together with students who were average to good readers but poor spellers. Marshall & Rossman (1989)

indicate criteria for selecting a site that at least approximates the ideal. One of the criteria states that there be "a high probability that a rich mix of many of the processes, people, programs, interactions and/or structures that may be a part of the research question will be present" (Marshall & Rossman, 1989, 54).

Twenty-four students (twelve boys and twelve girls) of the class of 27 Year Five students were included in the study. Three students could not be included because they were not at school for the duration of the intervention. Nine of these students were considered by the Class Teacher to be very poor at spelling. The poor spelling ability of these students was confirmed by scores on the South Australian Spelling Test (Westwood, 1993). At the time of the pre tests, their spelling ages ranged from 1.7 years to 3.2 years behind their chronological ages. Also in this group was a special needs student, Scott, whose spelling age was 5.1 years behind his chronological age. Carla, Katie and Caroline, in this group of poor spellers, were nominated by the Class Teacher as having average to above average reading ability. (Refer to Table 1, below). Her perceptions were confirmed by scores on the GAP Reading Test (McLeod, 1986).

Table 1
Average to Good Readers but Poor Spellers (March) Year 5R

Name	Chr. Age	Reading Age	Spelling Age
Carla	10.3	10.3	8.9
Caroline	9.6	10.3	8.2
Katie	9.6	10.8	7.8

The Class Teacher is a mature teacher with 11 years of experience. She has taught all year levels ranging from Year One to Year Seven and has had experience in a variety of learning situations including straight, composite and multiage classes. For the last two years, she has been one of the school's Key Teachers in the Queensland's Department of Education's English Language Arts (ELA) Program. Key Teachers from schools were educated in the philosophy and methodology of ELA. It then became the responsibility of Key Teachers to disseminate this information, through a specifically designed facilitator's package, to other teachers on their staff. It

is considered that Mrs R's beliefs about spelling instruction would have been influenced by her role as a Key Teacher for ELA. Mrs R's beliefs about spelling (as written by her) that underpinned her practices at the beginning of the study were:-

. Spelling is necessary for communication in writing.

. Learning to spell is a developmental process.

. Teaching of spelling is necessary to develop skills and confidence.

. Spelling develops through writing.

. Spelling should be thought of as related to writing and not an unrelated subject.

. Children need to be able to correct their own writing (spelling and punctuation).

6.3.3 DATA COLLECTION TECHNIQUES

As noted earlier, triangulation techniques were used in order to gain a more comprehensive view of the outcomes of the research. However, it should be noted that study one was being used to trial their use.

Student Questionnaire

Refer to Appendix C.

A questionnaire was adapted from that devised by Johnson (1989). The written questionnaire was administered as a group exercise to all members in the class in the pre intervention stage of the study. Questions were designed in such a way as to gain information about each student's motivational state (attitude towards him/her self and attitude towards language), knowledge and use of skills involved in spelling/writing and knowledge and use of spelling strategies. Students were requested to write comments if they needed to clarify a response. As the answers were

written, information gained about spelling difficulties was useful in determining baselines for instruction.

The questionnaire proved useful and effective in terms of time and was therefore used in the post intervention phase of the study.

Interviews

Refer to Appendix D.

In the pre intervention stage of study one, a group/class interview was conducted jointly by the researcher as Support Teacher and the Class Teacher to check the accuracy of information gathered in the questionnaires. Cohen & Manion (1989) indicate that group interviews are practical since they cause a minimum of disruption. They indicate also that group interviews can yield a wide range of responses. The interview provided an opportunity for those who found it difficult to write in the questionnaire to say what they meant. While a great deal of information was gained and the opportunity was provided to set class ground rules for spelling, it was difficult to keep track of which student gave which answer and whether or not a student truthfully stated a strategy that he/she actually used, or whether the answer was thought of after the previous student's answer. Additionally, some of the answers differed from those given in the questionnaire. According to the questionnaire, the main strategy used for assisting with an unknown spelling was "to look in the dictionary". When questioned orally in the group interview, the main strategy used appeared to be "to sound the word out."

Clearly an interview of some kind was necessary to complement the questionnaire. However, the group interview, although requiring little time was fraught with problems. For this reason, individual interviews were conducted by the researcher during the post intervention stage of study one. They were what Cohen & Manion (1989) term 'focused' interviews. Questions were asked to gain information about each student's motivational state and knowledge and use of spelling strategies. However, the exact content, sequence and wording of the questions were in the hands of the interviewer.

Standardised Spelling Test

The South Australian Spelling Test (Westwood, 1993) was administered both pre and post intervention. This test is an Australian normed test constructed specifically to highlight spelling difficulties and is a recently revised version of the 1979 South Australian Spelling Test. Apart from supplying reliable quantitative data, information from the test can also be used diagnostically in an endeavour to assess students' spelling developmental levels and areas of difficulty. It should be noted here, that spelling ages for this test are represented in years and tenths of a year. In an endeavour to be consistent, therefore, through out this research all ages are represented in this form. Problems may arise when good spellers in the upper grades reach the upper limits of this test. Students who correctly spell from 53 to 70 words receive the same spelling age, 15.5 years. When a student reaches this level, a gain in terms of spelling age, is not registered even though the student may improve his/her raw score.

Standardised Reading Test

The GAP Reading Comprehension Test (McLeod, 1986) was used at the pre intervention stage only in order to assist in the identification of students with average to above average reading ability and poor spelling ability. The test uses a cloze format and quotes reliability figures, using the split-half technique, ranging from .90 to .94. The test was chosen because it is quick and easy to administer and mark. However, very little information about the norming procedure is provided in the manual and it is therefore open to question. The test has a ceiling of 12.6 + years and therefore scoring in the upper levels may not be accurate. Because of the test's limitations, particularly for children in the upper levels, it is proposed that another reading test be used in study two.

Informal Spelling Assessment

Refer to Appendix E.

Bear and Barone's (1989) informal spelling assessment was used as a group test at the pre intervention stage of the initial study. The purpose of the assessment was to:-

. Gain information about spelling difficulties in order to establish a baseline for instruction [stage of development according to Henderson's (1985) stages of development];

. To determine the word features that the students needed to study; and

. To enable students to be grouped for instruction.

While this assessment provided a wealth of information about students' spelling skills, more information was needed about the students' knowledge and use of cognitive and metacognitive strategies. Valuable information had been collected through the questionnaires and interviews but the researcher was aware of the probable sources of error. Garner (1988) states that cuing and probes offered by instructions can provide a broad hint of the most desirable response. Other methods (verbal protocols or think aloud methods) not sharing the same source of error were required.

Eye Accessing Cues

Appendix F

Bear and Barone's (1989) Informal Spelling Assessment was used as a basis for another assessment tool (Eye Accessing Cues) which was administered individually during the post intervention stage. Brooks (1989) argues that eye movements supply information to the trained observer about what representational system (visual, auditory, kinaesthetic) system is being searched for, together with information about whether the image is in memory or being constructed.

In the think time before the student wrote each word in the Informal Spelling Inventory (Appendix E), the researcher sat in an appropriate position, to track the eye movements as the student attempted to spell an unfamiliar or difficult word. The information was recorded on a specially prepared sheet (Appendix F). The instrument was to be used as an adjunct to Think-Alouds in gathering information about the student's knowledge and the use of cognitive and metacognitive strategies and his/her motivational state.

However, it if felt that the amount of information gained was not proportional to the amount of time spent. The movements of only one of the students was clearly observable. It is also felt that the results could not be considered reliable. The researcher has received training but has not had a great deal of experience with respect to the recording of eye movements. It was therefore difficult to see and record the eye movements in the extremely short space of time. For these reasons, it is proposed that the Informal Spelling Inventory be administered as a group test only in the second stage of the study.

Think-Alouds - Dictation/Proof Reading

Refer to Appendix G.

This instrument was administered individually during the post intervention stage in an endeavour to gather more information about student's knowledge and use of cognitive and metacognitive strategies and motivational state. A passage containing words from levels I to VI of the Qualitative Inventory of Word Knowledge (Schlagal, 1989) was dictated to the student and the student was then given time to proof read the passage. The student was asked to verbalise all thoughts that came to him/her in attempting to write an unfamiliar word while writing during dictation and later during the proof reading process. As advised by Ericsson & Simon (1980) full reporting was prompted in a noncuing fashion and with minimal process disruption. Garner (1988) suggests that some nonverbal assessment of cognitive and metacognitive strategic knowledge may be in order. This assessment provided the researcher with ample time to observe and record non verbal behaviours eg rubbing out, tilting the head, raising an eyebrow and "silent" verbalisations. With over twelve years experience as an early childhood educator and Support Teacher, trained and experienced in techniques of observation, it is considered that the researcher was capable of carefully observing and recording behaviour with a high degree of objectivity.

Informal Spelling in Writing Assessment - Spelling Miscue Analysis

Refer to Appendix H

An example of self-corrected, unassisted writing from each student was collected for analysis during the pre intervention and post intervention stages. Examples of writing were also collected periodically to analyse and monitor students' spelling progress in real pieces of writing. Records of spelling accuracy were kept (Refer to Appendix I).

There appears to be scant information in the literature about functional ranges of spelling in actual writing situations. In discussing a student's spelling competence in an example of expressive writing, Kemp (1987) states that the accuracy rate is low at 70%. The 1995 trial of the Year Six Test was an activity of the Queensland Government's Shaping the Future initiatives and was the first time Year Six students in Queensland have participated in a statewide test of aspects of literacy and numeracy. Reports on the test were prepared by the Australian Council for Educational Research. Information given about writing on a student's report, described a typical student's writing at a particular level. The description about the spelling competence of students who were placed in the middle range, where 60% of students scored, was "correct spelling easily outnumber misspelling." Schlagal (1989) refers to functional levels (frustration level, instructional level and independent level) in his spelling research. However, they are designed to be used with Schlagal's (1989) developmental spelling inventory rather than spelling in writing. The graded list on which a student scores 50% or higher indicates his/her instructional level.

Believing the available information about spelling competency levels in actual writing situations to be either too broad or limited, the researcher turned to the literature about functional levels in reading assessment. When interpreting a running record or miscue analysis in reading, a percentage accuracy of 95% or better is considered to be an independent reading level (student can read with meaning); between 85% and 95% is considered to be an instructional level; and below 85% is considered to be a frustrational level. (Education Department of South Australia, 1984). Subsequently, for the purpose of the research, a spelling accuracy level of 95% in final drafts of writing was set as the desired level.

However, because of the individual nature of expressive writing, it would be difficult and erroneous to say from figures alone that progress had been made. For example, a comparatively good speller who wrote expressively and took risks in writing unfamiliar words could end up with a lower score than a comparatively poor speller who simply wrote the words that he/she could spell. For this reason, the spelling analyses, collected during the intervention phase were primarily used as a diagnostic tool in determining what was to be taught.

The miscue analysis was based on the work of Kemp (1987). The purpose of the analysis was to:-

. Assist in the establishment of a baseline for instruction [stage of spelling development according to Henderson's (1985) stages of development];

. Enable students to be grouped for instruction;

. Determine the strategies that students use to spell;

. Determine the word features that students need to study; and

. Determine if students transfer to spelling in writing what they do in spelling in isolation.

Informal Spelling Assessment - Proof Reading Tests (Teacher Made)

Refer to Appendices J and K.

Passages for proof reading of approximately one hundred words in length were taken from the students' current reading material in order to attempt to control the level of difficulty. Errors of high frequency found in the students' pieces of expressive writing were incorporated into these passages. These proof reading assessments were given during the pre intervention stage and periodically to:-

. Determine and monitor students' attitude to proof reading;

. Determine and monitor students' knowledge and use of proof reading strategies; and

. Determine and monitor students' ability to attend to errors.

It may be argued that it is unwise to allow students to see errors in case they become imbedded as correct. However, Kemp (1987, 218) argues that since the proof reading task requires the student to "*attend* "to the errors, he can see "no reason why such an approach to spelling testing (and thence teaching) should not be adopted."

Records were kept of the students' correction rates (Refer to Appendix K). With respect to reading running records a self correction rate of between 20% and 50% is considered good (Education Department of South Australia, 1984). Because of the scarcity of information in relation to correction rates in the literature on spelling, the aforementioned figures were adopted in the study.

It should be noted that the ability to proof read a particular text depends to a large degree on the student's ability to be able to read and understand the text and this in turn depends on the readability level of the text. Although every attempt was made to control the readability levels of the texts, discrepancies may have occurred.

Proof Reading Tests of Spelling (PRETOS)

To add strength to the data gathered from the informal proof reading tests, it was decided to administer a standardised proof reading test during the post intervention stage. The authors (Croft, Gilmore, Reid & Jackson, 1981) state that the abilities assessed by the PRETOS are broader than those associated with traditional assessments of spelling. The tests incorporate reading for understanding, scaled vocabulary according to age level, error detection in the script and the use of context in determining the right homophone (their, there) to be used.

PRETOS provides normative scales (percentile rankings) for both reproduction (correct rewriting) and recognition (correct identification of errors and errorless lines). While the tests have an achievement

orientation (the five tests range from approximately Australian Year Three to Year Seven), the test can be used diagnostically. Each test paper contains a classification of error summary. Because of the valuable objective and diagnostic information gained, it is proposed that PRETOS be used in both the pre test and post test stages of study two.

Anecdotal Records

Refer to Appendix L.

Anecdotal records were kept by Class Teacher and Support Teacher. The purpose of anecdotal records was to gather further information related to students' knowledge and use of cognitive and metacognitive strategies and information about their control beliefs through an unobtrusive measure. As suggested by Marshall & Rossman (1989), unobtrusive measures are particularly useful for triangulation because as a supplement to interviews, non reactive research can check truthfulness.

It must be noted however, that in the case of study one because of the "business" (contact time with students, meetings with parents, playground duties, staff meetings the increasing amount of record keeping and unplanned for interruptions) of the school day, this section of the research was not given the attention that was required. Much potentially valuable data, including negative aspects, was not recorded.

6.34 PROCEDURE

Management Plan, Time Line

It is stressed that the time plan could be only general in nature because of the nature of school life which involves both expected (school fete) and unexpected (class liturgy) events. Further, because of the nature of qualitative research, the original plan had to be modified as data was collected (questionnaire followed by a group interview) and as the need for more focused data collection became apparent.

. **Stage 1**

First term, 1994 Training of Class Teacher

	Initial standardised and informal assessments (summative) Initial data collection

. **Stage 2**

Second and third terms, 1994	Intervention phase Periodic informal assessments (formative) Data collection Weekly planning meetings (Class Teacher and Support Teacher) Analysis of data

. **Stage 3**

Fourth term, 1994 First term, 1995	Data collection Final standardised and informal assessments (summative) Analysis of data Report writing

Stage 1

The intervention was implemented in the regular classroom situation for several reasons:-

. Because of gaps between existing research and its application to the classroom (Bouffler, 1984; Frith, 1980; & Winch, 1989).

. To aid generalisation of the use of the learned skills to a variety of situations (Cole & Chan, 1990; Rowe, 1988).

. To be in consonance with the inclusive schooling movement (Dalmau & Thompson, 1992).

. So that high, medium and low achieving students could benefit from the strategic behaviour of one another (Mulcahy, Peat, Andrews, Darko-Yeboah, Marfo & Cho, 1991).

. To save duplication of material and personnel resources.

. To provide an opportunity to offer practical support to the Class Teacher in the implementation of the program.

It is suggested that to aid the success of the program the Class Teacher needed to accept ownership and this could only be achieved if she was involved from the outset. She was fully informed as to how, when and why the research was to be conducted. During the first stage, three one hour sessions (out of school time) were devoted to training the Class Teacher in all aspects of the intervention. Mulcahy et al (1991) stress that in order for teachers to understand the philosophy and methodology of SPELT (a cognitive strategy-based program adopted as a large component of the intervention) as well as to comfortably implement the program, in-service training with follow-up is required. Marshall & Rossman (1989) state that a researcher should devise ways to reciprocate those involved in the research who have adjusted their priorities and routines to assist the researcher. It is felt that by providing initial training and follow-up training as requested by the Class Teacher, the researcher may have fulfilled this requirement.

In the first stage of the research, data was collected using both standardised and informal procedures :-

. To assist in answering the research question; and

. To determine the baselines for instruction.

It is argued that data quality could be reasonably assured. Because of the nature of the qualifications of the Support Teacher, this particular Support Teacher has been trained in data gathering and analysis techniques. Extra out of school time was devoted to training the Class Teacher in data gathering techniques. Subsequently it is argued that since the Class Teacher acted as a participant researcher by being responsible for implementing the program and collecting certain data, threats to internal reliability should have been reduced.

The Class Teacher was responsible for administering and marking the following standardised tests in a group situation:- the South

Australian Spelling Test (Westwood, 1993) and the GAP Reading Comprehension Test (McLeod, 1986). The Support Teacher administered the following informal tests in a group situation:- the Informal Spelling Test (Bear & Barone, 1989) and the Student Questionnaire. The Group Interview, devised to gather supporting information for the Student Questionnaire, was conducted jointly by the Class Teacher and Support Teacher. During this Group Interview, the students helped the teachers to set "ground rules" for spelling. Materials for Proof Reading tests and the Miscue Analyses were prepared by the Support Teacher. They were administered by the Class Teacher and marked by the Support Teacher and/or Class Teacher.

Stage 2 - Intervention

The intervention sought to provide a balanced approach to the teaching of spelling by combining aspects of both traditional and whole language approaches. It is believed that it is possible to teach spelling and still remain true to the philosophies of whole language (Holdaway, 1979), process writing (Graves, 1983) and developmental spelling (Gentry, 1982). Although spelling was not taught formally as a separate subject, spelling was taught. As suggested by the proponents of whole language, there were many opportunities for students to read, write and talk about words. Words related to the integrated unit of study eg "Myself and Others" permeated the school day and were subsequently used by students in numerous writing activities. Children's misspellings in these writing activities became the focus for word lists and word study. In this way spelling was considered within the context of writing.

Planning began with the identification of the students' needs (individual, group and class needs). Data from the assessments allowed the children to be placed at various stages of development (Henderson, 1985). This guided the Support Teacher and Class Teacher in the selection of the major teaching emphases for each group (Refer to Appendix M.)

Through out the intervention, the Class Teacher and Support Teacher planned and worked co operatively. Assessment and teaching were closely linked. Therefore there was a need for the teachers to meet for approximately half an hour each week to analyse informal

assessment data; to define and redefine objectives; and to plan learning experiences for individuals, groups or the whole class. Two half hours of teaching time per week were devoted to word study/strategy and attribution training. During this time, the Support Teacher worked with the Class Teacher in a variety of ways. At times, the teachers were involved in team-teaching. At other times, a Teacher's Aide or Parent Tutor assisted in group work. On occasions, the Support Teacher withdrew a group for intense instruction (phonemic awareness) over a period of four weeks. On the two days of the week that the Support Teacher was at the school, she was available as a consultant.

There were word lists but not lists taken from a text book. A typical spelling list for the week included core words, theme words, and words that were misspelt in students' writing. There was also a section in the list where each individual student could record his/her personal words. Each week, the Class Teacher gathered misspellings. The misspellings were categorised according to knowledge/skills/strategies required. This enabled the teachers to choose particular word groups eg. contractions for inclusion in the weekly word list and for word study either at the group or class level. This information was subsequently recorded on a Spelling Objectives Checklist.

The word study lessons which arose from the needs of the students focused on the "how" rather than the "what" of spelling. The students were encouraged to see word patterns, develop rules and notice unusual features of words. A "playing around" with language was encouraged. Bloodgood (1991) advocates word study activities that enable students to explore and practice elements of orthography. Games such as 'word sorts', 'word webbing', 'word hunts' etc. not only provide enjoyment but promote inquiry and experimentation with words that are challenging and exciting.

Students were grouped for word study according to their particular needs and/or stage of development. "By analysing spelling errors and observing reading and writing behaviours over time, the teacher will be in a position to make diagnostic decisions about the developing competencies of his/her individual students" (Bear & Barone, 1989, 291). However, a total individualisation of instruction would have meant that

the teachers' time would have been thinly spread. The researcher's twelve years of experience as a Support Teacher indicates that organisation for instruction is indeed a concern for a Class Teacher. One compromise lies in the creative use of groups. For the intervention, students were initially grouped for differential instruction according to the various developmental levels as suggested by Bear & Barone (1989). However, at times groups were changed to meet a particular recently diagnosed need eg. adding endings. At other times, specific group activities were organised to highlight aspects of English orthography.

Students were trained in the metacognitive aspects of spelling. SPELT (A Strategies Program for Effective Learning/Thinking) developed by Mulcahy et al (1991) was adopted as the model for the metacognitive training as its philosophy tended to concur with the suggestions in the literature. A progression from the lowest level of strategy acquisition (acquisition through teacher imposition - Phase 1) to the highest level of acquisition (acquisition through self-regulation - Phase 3) is the goal of the SPELT instructional continuum (Mulcahy et al, 1991).

In Phase 1, strategies were explicitly taught. The students were taught how, when, where and why to use those strategies and were exposed to the fact that the use of such strategies was beneficial. Phase 2 involved teaching for transfer. Firstly, strategy instruction occurred in word study lessons and was then introduced into structured writing situations eg. modelled writing and modelled proof reading. In Phase 3, the instruction became more interactive as students became more confident with the use of the strategies. The aim was for the children to be able to monitor their own use of the strategies. It should be stressed that this progression was not necessarily linear.

Attributional training was incorporated into the strategy training to develop positive control beliefs. Cranstone & Baird (1988) believe in teachers' providing relatively rapid pay off for students who undertake the effort which metacognition demands. Students were encouraged to use strategies; were guided to understand that the use of strategies in spelling was helpful and they were subsequently rewarded for their efforts. "Great! You realised that the word did not look right and you corrected it yourself."

Bodycott's (1993) Spelling Cycle was adapted as a way of presenting the spelling strategies (Refer to Appendix N). Learning to spell involves the use of strategies in three stages:- (1) In writing, when the student is unsure of how to spell a word, strategies are used; (2) In proof reading, when the student endeavours to correct the misspelling, strategies are used; and (3) When the word becomes part of the class word list, strategies are used to aid the learning of the word so that its spelling may become automatic.

A mnemonic (McLERT) was developed as an aid to assist students in remembering the key words (MEANING, CHUNKING, LOOKS, EXAGGERATION, RULES, TRIGGERS) for the strategies that can be chosen from to assist when the student is unsure of the spelling of a word (Refer to Appendix O). COPS, a self-correcting strategy, from the SPELT program was adapted and added to assist in the proof reading stage (Refer to Appendix P). The well documented LOOK-COVER-WRITE-CHECK procedure was adapted to assist in the learning of words. Two extra components were added - SAY and THINK. This was done to encourage the student to THINK of other strategies eg EXAGGERATION or CHUNKING to assist with learning and later recall. (Refer to Appendix Q).

Analytic Procedures

Quantitative data analysis procedures were used to analyse data from the South Australian Spelling Test. Students' spelling ability (spelling age) in isolation were assessed by the South Australian Spelling Test prior to the intervention and after the intervention (Refer to Appendix R). It is argued that under optimum conditions a student should make at least the same gain in spelling age as chronological age increases. For this reason, three means were calculated :- the mean of the spelling ages in the March pretest, the mean of the predicted spelling ages in November (that is if each student made a gain of 0.7 year in spelling age during the .7 year between the pre test and post test) and the mean of the spelling ages in the November post test. These means were calculated for not only the whole class but for each of the spelling groups (A, B, C).

A Repeated Measures Analysis of Variance was used to evaluate the effect of the intervention on the students' spelling ability in isolation with respect to the whole class. The mean of the predicted spelling ages in November and the mean of the actual spelling ages in the November post test were used in the statistical test. It is argued that the test of statistical significance would provide a standard for comparing the observed difference in spelling ability to the expected chance difference in spelling ability (due to interest level motivation, fatigue, ability etc). The significance level (p-value) for rejecting the null hypothesis was set at 0.05 (Smith & Glass, 1987).

Following the grounded theory work of Glaser & Strauss (1967), data collection and analysis went hand in hand. It has already been stated that assessment and teaching were closely linked. Formative assessment involved the observation and monitoring of students' performance in spelling. The information gained from both incidental and planned assessments helped to determine the activities the teachers planned for the class as a whole, for groups and for individual students. In this way the research data also was continually being analysed.

To bring the data (qualitative and quantitative) into manageable form, it became necessary to generate categories. Rather than reinvent the wheel it seemed appropriate to adapt categories advocated for use in monitoring, assessment, evaluation and subsequent planning by the Department of Education, Queensland (1994) and the Education Department of Western Australia (1994). Objectives for spelling and word study were expressed in terms of Attitudes, Knowledge, Skills/Procedures and Strategies. It is believed that the intervention would allow the students to progressively develop and refine their Attitudes, Knowledge, Skills/Procedures and Strategies. These categories provided a basic framework for the data analysis. Other categories within this framework emerged as data was being collected and analysed. Subsequently the students' progress was monitored and the data was categorised and analysed in terms of the following categories .

Attitudes

Included in this category are statements about students' motivational states.

- An enjoyment in writing.

- A development of an interest in words.

- A willingness to take risks and to experiment with new words.

- Confidence in ability to spell.

- The development of a "spelling conscience".
  - Good spellers take responsibility for getting spelling correct. (Education Department of Western Australia, 1994).

  - Good spellers realise that the ability to spell easily and automatically allows them more time to devote to other aspects of writing (Education Department of Western Australia, 1994).

  - Good spellers realise the need for getting spelling correct:-
    - When spelling is correct it is easier for the audience to read what is written.(Graves, 1983).
    - People "make judgements about our level of literacy" (Education Department of Western Australia, 1994, 15).

Knowledge

Included in this category are statements about the aspects of spelling that are raised to consciousness including declarative knowledge, procedural knowledge and conditional knowledge.

- A development of the understanding that although the English language is not a regular language, it is systematic and patterned. There are 3 "ordering" principles in the English spelling system. (Henderson & Templeton, 1986).
  - Spelling by Sound
  - Spelling by Visual Pattern (common letter clusters - 'ough')
  - Spelling by Meaning. The way we use and understand spelling depends upon the context eg. 'their/there'. In many

instances the morphology (morpheme - basic unit of meaning) of a word assists the spelling more than the pronunciation does eg. 'magic/magician'.

- A development of the language of the English spelling system eg. short and long vowels, consonants, consonant blends etc.

- A knowledge that the same sound can be represented by different letters or letter clusters - 'cut / couple'.

- A knowledge that the same letter or letter cluster can represent different sounds - 'enough / cough'.

- A knowledge of grapho phonic relationships.

- A knowledge of common letter clusters in the English spelling system.

- A knowledge of meaning based relationships.

- A knowledge of strategies to assist the learning of new words.

- A knowledge of strategies to assist when attempting to write unknown words.

- A knowledge of strategies to assist in proof reading.

- A knowledge of HOW, WHEN, WHERE and WHY to use the above strategies.

Skills/Procedures

Included in this category are statements about students' ability to use spelling features (short and long vowels, prefixes, suffixes, contractions, compound words and silent letter sequences etc.) in spelling in isolation and in context. Since the South Australian Spelling Test (Westwood, 1993) provides information about students' spelling skills it is included in this category. This category also includes statements about

students' ability to use the procedure of proof reading. Since PRETOS - Proof Reading Test of Spelling (Croft, Gilmore, Reid & Jackson, 1981) provides information about students' ability to proof read it is included in this category also.

Spelling is marked by the use of the following:

- Grapho phonics - sound-symbol relationships

- Visual Letter Patterns
  - Letter patterns, letter sequences, letter positions
  - Words within words
  - Words with double consonants
  - Silent letters
  - The same sound can be represented by different letters or letter clusters - 'c**u**t / c**ou**ple'.
  - The same letter or letter cluster can represent different sounds - 'e**nough** / c**ough**'.

- Morphology (the parts of words that carry meaning)
  - Plurals
  - Compound Words
  - Adding 'ing' etc. with unchanged roots
  - Prefixes and suffixes
  - Verb tense - present, past and past participle
  - Possessive pronouns and use of apostrophe for possessive nouns eg. Mary's house

- Contractions

- Homophones 'their /there'

- Generalisations/Rules

- Editing and Proof Reading

- Etymology (origin of word and development of its meaning)
  - Imported words - 'pasta'
  - Acronyms - 'Anzac'

- Patch words - two words into one 'breakfast/lunch --- brunch'
- Anglo-Saxon, Greek and Latin prefixes and suffixes
- Greek and Latin roots

- Authoritative Sources
  - Dictionary
  - Thesaurus

Strategies

Included in this category are statements pertaining to the students' use of spelling strategies and the students' ability to plan, regulate and evaluate their own use of the strategies.

- Strategies to assist the learning of new words. LOOK, SAY, THINK, COVER, WRITE, CHECK

- Strategies to assist when attempting to write unknown words.
  - Meaning strategies - knowledge of derivation, homophones, compound words, base words, prefixes and suffixes.
  - Visual strategies - visual memory, alternative letter patterns, words within words.
  - Phonological strategies - letter /sound knowledge, breaking into letter clusters, syllables.
  - Use of clear articulation and pronunciation.
  - Use of exaggerated pronunciation for words like 'doctor'.
  - Use of memory triggers - 'practice/practise' - 'ice' is a noun so 'practice' is a noun.

- Strategies to assist with proof reading
  - Identify incorrect spelling.
  - Identify what is incorrect and generate alternative versions.
  - Check an authoritative source.

For the purposes of instruction in the intervention stage, students were grouped according to stages of development. This alleviated many problems with respect to program planning, program implementation and classroom management. This same grouping (A, B, C) was adopted as a way of further managing the analysis of data. Subsequently data for each

of the groups was categorised and analysed (using colour coding) under the headings of Attitudes, Knowledge, Skills/Procedures and Strategies.

6.4 SUMMARY

This chapter described the methodology for the initial phase of the intervention study, and suggested changes to the design if and when considered necessary in an endeavour to tighten and strengthen the research design.

Because the intervention was incorporated into the integrated language arts program of an intact class, it was explained why the research could perhaps be termed a quasi-experiment. To counter this argument, this chapter showed how through triangulation (combination of both quantitative and qualitative data gathering techniques), the confidence in the findings of the research could be increased.

A Year Five class in a school of 177 which the researcher, as Support Teacher, visited twice weekly was selected for the initial study. Reasons for this particular selection were outlined as adhering to the suggestions for site and sample selection proposed by Marshall & Rossman (1989).

Data collection techniques were described in detail. Proposed changes in an effort to rationalise the process for use in study two were discussed. Care was taken at the same time to make suggestions where the data gathering needed to be strengthened. For example, it was proposed that the GAP Reading Comprehension Test (McLeod, 1986), used in the study one, should be replaced with a more valid test in study two.

A time management plan which guided the research in study one was provided. The research was conducted over three stages. Stage two, the treatment stage, was outlined in detail. The chapter explained how the Class Teacher and Support Teacher worked co operatively to plan, implement, monitor and evaluate the intervention which combined word study, spelling strategy and attribution training in an integrated classroom.

Both quantitative and qualitative data analysis procedures were used. A Repeated Measures Analysis of Variance was used to evaluate the effect of the intervention on the students' spelling ability in isolation. The significance level (p-value) for rejecting the null hypothesis was set at 0.05. To bring the data (qualitative and quantitative) into manageable form, it became necessary to generate categories (Attitudes, Knowledge, Skills/Procedures and Strategies) as a basic framework. The class was organised for word study into three groups. Subsequently data was categorised and analysed in terms of the categories for each group of students.