TEACHING FOR METACOGNITION: DEVELOPING INDEPENDENT, SELF-REGULATED LEARNERS IN THE NORTH WEST PROVINCE OF THE REPUBLIC OF SOUTH AFRICA

BY

KWAZI NTOMBIZODWA MAGWENZI
(BA., PGCE., B.ED., M.ED.)

SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN THE DEPARTMENT OF TEACHING AND CURRICULUM IN THE FACULTY OF EDUCATION AT THE UNIVERSITY OF NORTH WEST.

SUPERVISORS: PROFESSOR S A AWUDETSEY
PROFESSOR M W MWENESONGOLE
MR A C NYAKUTSE

DATE: DECEMBER 2000

K N MAGWENZI
(BA., PGCE., B.ED., M.ED.)

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DECLARATION

I declare that the dissertation for the degree of Doctor of Philosophy at the University of North West hereby submitted has not been previously submitted by me for a degree at this or any other university, that it is my own work in design and execution and that all materials taken from other sources contained herein have been duly acknowledged.

SIGNATURE: .....

Kwazi Ntombizodwa Magwenzi

CERTIFICATE OF ACCEPTANCE

This dissertation entitled "Teaching for Metacognition: Developing Independent, Self-regulated Learners in the North West Province of the Republic of South Africa", written by Kwazi Ntombizodwa Magwenzi of the Department of Teaching and Curriculum in the Faculty of Education is hereby recommended for acceptance for examination.

SUPERVISORS: ----------

Professor S A Awudestey

Professor M.W. Mwenesongole

Mr A.C. Nyakutse

DEPARTMENT: Teaching and Curriculum

FACULTY: Education

INSTITUTION: University of North West

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ABSTRACT

The study is an investigation on teaching strategies that promote the development of metacognition in learners. It attempts to determine the extent to which educators use teaching strategies that foster the development of metacognition in their learners. Metacognition plays a key role in producing learners who are independent and self-regulated.

An experiment was conducted to test the effect of metacognitive training strategies on achievement in learners (with special reference to the development of summarisation skills of second language learners of English). Secondly, educators were investigated through the use of questionnaires to determine if their classroom practice facilitated the development of metacognition in the learners they teach. The focus was on four areas. Firstly, the use of groups in instruction was investigated. Secondly, educators were evaluated on instructional approaches and practices. Thirdly, educator preferences on classroom arrangements or designs were assessed. Finally, educators were evaluated on the use of assessment strategies and techniques.

The investigation involved six hundred and forty research participants. Three hundred educators from thirty high schools in the Mafikeng, Zeerust and Lichtenburg Districts were used for the non-experimental part of the research. Questionnaires, interviews and lesson observation methods were used for data collection in the study. Twenty educators took part in the interviews and lesson observations. Three hundred and twenty learners participated in the experiment.

Results obtained from the experimental part of the research identified the use of learner-centred teaching strategies and collaborative classrooms as ideal environments for developing metacognition in learners. Secondly, the use of practices that foster self-regulation like planning and goal setting, promoting self-questioning and critical thinking, scaffolding, facilitating and coaching were identified as ideal in fostering the development of metacognition.

Results obtained from the non-experimental part of the research (which evaluated the extent to which educators use practices that develop metacognition) revealed that educators in the study project a teacher-centred orientation in the classroom. Results obtained on the use of groups showed that the majority of educators in the study (approximately 80%) favour the use of whole class teaching in comparison with groupwork or the use of pairs. About 68% of the educators in the study use teacher-centred instructional approaches daily. Less than 3% of the educators in the study use learner-centred methods like problem solving and reciprocal teaching as a feature of daily classroom practice. The use of rows emerged as the popular classroom arrangement or design with 67% of the educators in the study indicating daily use of this design. Approximately 76% of the educators in the study prefer the use of teacher-made tests as opposed to learner-centred assessment like self-evaluation and peer evaluation.

The study concluded that the majority of educators use teacher-centred practices that are not likely to foster the development of metacognition in learners. The need for comprehensive training of educators on learner-centred, collaborative classrooms was identified.

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1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

South Africa should provide an education system that will develop citizens to be fully competent to make an effective contribution to the development of the country.

Outcomes Based Education was introduced in South Africa in January 1998 in response to this realisation. It was aimed at

> . . . equipping all learners with the knowledge, competencies and orientations needed for success after they leave school or have completed their training. Its guiding vision is that of a thinking, competent future citizen (Department of Education: 1997a: 1).

Most South Africans are aware of the fragmentations and weaknesses of the past apartheid education system in the country. There were obvious disparities between Black, White, Coloured and Indian education. Provincial education departments developed their own subject curricula. Politically, administratively and educationally, there was a need for integration and innovation (Kallaway: 1988, Christie: 1992). Apart from political and administrative weaknesses, this system was criticised for obvious academic weaknesses. It is possible to measure the success of any education system by the products of that system - the learners. Because of the constant use of memorisation, drilling techniques and chalk and talk teaching strategies, learners were seemingly passive and dependent. One would hardly expect such candidates to display adequate problem solving and analysis skills in later life.

> . . . the 1984 Education Act (called the National Policy for General Education Affairs Act) recognises 15 education departments in South Africa. There are separate "own affairs" departments for Whites, Coloured; Indians and Africans in the "common areas" of South Africa, and there is a "general" education department as well. Then there are separate education departments for each of the homelands.

> The problems and inequalities of apartheid education are well known. We all know that there is a shortage of money for black schools. We know that there are too few schools, overcrowded classrooms, underqualified teachers and poor facilities.
>
> (Christie: 1992: 101)

Although the country has experienced a change of government in 1994 and a subsequent transformation of the education system in line with the new democratic policies, today it is evident in most South African schools that most learners continue to be passive and dependent (Department of Education: 1997b). They rely on the educator to hand down information. They lack adequate problem solving skills to make them autonomous, self-regulated learners.

In recent years a number of First World countries, for example, the United States of America, have implemented programmes that are aimed at developing autonomy and self-reliance in learners (Garner: 1987). It is quite imperative for South African educators to develop essential skills for independent learning in their learners. Learners need training in order for them to develop strategies to handle learning problems independently.

1.2 STATEMENT OF THE PROBLEM

The central concern of this study was to identify teaching strategies that are likely to facilitate the development of metacognition in learners. This study also sought to determine to what extent educators in the North West Province of South Africa use teaching strategies that develop metacognition in learners. Such strategies are essential in creating learners who are independent and self-regulated.

There is an urgent need for South African educators to help learners to develop thinking and learning skills needed for success in learning. Within the education system in South Africa, there are many learners who do not take responsibility for their thinking and learning. Some of these learners are passive consumers of information that is packaged and handed down by the educator. A number also

exhibit symptoms of what Ganz and Ganz (1990) term "learned helplessness". Such learners have a passive helpless attitude that results in a lethargic approach to school work. Ganz and Ganz (1990) maintain that these learners are not in control of their own learning. They lack metacognitive abilities.

This study focused on teaching strategies that develop metacognition in learners, with specific reference to the North West Province of the Republic of South Africa (see Appendix G, Maps 1 and 2). The study also examined teaching techniques and metacognition in an attempt to establish useful teaching strategies in developing independent, self-regulated learners who are capable of executing effective learning strategies.

1.3 RESEARCH QUESTIONS

The following key questions are regarded as important in determining the extent to which educators can develop metacognitive skills in language learning and these provided the focus of this study:

i. What instructional techniques are useful in developing metacognition in learners?

ii. Are there any differences in achievement between learners who receive metacognitive teaching strategies and those who are exposed to other strategies of teaching?

iii. What teaching strategies do secondary school educators in the North West Province of South Africa prefer to use in their daily practice of teaching?

iv. Which of these teaching strategies employed by educators could facilitate the development of metacognition?

v. To what extent do prerequisites for developing metacognition exist in the

practice of these educators?

vi. To what extent do the classroom and school environment foster the development of metacognition in learners?

1.4 PURPOSE OF THE STUDY

The purpose of this study was to propose useful teaching strategies for developing metacognition ability in learners, particularly in the learning of summarisation skills in language education. The study examined the effect of metacognitive training strategies on the development of summarising skills in learners. Groups of learners who received training in metacognitive strategies were compared to groups of learners who had not received any metacognitive training in order to establish the usefulness of metacognitive training strategies in the teaching-learning situation.

This study also sought to establish whether prerequisites for metacognition exist in the practice of educators in the North West Province schools of South Africa. An examination of the educators' practice is likely to reveal whether these practitioners teach with a conscious awareness to develop metacognition, with an aim to produce autonomous self-regulated learners. The examination of the educators' practice involved an evaluation of their techniques and methods and also an assessment of learning environments. Certain identifiable teaching and learning approaches promote metacognition in learners whilst others (as found by Tinzmann: 1990) have been known to stifle the learner's ability to become an independent self-regulated thinker in the teaching-learning situation.

Through experimentation on the effect of metacognitive training strategies on learning and an examination of studies on metacognition, this study sought to establish useful guidelines and practical suggestions on teaching strategies and techniques that can be considered as valuable in developing metacognition in learners. Useful ideas on establishing a metacognitive environment in the classroom were explored.

1.5 SIGNIFICANCE OF STUDY

Educators should teach with a conscious awareness to develop autonomous, self-regulated learners (Tudor: 1996). This goal can be realised if they are aware of the usefulness of metacognitive ability in the development of independent learners. This study provides insight on metacognition and the powerful role it plays in developing autonomous learners.

Several researchers, for example, MacDonald (1990),Schneider (1985), and Pesut (1990) have found out that teaching strategies used by the educator in the classroom develop particular orientations in learners. According to them, certain teaching techniques develop learners who project great dependence on the educator. The educator becomes the information giver and a source of knowledge. The learner turns into a helpless, powerless consumer of information. Other teaching techniques empower the learner to become an active participant in the teaching-learning situation. The learner develops into a powerful team member, with significant contributions to make in the classroom. This study provides vital ideas on some of the teaching strategies that promote the development of metacognition. From these ideas educators could develop an awareness of metacognition and the effect of selected teaching strategies on the learner. However, awareness of metacognition and its merits in the teaching-learning situation is not sufficient guarantee that educators will practise it. The researcher is aware that they need the knowledge, expertise and motivation to successfully execute teaching techniques that develop metacognition in learners. This study is likely to prompt our educators to think deeply on the whole question of teaching strategies. The emphasis is on the educators' need to develop skills, knowledge and the expertise to train learners to be able to cope with the complex world of the twenty-first century.

The ideas presented in this study could be a useful starting point in prompting South African educators at all levels of the education system to develop an awareness of the importance of metacognition in language studies in an education system that seeks to develop independent, creative, and critical thinkers who are in control of their

educational success.

1.6 RATIONALE FOR THE STUDY

Metacognition has been a major focus of research in education and psychology in developed countries in the past two decades. Many researchers believe that it holds a great deal of promise for helping learners to do better. Metacognition has been linked to a wide variety of positive academic outcomes for learners, such as better grades and performance on tests of intelligence. It is therefore important for educators to be aware of metacognition and the teaching of metacognitive strategies and behaviours to learners (Brown and Campione: 1977,Flavell: 1976a, 1976b, 1979, Ganz and Ganz: 1990, Lindenberg: 1987, Lockhart and Lockhart: 1995, Schneider: 1985, Schoenfield: 1987, Stevens: 1988).

Metacognition is a learning strategy. Learning strategies refer to the behaviour and thought processes used by learners that influence what is learned. Metacognition is a cognitive learning strategy. Cognitive learning strategies are mental strategies learners use to analyse particular learning problems (Arends: 1997).

Metacognition has two components: The first relates to having explicit knowledge of learning processes (Flavell: 1979) the other concerns the ability to use comprehension strategies by monitoring and controlling one's own thinking and learning (Brown and Day: 1983). Learners must be assisted to develop reasoning abilities.

The development of metacognitive skills is not inherited; nor is it achieved through passive attendance at school each day. It is a process that must be presented to learners with a cohesive carefully planned strategy. Learners play a central role in their own learning. It is important that they should be able to develop self-direction and self-regulation. Many learners would find motivation in improving their grades through the development of metacognitive ability. A lot of students do not experience the joy of academic success for several varied reasons. Ganz and Ganz (1990) suggest that there are several causes for the lack of academic success many students experience. These causes include immature metacognitive knowledge and

strategies. Such learners do not monitor and control their thinking processes. They do not engage in useful self-monitoring techniques like self-questioning and self-correction in the performance of tasks.

Secondly, Ganz and Ganz (1990) point out that weak learners also fail to think about steps required to achieve a particular learning goal. They realize that they do not understand what was read or heard, but then fail to act on this understanding. They increasingly become passive in their learning efforts and come to believe that they are poor learners.

The new Outcomes Based Education system introduced in South Africa in January 1998, through its critical outcomes, indicates the kinds of learners the education system seeks to develop. Two of these outcomes indicate that learners should be able to demonstrate the following competencies:

i. . . . identify and solve problems by using creative and critical thinking.

ii. . . . organize and manage themselves and their activities responsibly and effectively (Department of Education: 1988: 16).

These outcomes indicate that one of the main aims of Outcomes Based Education is that all learners should be able to manage their own learning. The main purpose of metacognition is to develop in learners the capacity to accept more responsibility for learning.

It is quite possible that in the quest to create creative, critical thinkers, the answer lies in the conscious development of learners with metacognitive skills. Several terms are used to describe these types of learners including independent learners, self regulated learners, strategic learners and reflective learners (Arends: 1997).

The key focus of educational research geared toward improving the quality of education should be on educators and learners. Educators play a potentially powerful role in moulding the learners' attitudes and perceptions on learning.

Metacognitive strategies require the kind of educator who has the capacity to provide a sound knowledge base for learners and one who can harness the learner's potential to be analytical, evaluative and critical. In other words, reflective educators who possess metacognitive skills are able to produce learners who are capable of metacognition (Wenden: 1986, 1991).

A study of the concept of metacognition and the potentially powerful role it can play in seeking to train and develop competent, thinking citizens who are capable of creative, critical thinking is useful because it is the guiding vision of Outcomes Based Education. If the metacognitive ability of learners is enhanced, in the future

> . . . all South Africans will be active, creative, critical thinkers, living productive and fulfilling lives. These are the types of citizens who will lead South Africa to great heights (Department of Education 1997a: 3).

1.7 STATUS OF CURRENT RESEARCH ON METACOGNITION

Research on metacognition is a wide, dynamic field, particularly metacognition and its educational significance. The relevance of metacognitive instruction in facilitating positive academic outcomes is reflected in the findings of most studies (Zimmerman: 1994). Converging areas of research on the relationship between metacognition and comprehension and summarisation skills in language education demonstrate consensus on the view that metacognitive instruction facilitates comprehension and summarisation skills in language study (Baker and Brown: 1980, Brown: 1987, Rottman and Cross:1990, Schunk and Rice: 1992).

Metacognition is a complex concept, largely because of definitional variations and contributions from a wide variety of discipline, including psychology, sociology and education. Because of the various dimensions and definitional variations, each study on metacognition in education has clearly defined parameters. Specific definitional guidelines and methodological considerations are outlined to prevent possible misinterpretation. Full details of these studies are provided in Chapter Two. In the

studies reviewed in this research, researchers such as Brown and Day (1983), Rottman and Cross (1990) and others outline the relevance of metacognitive instruction in facilitating comprehension and summarisation skills and promoting learning skills in learners.

One notes that in studies conducted on metacognition, certain issues need to be resolved. Firstly, there is no consensus in current research on the "amount" of metacognitive instruction that is appropriate to yield positive academic outcomes. Secondly, methodological considerations vary from one study to another. Each study specifies the components of metacognition under investigation and reasons for the choice of particular research methodology. Thirdly, the issue of measurement is not settled. Metacognition remains a difficult concept to measure, particularly the testing of metacognitive behaviours such as self-monitoring, self-questioning and self-evaluation. More research is required to determine the quantity and combinations of metacognitive components and also the instructional time that will effectively and efficiently produce long-lasting results (Malone and Mastropieri: 1992).

A number studies on metacognition have been conducted on students with learning disabilities (Rottman and Cross: 1990, Schunk and Rice: 1992, Lategan: 1995, Kaplan: 1990). These studies provided evidence that metacognitive instruction enhanced reading comprehension and summarisation skills of students with learning disabilities. Some of the studies concentrated on metacognition in job-related situations (Mambanda: 1998, Sagor: 1999). In these studies metacognitive interventions led to improved academic achievement in research participants. A number of studies focused on metacognition in the school context (Topham: 1992, Mahuma: 1996).

In the South African educational context, metacognition has been a current research topic from the 1990s. Most studies support the relevance of metacognition is creating academically successful self-regulated learners (Topham: 1992, Mahuma: 1996, Mambanda: 1998). However, each study has its specific focus on the choice of metacognitive components, instructional techniques, instructional time and measurement techniques.

1.7.1 **Contribution of the Study**

This study focused on the effectiveness of metacognitive instruction in improving the summarisation skills of second language learners of English in the North West Province of South Africa. Although research has been conducted on metacognition in South African classrooms, according to the information provided in the national database of completed research projects, no research project has focused on the effectiveness of metacognitive instruction in improving the summarisation skills of second language learners of English in the North West Province of South Africa.

Studies on metacognition in the South African education context have focused on either learners or educators but not both (Kaplan: 1990, Lategan: 1995, Mahuma: 1996, Topham: 1992). The collaboration and interaction between the educator, the learner and other learners has not received adequate attention. Collaboration is a useful concept in promoting a metacognitive environment in the classroom and the school. This study has highlighted the interactive, collaborative models as not only the recommended contemporary models of instruction but also as powerful interactive tools in promoting metacognitive instruction in the classroom. It also assessed the extent to which educators in the North West Province of South Africa reflect an awareness of the usefulness of metacognition by employing teaching strategies that facilitate metacognition in their daily practice of teaching.

The study provides useful, simple guidelines on the teaching of summarisation skills to second language learners of English using metacognitive instruction. Educators who are in search of a systematic, step-by-step approach to help learners gain self-regulated approaches to summarisation are likely to find it a useful instructional tool.

1.8 **DELIMITATIONS OF THE STUDY**

The study focused on selected metacognitive teaching strategies in the broad field of metacognition. The selected strategies were considered relevant to the teaching of summarisation in language education. The selection of a number of strategies

provided focus and a conscious attempt to guarantee the internal validity of the study. (Limiting the scope of study to a specific number of metacognitive components meant that the researcher could adequately ensure that the study measured what it set out to measure). As in previous studies on metacognition, the study has specific definitional, operational and methodological considerations.

The study defines metacognitive skill in a learner as the ability to take responsibility for learning by independently planning, monitoring, evaluating learning activities and acting on success or failure in learning tasks (Blakey and Spence: 1990).

A significant number of studies on metacognition focus on students with learning problems (Malone and Mastropieri: 1992, Rottman and Cross: 1990). This study focused on normally achieving mixed ability classrooms to show that all learners, regardless of ability level and learning orientation, can benefit from metacognitive instruction. It is useful to note that the majority of educators in North West Province of South Africa teach in mixed ability classes of normally achieving learners.

The study employed the use of both experimental and non-experimental research methodology. Experimental research methodology is employed in most of the studies that test the effectiveness of identified metacognitive training techniques. Valid results have been obtained in the studies. Non-experimental research was employed to test beliefs and the practice of educators in order to establish the extent to which teaching strategies used by educators in the North West Province of South Africa could be considered useful in facilitating the development of metacognition. The study provided sufficient guarantee on experimental control that is not provided in some of the studies on metacognition, for instance, the Rottman and Cross study (1990).

The study also investigated the concept metacognition as it relates to the learners as well as educators (the practice of educators). Previous studies have tended to focus on either educators or learners in their study of concept "metacognition". The study was limited to three districts in the North West Province to adequately provide human and material resources needed for the experimental and non-experimental methods

required for the study of both educators and learners (see Appendix G).

1.9 DEFINITION OF KEY CONCEPTS

The following section outlines definitions of key concepts indicated in the title of the study:

1.9.1 Metacognition

Metacognition is often simply defined as "thinking about one's cognitive processes" (Flavell: 1979). According to Flavell metacognition refers to one's knowledge concerning one's cognitive processes, thinking processes or anything related to them (Flavell: 1976, 1978). It includes (i) the mental realisation of what we know, (2) monitoring and regulating how we go about learning.

In this study, the learner who possesses metacognitive ability is able to select and combine useful strategies for learning tasks. He or she is able to independently plan, monitor and assess learning activities and his or her own ability.

1.9.2 Independent, Self-regulated Learners

Independent learners are autonomous. They take responsibility for their own learning. Such learners are self-directed and they willingly take an active role in the teaching-learning situation by planning and regulating their activities. They are capable of teamwork with the educator and other learners and are competent in individual work.

Self-regulation includes the ability to define one's goals and also monitor and evaluate one's learning. This leads to increased self-direction and independence in the execution of learning tasks (Hugo: 1993). This study adopts this definition of the concept of self-regulation.

1.9.3 **Teaching**

The traditional view defines teaching as imparting knowledge to less experienced beings. However, one realises that in recent years the concept of teaching and the role of the educator have been transformed in keeping with the challenging modern environment we find ourselves in.

The role of the educator in the classroom has shifted from the primary role of information giver to that of facilitator, guide, resource-person and consultant. As a facilitator, the teacher provides rich environments and learning experiences needed for meaningful, collaborative study. The teacher is also a guide - a role that incorporates mediation, modelling and coaching (Tinzmann: 1990).

The modern view of teaching emphasizes learning and not teaching. Learners are viewed as individuals who are capable of autonomy and initiative. Teaching, therefore, involves encouraging learners to develop inquiry skills, critical thinking ability and problem-solving skills. Learners are given a rich learning environment - opportunities to interact with objects and events and thereby gain an understanding of new ideas and experiences. This study uses the concept of teaching in keeping with this modern view.

1.9.4 **Learners**

The terms "learners", "pupils" and "students" are used interchangeably in this study. They are used to refer to the children of school-going age normally found in educational institutions like secondary schools.

In the new Outcomes-Based Approach that was introduced in South Africa in the year 1998, the term "pupil" has been replaced by "learner" in the educational context. This study therefore uses the term "learner" in keeping with contemporary terminology in the South African education contexts.

The study has included a number of concepts that are related to the major concepts and these include metacognitive monitoring and control, self-questioning, critical thinking, collaboration, mediation, facilitating, modelling and scaffolding. These concepts are discussed in Chapter Two.

1.9.5 **North West Province**

The Republic of South Africa is divided into nine provinces. The North West Province is one of them. This province is situated on the Northwestern side of the country. Mafikeng is the capital city of this province and other important towns of the province are Klerksdorp, Litchtenburg, Potchesftroom and Rustenburg, (see Appendix G, Maps 1 and 2).

1.10 **ORGANISATION OF THE REPORT**

Chapter One contains an introduction to this study. The statement of the problem and related research questions, the purpose and rationale for the study are also presented in this chapter. The key concepts and delimitations of this study are discussed in the first chapter.

Chapter Two presents the review of related literature on metacognition and other aspects associated with the research question.

Chapter Three provides a description of the research design of this study. Data collection methods, measurement tools and also issues related to reliable and valid data collection methods are discussed.

Chapter Four presents the findings on the experimental research in the study. The experiment, methods, analysis of the findings and conclusions made on the experiment are presented in this chapter. The findings and analysis of data obtained from non-experimental data collection methods used in the study; namely questionnaires, interviews and classroom observations are also presented in this

chapter.

Chapter Five is a discussion on the main findings of the study provided in chapter four and also includes recommendations and suggestions for further research.

The last section of the report contains the reference list and Appendices A to H which illustrate data collection tools used in this study.

A deeper understanding of the relevance of metacognition can be provided by a review of literature on the concept, particularly studies on metacognition in educational contexts. The next chapter is a review of related literature on metacognition and its significance in creating successful autonomous and self-regulated learners.

CHAPTER TWO

2.0 REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION: HISTORICAL BACKGROUND

2.1.1 Theoretical Foundations of Metacognition

Metacognition is a concept whose foundations can be traced to the constructivist philosophy of Vygotsky. Constructivism is a philosophy of learning that was a leading perspective in the United States during the 1930s and 1940s. It was a movement that followed behaviourism and cognitivism. Lev Vygotsky, a Russian psychologist and philosopher in the 1930s, is often associated with constructivist theory. Within the theory of constructivism falls two schools of thought, social constructivism and cognitive constructivism. Although these schools of thought differ, they have one basic assumption about learning - that the learner is at the centre of instruction (Cheek:1992, Vygotsky: 1978).

2.1.1.2 Vygotskyian Principles

Vygotsky introduced a number of fundamental principles in his social constructivist theory. He identified the importance of the social context for cognitive development. He conceived the process of thinking as a social factor. The people around the learner greatly affect the way he or she sees the world. These people include the parents, peers, community and the educator (Gilbreath:1995, Lord:1994, Vygotsky: 1978, Yager:1991). From this first principle one sees the important role played by the educator in the social context that is vital for the cognitive development of the learners.

The educator is responsible for the quality of learning that the learner receives in the classroom. Constructivists believe that learning should take place in meaningful contexts. The role of the educator is to provide learners with authentic experiences, real world situations where they have the opportunity to construct new knowledge and

understanding.

Secondly, Vygotsky outlined what could be termed Tools for Cognitive Development (Vygotsky: 1978). These are the tools learners need for thinking skills. He stated that the type and quality of these tools determine the pattern and rate of cognitive development of the learner. Such tools may include significant adults in the learner's life, culture and language.

Language plays an important role in the cognitive development of learners. Vygotsky outlined the rule of inner speech. When young children engage in activities and dialogue with others usually adults or more capable peers, they gradually internalise this dialogue so that it becomes inner speech, something that eventually directs their thinking and behaviour. Inner speech, that is, conversations and thought we carry within ourselves begin as social dialogue with others and is vital in learning, planning and self-regulation (Forman and Cazden:1986, Vygotsky: 1962, 1978).

Vygotsky studied the self-regulating function of inner speech. He reasoned that when people are asked to solve difficult problems, inner speech becomes external. People frequently talk to themselves when they face a problem. This externalization of speech is common in children, and adults too when they face perplexing, unfamiliar tasks. When learners work together on complex tasks, they assist each other because dialogue consists of mutual regulation. Together, they can tackle problems that could be difficult if they worked alone.

The third important principle in Vygotsky's theory refers to The Zone of Proximal Development. He states that problem-solving skills in the performance of tasks can be placed into three categories:

* Those performed independently by the learner
* Those that cannot be performed even with help
* Those that fall between the two extremes, those that can be performed with help from others (Gilbreath: 1995, Vygotsky: 1978).

The first category of problem-solving skills refers to tasks that can be performed independently by the learner. Constructivists view the learner as a competent, thinking individual. From constructivist thought it is therefore essential for educators to regard the learner as capable of independence in tasks that are within his cognitive ability. The educator therefore has a duty to nurture the learner's natural curiosity, to provide a rich learning context where inquiry skills are encouraged.

The second category of problem-solving skills are those that are beyond the capability of the learner. Even in instances where help is provided, these tasks are above the cognitive ability of the learner. It is essential for educators to prepare tasks that will not frustrate the learner and lower his self-esteem because they cannot be achieved at his/her level, even with help.

The third category of problem-solving skills are tasks that can be performed with help from others. These are taks within the learner's range of proximal development. This concept is useful for educators in making clear the realisation that educators need to provide tasks that stretch the learner's capability. The role of the educator is to provide the necessary support for the successful accomplishment of those tasks.

2.1.2 **Constructivism and Educational Application**

Constructivists view learning as the result of mental construction. Learners actively take knowledge, connect it to their previously assimilated knowledge and then make this knowledge theirs by constructing their own interpretation (Cheek:1992).

2.1.2.1 **Connecting School Learning to Real Life**

From the idea of mental construction, one realises that meaning is connected to experience. Learners come into the classroom with their own experiences and a cognitive structure based on those experiences. The learner adjusts, or reformulates his/her existing structures if the new information is connected to existing knowledge

in memory. Memorised facts or information that has not been connected with the learner's prior knowledge will be quickly forgotten. Effective educators help learners draw generalizations and construct meaning from their knowledge and experiences. School learning should be connected to real life situations. Knowledge gained from life outside the school is as valuable as knowledge gained from school. It is also useful to involve learners in seeking solutions to real life problems.

2.1.2.2 **Encouraging Learner Autonomy and Initiative**

In constructivist thinking, the learner has an active mind. The educator should avoid using traditional methods of teaching where the teacher is the information giver. He/she becomes one of the many resources that the learner may learn from, not the primary and only source of information. Secondly, it is important to allow leaners to offer useful suggestions for lesson planning and classroom activities. The educator should accept and encourage learner initiation of ideas (Forman and Cazden:1986, Hartman: 1998).

2.1.2.3 **Collaboration and Interaction**

Although constructivist theory emphasizes the learner, learner autonomy and intitiative, it does not view the learner as an individual working in isolation. The learner is capable of indepedent work and self-regulation in the peformance of tasks, yet at the same time, he thrives from a rich social context. Constructivists encourage collaborative classrooms. Successful, self-regulated learners need to engage in dialogue with other learners as well as educators. Educators need to encourage meaningful discussion and questioning in pairs or groups. Learners should confidently challenge each other's conceptualizations and ideas. Collaboratively, learners should seek resources that can be used to perform tasks in the classroom (Cohen: 1986, Tinzmann: 1990).

Effective communication and collaboration are essential to becoming a successful learner. It is mainly through dialogue and examining different perspectives that

learners become knowledgeable and self-determined. Dialogue is a crucial element in constructivist philosophy and the classroom (Forman and Cazden:1986, Tinzmann:1990). It is therefore essential for educators to insist on clear expression of one's ideas from learners. Learners should be able to clearly communicate their understanding to peers and the educator.

2.1.2.4 **Promoting Reflection and Self-Evaluation**

Learners are regarded as competent thinkers in constructivist philosophy. The educator provides a rich learning context where learners are involved in activities that challenge and improve their reflective capacity. Learners should be engaged in meaningful problem-solving activities that relate to real life. Educators should encourage the collection of real evidence to support ideas. Adequate time must be given in instruction for reflection and analysis.

Learners must be able to monitor their progress in the performance of tasks. This is an important metacognitive skill. Self-evaluation means assessing whether one has learned what one was intended to learn, and establishing whether future learning is needed (Tinzmann:1990).

2.1.2.5 **The following ideas on implementing constructivist principles are suggested by Yager (1991):**

1. Seek out and use learner questions and ideas to guide lessons and whole instructional units;
2. Promote learner leadership, collaboration, location of information and taking action as a result of the learning process;
3. Use learner thinking, experiences and interests to drive lessons;
4. Encourage the use of alternative sources of information;
5. Seek out learner ideas before presenting educator ideas;
6. Extend learning beyond the class period, classroom and the school; and
7. Involve learners in seeking information that can be applied in real-life situations.

2.2 METACOGNITION AS A LEARNING STRATEGY

Learning strategies are those behaviours and thought processes used by learners that influence what is learned. They are strategies that learners use to carry out learning tasks:

> The term learning strategies refers to the behaviours and thought processes students use as they carry out learning tasks (Arends: 1997:244).

Learners are often assigned specific learning tasks such as completing a worksheet in reading or writing an essay or a report. Completing these learning tasks requires one to engage in particular thought processes and behaviours such as identifying main ideas, summarizing, looking for relevant information in certain portions of the text, as well as monitoring one's own thinking. In order to perform the learning tasks successfully, students must make use of learning strategies.

2.2.1 Importance of Strategy Instruction

Good teaching is not the mere handing down of information by the educator but it involves teaching learners how to learn, how to approach learning tasks, how to think, how to remember and to successfully complete a given learning task.

Many educators do not appreciate the fact that learners must be trained in learning strategies. It is strange that educators expect students to learn yet seldom teach them about learning. They expect students to solve problems yet seldom teach them about problem solving. And, similarly, they sometimes require students to remember a considerable body of material yet seldom teach them the art of memory. Educators need to develop the general principles of how to learn, how to remember, how to solve problems, and then to develop applied courses, and then to establish the place of these methods in an academic curriculum (Fisher: 1998).

Strategy instruction rests on the understanding that the success of the learner, to a large extent, rests on his/her ability to learn on his/her own and monitor all the

learning processes successfully. This makes it imperative that learning strategies be taught to learners in all levels of the education system. Learners must be exposed to the various learning strategies available and should be trained to know when to use them appropriately (Arends: 1997).

2.3 THE NATURE OF METACOGNITION

Metacognition plays a vital role in the management of thinking and learning:

> Metacognition is thinking about knowing 'what we know' and 'what we don't know'. Just as an executive's job is management of an organization a thinker's job is management of thinking (Blakey and Spence: 1990:1).

Blakey and Spence (1990) maintain that it is vital for a learner to manage his/her thinking because a thinking person is in charge of his/her behaviour. This management of thinking according to them includes the ability to do the following three things:

a. Connecting new information to former knowledge.

When confronted with new information, learners need to make conscious decisions about it. Firstly, they engage in a mental process of checking whether it is "new" information. Secondly, they try and fit it into existing knowledge and it becomes a stable logical part of their understanding.

b. Selecting thinking strategies deliberately.

A thinking person is in direct control of his/her behaviour. He/she selects thinking strategies according to the problem at hand. The individual defines the problem and engages in a search for suitable solutions. This includes monitoring, controlling and judging thinking, evaluating and deciding when the problem is solved to a satisfactory degree.

c. Planning, monitoring and evaluating thinking processes.

Active thinkers assume responsibility for planning their activities. The ability to think actively and make plans leads to a systematic approach to problem-solving. They become more self-directed as they monitor and regulate their thinking in line with the tasks to be accomplished.

2.3.1 **The Two Components of Metacognition**

The term "metacognition" is most often associated with John Flavell (Flavell: 1976, 1977, 1979). The following definition illustrates that the term has two components. It includes the following:

> . . . one's knowledge concerning one's own cognitive processes and products or anything related to them . . . Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objective on which they bear, usually in the service of some concrete goal or objective (Flavell: 1976:232).

The term "metacognition" is used to refer to two related abilities. One concerns having explicit knowledge of learning strategies - cognitive processes, thinking processes. The other concerns the ability to actively monitor, regulate or control one's own thinking and learning. Restricting our understanding of the term to either knowledge alone or regulating and monitoring alone would not do justice to the broad richness of this complex term (Stevenson and Palmer: 1994). This study focuses on the learner's ability to monitor and regulate his/her thinking and learning processes in order to complete learning tasks independently.

2.3.1.1 **Metacognitive knowledge**

Paris (1970) suggested that good learners have three types of knowledge about learning strategies:

i. Knowledge of what learning strategy to use

For instance a good learner would know that when faced with comprehension difficulties in reading a text he/she should adopt a re-reading strategy.

ii. Knowledge of how to use a strategy

Good learners know that underlining key ideas would help them in summarizing a text.

iii. Knowledge of when to use a strategy

The choice of a particular strategy depends on the task requirements. Underlining certain sections of the text may be useful in identifying key ideas but not quite relevant when reading for fun. Strategies also differ according to learning areas or subject areas.

It is important for learners to be equipped with this knowledge. Studies conducted in the area of reading ability provide good evidence to support this assertion. Forrest-Pressley, Mackinnon and Waller (1984) found that good readers and not poor readers could report the strategies that they used when faced with comprehension difficulties.

Spring (1985) asked two groups of first-year college students identified as good and poor readers to complete a reading strategy questionnaire. Some of his results indicated that many readers fail to engage in the strategies needed for successful learning. Poor readers neglected them altogether, while good readers used some but not the full range of strategies available. The failure of poor readers to use strategies may be attributed to a lack of knowledge on reading and comprehension strategies.

Mikulecky and Ehlinger (1986) studied the metacognitive aspects of literacy on the job performance of electronics technicians and found out that the knowledge and use of metacognitive strategies such as self-interrogation, focusing on key ideas, setting goals were common among technicians who were superior performers than among the average to low performers.

Although the knowledge of strategies is a useful component of metacognition, the mere knowledge of them does not guarantee use. It is possible for learners to possess the knowledge and not use the strategies. What is required therefore is the knowledge as well as the ability to monitor and control one's performance (Stevenson and Palmer: 1994). In this study, teaching strategies that help learners to monitor and control their performance were explored in order to ascertain their effectiveness in developing metacognition in learners.

2.3.1.2 **Metacognitive Monitoring and Control**

The learner's ability to select, use and monitor learning strategies that are appropriate for the situation at hand is important for success in the teaching-learning context. Monitoring and control of cognitive processes involve the use of metacognitive strategies or metacognitive regulation. These processes help to regulate and oversee learning. They include planning, monitoring and evaluating activities. For example, after reading a paragraph in a text a learner may question himself/herself about the concepts discussed in the paragraph. The cognitive goal would be to understand the text. Self-questioning is a common metacognitive comprehension monitoring strategy. If the learner finds that he/she cannot answer the questions, or does not understand the material discussed, he/she must them determine what needs to be done to meet the cognitive goal of understanding the text. He/she may decide to write short notes on the key ideas.

A good example of the importance of monitoring and control is illustrated in Brown and Day's study (1983) on summarizing skills. In order for a learner to summarize a given passage, he/she needs to monitor and control his/her comprehension of the passage. He/she needs to employ identifiable learning strategies that good summarizers use.

Brown and Day (1983) studied students and experts while reading and constructing summaries of what they had read. They identified six strategies that good summarizers use. Brown and Day went on to teach students how to use these

strategies.

The results showed that with all three methods, students improved their ability to select and invent topic sentences. However, in the group that was trained in metacognitive monitoring and control, the training was particularly effective with poor learners and difficult material. It is therefore important to note from this study that the metacognitive ability to monitor and regulate strategies is particularly important when learners are having difficulty in comprehending and learning. It is therefore useful to possess the ability to monitor and control one's learning when difficulties are encountered by employing useful strategies. This study made use of some of Brown and Day's suggestions on useful metacognitive strategies.

Garner (1990) has suggested that poor metacognitive monitoring is the main reasoning behind the failure of weak learners. If learners do not realise they are not learning or they cannot adequately tell whether they are learning or not, they are unlikely to seek suitable remedies or learning strategies.

Metacognitive control and monitoring therefore is useful in the sense that the learner is able to keep track of what he or she is doing when solving problems. He or she then successfully uses this input from those observations to guide his/her behaviour in problem solving.

2.3.2 **Active Monitoring of Thoughts and Actions**

In order to establish the presence or absence of metacognitive ability in learners it is crucial to work out what thought patterns and resultant activities characterise learners who possess metacognitive skills.

Metacognition, or the act of thinking about one's own thinking, is necessary to ensure efficient learning. Dirkes (1985) points out that learners who direct their own thinking commonly do three things: connect new information to former knowledge; select thinking abilities directly; and relate time and degrees to certainty of purpose. These

activities are known as executive strategies. The learner who is able to plan, monitor and assess learning activities demonstrates metacognitive awareness.

The ability to know what one does not know is an important aspect of metacognition.

> Some people are unaware of their own thinking process. They are unable to describe the steps or strategies they use during the act of problem-solving. They cannot transform into words the visual images held in their minds. They seldom evaluate the quality of their own thinking skills (Ganz and Ganz 1990:180).

One can see therefore that in order to take appropriate, relevant steps in solving problems related to specific learning tasks, it is important to keep track of your thinking processes and actions and to adjust them according to requirements of the task at hand.

Metacognition consists of three basic elements:

a. The ability to develop a plan of action
b. Monitoring the plan
c. Evaluating the plan

The learner who possesses metacognitive awareness would ask himself/herself the following questions before developing a plan of action:

* What prior knowledge will help me with this particular task?
* In what direction do I want to think?
* What should I do first?
* Why am I reading this section?
* How much time do I have to complete the task?

In the process of carrying out the learning task the learner with metacognitive skills would ask the following questions:

* How am I doing?
* Am I on the right track?
* If not, what must I do to register progress?
* How should I proceed?
* Should I move in a different direction?
* Should I adjust my pace?
* What do I need to do if I do not understand?

After the completion of the task this learner would consider the following questions when evaluating his/her plan of action:

* How well did I do?
* Did my particular course of thinking produce more or less than I had expected?
* What could I have done differently?
* Do I need to cancel and redo certain sections of this task?

(North Central Regional Education Laboratory: 1995)

Huitt (1997) states that the learner who has metacognitive skills has the ability to ask himself/herself and answer the following types of questions:

* What do I know about this subject, topic, paragraph?
* Do I know what I need to know?
* Do I know where I can get information to carry out this task?
* How much time do I need to learn this?
* What strategies and techniques can I use to complete the task?
* Did I understand what I just heard or read?
* How will I know if I am learning at an appropriate rate?
* How can I spot an error if I make one?
* How should I revise my plan if it is not working to my satisfaction?

(Huitt: 1997)

In this study, learners were taken through a series of these steps in order to establish the importance of these factors in developing metacognition.

2.3.3 **Purposeful Approach to Learning Activities**

Brown and Day (1983) state that one of the best ways to distinguish learners who possess metacognitive ability from those who do not is to look at the difference between what efficient, mature learners do and weak learners do in the process of carrying out learning tasks. Learners who possess metacognitive skills approach learning tasks in a strategic and purposeful way. They think about and select appropriate strategies that lead to a systematic, step-by-step approach when carrying out the learning task. Weak learners on the other hand, do not consciously seek suitable strategies when faced with a learning task. They randomly come up with haphazard, random inferior and inefficient strategies that result in partial or no success at all.

Learners who have developed metacognitive skills are able to describe how they intend to approach a task, what they think about the problem at hand, their mental organisation and future strategies regarding the problem. Weak learners adopt a passive helpless attitude that leads to failure to take control over a learning situation. This approach results in incomplete tasks, failure and very low self-esteem (Scheid: 1993, Riding and Powell: 1994).

In this study, learners who were given instruction using metacognitive strategies were tested in order to establish their ability to select and use appropriate strategies in learning tasks.

2.4 **RESEARCH ON METACOGNITION**

A greater understanding of metacognition can be gained by knowing how it has been investigated. For a lot of people, metacognition is a complex term. Metacognition by its very nature is a "fuzzy concept" It has been made fuzzier by a widening circle of research that has come from researchers of widely varying disciplines (Flavell: 1977).

The purpose of this section is to describe the characteristics of metacognition that have remained relatively constant across disciplines. Hopefully, the relevance of the concept "metacognition" in education will be made clear by a move from theoretical to practical application in the classroom.

2.4.1 A Historical Survey of Metacognition

2.4.1.1 Early Investigations on Metacognition; 1920's to 1950's

Most of the early investigations on cognition were concerned with cognitive growth. The main aim of these studies was to describe general developmental patterns of children's knowledge about memory processes. They examined and classified the cycle of intellectual growth. The work of Jean Piaget, a Swiss psychologist and biologist is significant in this group of early studies on cognitive development and mental processes in young children (Piaget:1929).

Piaget's studies focused on the developmental stages and specific cognitive skills and he used his own children as study objects. He explored child performances through various observations of language and thought development, reasoning applications and moral judgement (Piaget:1926a, 1926b, 1929). Piaget's objective was to record the cognitive abilities of children at various ages and attempt to discover the cause for this intellectual growth.

The studies illustrated early metacognitive activity in children without the use of metacognitive terminology. Piaget studied the organization of children's thought patterns and processes and he described this cognitive activity as an evolving adaptation of thought to the environment. In this adaptation process the child modifies existing thought processes as he or she reacts to environmental influences.

The child is in the active process of seeking to reach a state of equilibrium in the new environment. Piaget felt that the child's major goal in cognitive activity is always directed towards equalizing outside activity and to digest new information into logical

and stable patterns of understanding. For Piaget, the young child is capable of directing cognition, but is not conscious of the mental or thought processes he/she goes through (Piaget:1926b). In his later research conducted in 1976, Piaget described the learner's ability, at the age of seven to eleven years, to verbalize the actual step-by-step processes he/she used to complete given tasks. One sees this awareness of cognitive processes as linked to metacognition.

During the period of Piaget's research on cognitive development and mental processes, Lev Vygotsky in Russia undertook studies in the area of cognitive processes. His main focus was on determining the source of intellectual development. According to Vygotsky (1962, 1978) the social context is crucial for cognitive development. A learner's cognitive development is derived from contact with higher-level abstract subject matter imposed by higher level social interaction. The significant people in the learner's life affect his/her mental and language development and these include parents and the educators. Vygotsky (1978) maintained that the presentation of advanced information by an individual with higher - order thinking skills facilitates the development of advanced abstract cognitive processes in the learner.

Vygotsky described what he termed "tools" for cognitive development. He identified language as one such tool. Children make sense of any task with the use of speech as a tool, often verbalising a situation to make sense out of it and then taking in the speech into their thought processes. Individuals use this private inner language/voice to think. Speech is a tool to regulate one's thinking (Vygotsky: 1962, 1978). In Vygotsky's ideas one notes the metacognitive processes of monitoring and regulating one's thought processes by using speech.

One recognises that both Piaget and Vygotsky initiated a focus on thinking processes in the 1930's.

2.4.1.2 Studies of Cognitive Monitoring in the 1960's to 1980's

The ability to monitor one's knowledge and thought processes is crucial in education. It is important for a learner to conduct an accurate self-assessment of what he/she knows and what he/she does not know.

In the mid - 60s Hart investigated people's accuracy in monitoring their stored knowledge (Hart:1965). He asked undergraduate students to recall answers to a collection of general information questions that were drawn from a variety of subject areas. Using items from the answers that students got wrong, Hart asked them to make "Feeling-Of-Knowing" (FOK) judgements about whether they would be able to recognize the correct answers from among several wrong answers. Students were then given a multiple choice test and asked to recognize each correct answer. Their accuracy in monitoring their knowledge could be determined by comparing their FOK judgements with recognition performance. From his study Hart concluded that feeling-of-knowing judgements for the undergraduate students were relatively accurate indicators of what is or is not stored in memory.

Flavell (1971) used serial recall in young children to study cognitive monitoring. They studied preschoolers to fourth graders. Learners were shown pictures of familiar objects briefly and then they were given longer sequences of these objects. The learners were asked to predict whether they could recall the pictures in correct serial order. Their responses showed that older children could hold more pictures in memory and were more accurate in their predicted recall than younger children. The younger children overestimated their recall ability. One sees a developmental pattern in this study: with increasing age, knowledge about what is or is not stored in memory becomes increasingly accurate.

Bisanz, Vesonder and Voss (1978), in a related study on developmental patterns and cognitive monitoring, showed that there are developmental differences between first to third grade learners and older children (fifth grade and college students) in the ability to monitor current knowledge in memory.

In this study, the researchers asked student to learn lists of picture pairs. Each student was tested on his/her knowledge of picture pairs by presenting one picture from each pair to serve as a cue for recalling the second picture. All the picture pairs were tested and then students were asked to study all of the picture pairs until they got them right. They were again given a chance to look at each of the picture pairs and indicate whether they thought they got it right. All of the picture pairs were restudied and then students were retested (Bisanz et al:1978).

Results of this study showed that first graders had more false positives than older children (they thought they got a pair correct when in actual fact they had not). As in Flavell's study (1971), it was concluded that cognitive monitoring ability increased with age.

2.4.1.2.1 **Flavell's Contribution (1970 - 1981)**

Flavell (1971, 1976, 1977, 1979) has been credited with the origination of the term "metacognition". For Flavell, metacognition is an awareness of oneself as an active thinker. What is basic to metacognition is the awareness of one's thoughts and processes. Those thoughts can be of what one knows (metacognitive knowledge), what one is currently doing, or what one's current cognitive state is. Metacognitive thoughts are deliberate, intentional, goal-directed and future-oriented mental behaviours that can be used to monitor the accomplishment of tasks.

Flavell (1979)'s model of metacognition and cognitive monitoring states that a person's ability to control a wide range of mental activities occurs through the interaction of four classes of phenomena:

a. metacognitive knowledge
b. metacognitive experiences
c. goals (tasks)
d. strategies

Metacognitive knowledge consists of one's knowledge about oneself as a cognitive processor, plus a task and its demands and also strategies for accomplishing the task. It is the conscious consideration of success or failure in learning - for instance, having a feeling of confusion after reading a passage. The goals or tasks of metacognition are the actual objectives of mental pursuit such as reading. Metacognitive strategies refer to the specific techniques used to assist one in understanding. For instance, underlining the key words is known to increase comprehension.

Flavell's studies in the 70s led to a more refined interpretation of metacognition and its role in problem-solving. He also contributed to an understanding of metamemory. Metamemory, a component of metacognition, is the control of memory functions - the ability of the mind to purposefully store and retrieve information. Flavell (1971) was the first to recognize that specific strategies for remembering like memorizing, recalling and categorizing can be learnt.

Flavell's contributions have led to a number of significant studies in the area of metacognition.

2.4.1.3 **A Study of Cognitive Monitoring and Regulation**

Another category of metacognitive research includes studies that focused on the regulation of one's thinking processes so that one is able to cope with changing situational demands (Kluwe:1982). Kluwe's study was on the use of training strategies related to the accomplishment of learning tasks.

The study included a training task and a strategy transfer task. (The strategy transfer task was structurally similar to the training task but was different from it in every sense). Research participants were taught a strategy to complete a task. Tasks used in the study included word or picture association, letter completion, alphabet search and free recall. When the participants mastered the use of a strategy, a transfer strategy was used to check whether they used the strategy, modified it or abandoned

it in the completion of a given task. The purpose of this study was to determine whether people who are trained in learning strategies can regulate and modify their use in new contexts. Results indicated that participants could regulate and modify learning strategies to suit the demands of new tasks.

Schneider (1985) conducted a study where students were first taught to use sentence - elaboration and repetition strategies to learn vocabulary words. This study belongs to a category of metacognitive research that examines how people regulate their selection of strategies based on information they monitor while employing the strategies. Research participants were considered to have monitored and regulated their use of strategies if, after using the strategies, they could select the most effective one for further use.

The students were taught two strategies and after the two were learned, they were asked to choose the more effective strategy to learn a list of new vocabulary words. One group was allowed to practise but not the other. Results showed that in the absence of practice, students were more likely to choose the strategy that was recommended by the experimenter. With practice, students were more likely to choose an effective strategy that works for them. One realises that through practice, students develop an awareness on monitoring the use of different strategies and selecting an effective one for the successful accomplishment of tasks.

2.4.2 Research on Metacognition and its Relation to Comprehension and Summarisation

From the mid 1980s much of the metacognitive research shifted its focus to educational environments. Studies focused on whether instruction of metacognitive processes such as planning, monitoring one's comprehension, self-questioning, self-evaluation could facilitate learning.

In the area of comprehension in reading, a number of metacognitive strategies are used to integrate information on the text. Text comprehension involves understanding

what has been read and using it in different contexts. Summarizing uses comprehension strategies that enable one to synthesize information. Brown and Day (1983) attempted to study metacognitive strategies that good summarizers use. They studied students and expert summarizers while they were reading and constructing summaries of what had been read. They identified the following summarizing rules as effective:

* Deletion of trivial material
* Deletion of other material that is important but redundant
* Substitution of superordinate terms
  - replacing a list of items with one term
  - replacing a sequence of actions with one single action
* Topic identification
  - selection of a topic sentence
  - inventing a topic sentence

They also examined the use of these strategies by eleven year olds, thirteen year olds and sixteen year olds. Results indicated clear developmental differences in the ability to use them. Deletion strategies were used by all subjects. Substitution strategies and topic sentence selection increased with age. Topic invention was difficult for all age groups. The study showed that students do not always use good summarising strategies.

Brown and Day (1983) proceeded to teach students how to use metacognitive strategies that could lead to good summarising skills. They used three different teaching methods but only the third one involved training students on metacognitive regulation and control of learning. The following methods were used:

* Method 1: "Blind" instruction: The students were told what to do. They were encouraged to write good summaries by identifying the main ideas and leaving out trivial material and all redundant ideas. The students were not given any rules on how to achieve this.

* Method 2: "Informed" instruction: The students were told what to do and how to do it. The same method in (1) was used but in addition, six rules for summarising were provided.

* Method 3: Metacognitive training: The same methods were as in (2) but students were given explicit training on how to monitor and control the rules. Students were taught how to monitor and evaluate their ongoing performance. They learnt how to regulate and control their performance in the use of metacognitive strategies. Students were shown how to check that redundancies and trivia had been deleted, and how to work out superordinates and select or invent a topic sentence.

Results obtained from the study showed that with all three methods students improved their ability to select or invent topic sentences. However, the metacognitive training was particularly effective with less proficient students and with more difficult texts. This study brings out the realization that when students fail to monitor their comprehension and regulate their strategies to suit the situation, particularly those who battle with reading and comprehension, they could benefit from metacognitive training.

Rottman and Cross (1990) taught third and fourth grade students with learning disabilities five Informed Strategies for Learning (ISL) and these were:

a. evaluating the reading task;
b. defining main ideas;
c. summarising story elements;
d. making inferences; and
e. using prior knowledge

In the first module, students were told what they should know when they finished

reading. The knowledge was metacognitive because it clarified the task demands of reading. In the third module, summarising story elements, students were told that the summarization strategy would increase their comprehension. In the fifth module, using prior knowledge, students were told how to relate prior knowledge to text information. In all of the modules, students had options for selecting and employing strategies.

A new Informed Strategy for Learning was introduced each week during three daily forty-five minute periods. In each instructional period, students were given (a) instruction on the weekly ISL, (b) time to think about the ISL for the day, (c) opportunities to use the ISL for answering questions on a given passage, and (d) feedback on selection and application options. Reading comprehension was measured weekly using oral comprehension tests and summarisation questions. Reading awareness was measured before and after the study.

Results showed that students' overall comprehension and performance on main ideas, using inferences, prior knowledge and awareness measures were affected positively by the ISL interventions. However, the main limitation of this study was that control groups were not provided.

Schunk and Rice (1992) conducted a study to investigate whether strategy instruction on main ideas would be more effective for remedial readers if they were taught the usefulness of strategy instruction. Five steps were included in the main ideas strategy and these required students to do the following:

a. Read the passage questions;
b. Read the passage to determine what it was about;
c. Think about the passage details;
d. Think about a suitable title; and
e. Reread critical parts of the passage if they did not know the answers.

Before implementing the main idea strategy, students were required to ask

themselves the question, "What do I have to do?" and say the strategy step.

In this study, thirty-three fourth and fifth grade remedial readers were randomly assigned to one of three conditions:

a. Comprehension instruction without the strategy.
b. Strategy instruction on main ideas.
c. Strategy and comprehension only groups who performed comparably.

Data obtained from the study indicated that strategy instruction was useful for remedial readers if metacognitive training was provided (Schunk and Rice:1992).

Malone and Mastropieri (1992) investigated the use of metacognitive training strategies like self-monitoring in summarisation. Students were required to go through three steps:

a. Determine who or what the paragraph was about.
b. Determine what happened.
c. Write a summary sentence using steps (a) and (b).

Self-monitoring included checking off summarisation steps using a prepared self-monitoring checklist.

Forty-five students with learning disabilities were randomly assigned to one of three instructional conditions:

a. Traditional comprehension
b. Summarisation
c. Summarisation plus self-monitoring metacognitive training

All students received two days of instruction. Students in group (c) performed significantly better on three comprehension measures.

A synthesis of the research studies on metacognition in education and its relation to comprehension and summarisation skills discussed in this section reported the positive effects of metacognitive training strategies on students' reading comprehension and summarisation.

In all the studies several metacognitive strategies were used on learners like planning, monitoring, and re-reading to remediate reading failures. However, it is worth noting that the effect of each strategy was not measured to indicate whether some metacognitive strategies are related more strongly to comprehension and summarisation when combined than when used individually.

Secondly, in some of the studies already discussed adequate experimental control was not demonstrated as in the Rottman and Cross study (1990).

Thirdly, the studies discussed in the section were done on students with learning disabilities and remedial groups or learners with reading problems.

The above-mentioned reasons contributed to particular methodological considerations of this research project. The question of experimental control was addressed. Secondly, the research concentrated on mixed-ability groups of second language learners of English. However, as in the previous studies, the metacognitive training strategies were combined to test the overall effect of all the strategies.

2.4.3 Unresolved Issues: Research on Metacognition in Education

2.4.3.1 Definition

Metacognition is a term that is influenced by contributions of many disciplines (psychology, sociology and education). Since metacognition derives from various disciplines and is a fairly new term, definitional variations abound. The term therefore covers a multiplicity of components that vary in scope, purpose and dimension. Metacognitive strategy applications therefore vary in scope and dimension in all

studies (Brown:1987).

2.4.3.2 Measurement

Apart from definitional problems, variations exist in methods used to measure metacognition. Adults, as well as young children, normally have problems reporting thinking processes. Researchers have to rely on written responses to comprehension and summarisation and these do not adequately demonstrate the use of metacognitive processes like self-questioning, and self-monitoring. It is also difficult to determine "how much" metacognition is sufficient to design effective instruction for learners. More research is required to clearly specify essential features of effective metacognitive instruction and the exact combinations that lead to success in learning.

2.4.3.3 Instructional Time

The amount of time allocated for metacognitive instruction is not resolved. Instructional time used varied in all studies. The shortest intervention is one lesson and some studies go up to six months (Paris, Wasik and Turner:1991). Because of varied times used for instruction in studies, it is difficult to determine an optimal time to allocate for instruction. Further research is required to clearly define a time perspective for metacognitive instruction.

2.4.4 Areas of Convergence on Metacognitive Instruction in Education

2.4.4.1 Metacognition and Reading Comprehension

A review of literature examining the relationship between metacognitive instruction and comprehension and summarisation shows a number of areas of convergence. Firstly, in the reviewed studies, metacognitive instruction facilitates reading comprehension (Rottman and Cross:1990; Brown and Day:1983, Malone and Mastropieri:1992; and Schunk and Rice:1992).

Secondly, the studies also identify a number of metacognitive components as effective in metacognitive instruction. These components include planning, goa-setting, self-monitoring, self-questioning, modelling, interaction/collaboration, and guided practice.

2.4.4.2 **Research on Metacognition in South Africa.**

Research on metacognition in South Africa has focused on metacognition in diverse contexts. Some studies have focused on metacognitive ability in professional competence (Mambanda:1998, Sagor:1999). A number of studies used students with learning disabilities, for example (Kaplan:1990, Lategan:1995). The third category of studies concentrated on mixed ability learners in secondary schools (Topham:1992, Mahuma:1996).

Sagor (1999) explored the metacognitive processes of a group of junior primary educators. The major focus of the study was to develop metacognitive awareness in educators as a necessary prerequisite for metacognitive instruction to occur in the classroom. Metacognitive awareness was initiated in the educators.

Mambanda (1998) studied the effect of metacognition on the academic achievement of nursing students. Results obtained from the empirical investigation showed that students who manage, evaluate, monitor their learning tasks are better achievers than their counterparts.

Masureik-berger (1995) investigated metacognitive strategies for learning disabled adolescents. Through the use of metacognitive training strategies, disabled learners were assisted to become more involved in their studies, their scores improved as well as their motivation and self-esteem.

Topham (1992) studied metacognition and related factors in secondary school learners' approaches to learning. The researcher hypothesized that metacognitive training and positive support would encourage learners to apply deeper learning

approaches to problem-solving. Results obtained from the study supported the hypothesis. In a related study, Mahuma (1996) used an empirical investigation to determine whether metacognition and related factors have an influence on the academic achievement of Standard 10 Biology students. It was concluded that metacognition influenced academic achievement with reference to self-testing.

Results obtained from the studies discussed suggest consensus on the assertion that metacognitive teaching strategies have a positive influence on the academic achievement of learners. However, each study has a specific area of focus in the broad and complex field of metacognition. Mambanda (1998) and Sagor (1999) concentrated in metacognition as it relates to competence in professional fields, namely nursing and teaching respectively. The second category of research focused on students with learning abilities (Masureik-berger:1995). This study belongs to the third category of researchers who studied secondary school, mixed ability groups.

Each study on metacognition is unique in the sense that it uses selected components in the wide field of metacognition. The main contribution of this study lies in area of focus, the use of metacognitive teaching strategies in the teaching of summarisation skills to second language speakers of English in the North West Province of South Africa.

2.5 TEACHING STRATEGIES THAT STIFLE METACOGNITIVE ABILITY

2.5.1 Excessive use of Chalk and Talk Methods: The Didactic Method

Researchers who study classroom discourse, after working from a variety of perspectives and using diverse methods, have found that most educators talk a great deal in classrooms. Educators adopt teaching strategies that consist of constant teacher talk and asking questions. Researchers have found that this pattern of teaching is not the best one for promoting student thinking (Arends: 1991, MacDonald: 1990, Nunan: 1988, 1992, Wiens: 1983, Paris and Winograd: 1990).

Paulo Friere launched the following attack on the traditional, didactic, jug-and-mug technique:

> A careful analysis of the teacher-student relationship at any level, inside or outside the school, reveals its fundamentally narrative character. This relationship involves a narrating subject (the teacher) and patient, listening objects (the students). The contents ... tend in the process of being narrated to become lifeless and petrified. Education is suffering from narration sickness ... (Friere: 1972: 57).

Excessive use of 'chalk and talk' method can lead to passive, lifeless learners. However, he maintains that the sad reality is that this type of teaching prevails in most countries. In South Africa, this type of teaching still prevails as a heritage from the old system of education.

Bishop (1985) argues that reliance on the didactic "jug and mug" technique of teaching, over-reliance on dictation of "notes" or blindly copying notes from the blackboard and emphasis on rote memorisation are practices that do not promote learning. Such methods cannot develop learners who are self-regulated, active thinkers.

The traditional teaching method where the educator is the sole information - giver in a class of silent learners has been linked to the creation of passive learners.

When educators engage in long sessions of teacher-talk, they deprive learners the opportunity to interact with the information given by the educator through other activities with peers. Instruction that emphasizes memorisation and the learning of answers more than the exploration of questions does not develop critical thought in learners. The didactic method also fails to encourage learners to work together, to share ideas and information, in other words, to engage in dialogue and collaboration that is essential for their cognitive development (Caprio:1994, Stenberg: 1998).

content while metacognitive approaches require learners to use this content critically to develop broader and more meaningful knowledge and skills. In didactic methods, the educator is action oriented while in metacognitive, self-regulated learning approaches, the learner is action oriented (Pesut:1990).

Educator-directed learning that is characteristic of didactic methods creates submissive, conforming learners who are reliant on authority for decisions. Such learners project great dependence on the educator for direction. They are not capable of independent, self-regulated learning because of a learning environment where knowledge dictated by the authority figure is regarded as unquestionable truth. Learning is usually directed towards a specific section of academic knowledge. Sometimes, there is also great dependence on the text book and prescribed subject matter (Mosston:1972, Macdonald:1990).

One realises that the didactic method deprives learners of a chance to plan and organise their learning tasks, to engage in self-instruction and self-evaluation as they monitor their progress in learning tasks. Through the processes of self-regulation, self-evaluation and self-reinforcement, learners are able to develop metacognitive knowledge and experiences. They develop effective skills in understanding how to regulate or monitor their behaviour when faced with identifiable academic goals.

Metacognitive teaching approaches help the learner to plan, monitor and evaluate his/her understanding in the accomplishment of tasks. They promote originality and freedom in individual expression of ideas, and give the learner decision-making skills, self-reliance and a sense of responsibility for his/her own learning. Ultimately learners become mature, autonomous and self-regulated (Scruggs: 1985, Thomas: 1979, Wenden: 1991, Zimmerman: 1994).

2.6 STRATEGIES FOR DEVELOPING METACOGNITIVE BEHAVIOURS IN LEARNING

In this rapidly changing world, the challenge of teaching is to help learners develop

skills which will not become obsolete. Educators need to come up with teaching strategies and educative environments which foster the development of good thinkers who are successful problem solvers. Metacognitive strategies are essential for learners who will deal with the complex world of the twenty-first century.

The aim of promoting metacognition in learners is to develop mental self-management and independence in learning. The idea is to develop thinking persons who direct and control their thinking and actions in the learning situation. Martin(1991) points out that educators can be successful in developing metacognitive skills in learners if they can develop good habits in learners:

> The key to success in any activity is to develop effective skills. Athletes develop athletic skills; musicians develop musical skills; managers develop managing skills. Learners need to develop learning skills. Developing skills means building good habits (Martin: 1991:1).

In an attempt to make learners pass examinations, many educators focus on imparting information, rather than developing learning skills in learners. For many learners, learning is an endless attempt to memorize new information and concepts.

Martin (1991) has outlined a number of useful habits that lead to success in learning. The first habit is that of mental self-management. He points out that learners need to develop the art of planning, monitoring and evaluating their thinking and learning activities.

Secondly, learners must develop the habit of positive thinking. This habit is useful because it increases confidence and self-esteem. Learners should use this habit for setting goals and finding satisfaction in the successful accomplishment of these goals.

The third important habit that Martin outlines is that of creative, critical thinking. This ability is useful for making decisions and problem solving. Fourthly, Martin insists that learners should be given practice in developing the habit of hierarchical thinking. Opportunities for setting priorities and for time management should be constantly

used in instruction.

Finally, he identifies the habit of asking questions as a particularly useful habit to develop in learners. Learners develop the art of self-evaluation by constant self-interrogation.

Martin's ideas provide a useful starting point on the whole question of useful metacognitive strategies that educators can use to develop self-regulated, autonomous learners, which is the main objective of this study.

2.6.1 **Planning and Self-regulation**

Learners must assume increasing responsibility for planning and regulating their learning. Learners will not be self-directed when all the processes of learning are planned and monitored by someone else (Blakey and Spence: 1990, Landine and Stewart: 1998).

It is possible for educators to give learners opportunities to make plans for learning activities. For instance, it is useful to make learners think about and note the procedures or steps they intend to follow when carrying out a learning task. This involves scheduling procedures necessary to complete that particular activity. Learners can be given opportunities to organize materials for completing group tasks.

Assignments and homework should promote the goals of self-regulated learning. Learners should perceive their assignments as more than just tasks to be done. Independent work in the form of assignments and homework provide opportunities for learners to independently practice the use of learning strategies (Blakey and Spence: 1990).

2.6.1.1 **Goal Setting**

Learners prepare for learning in various ways. Most of the time it is the responsibility

of the educator to prepare learners for learning. However if the educator involves learners in goal setting, a critical process that helps guide many other learning activities, they learn to make decisions. Although educators still set goals for learners, it is vital to provide opportunities in instruction where learners learn to set goals. This could be achieved at an individual level or teamwork. For instance, individual learners could work on areas of weakness in the subject. They could identify such areas, set goals and plan learning tasks. In the accomplishment of these tasks, they monitor their progress. After learning, they assess their performance and plan for future learning. The researcher undertook an observation visit to a private school in Mafikeng in the North West Province of South Africa. What follows is a description of selected aspects of the curriculum by the researcher, based on the information provided in an interview with the class supervisor at the school.

2.6.1.2 Lessons from the "School of Tomorrow": Kingsway School, Mafikeng, North West Province of South Africa

Learners have a curriculum that is learner-centred. The coursework for each level is divided into paces. In each school term the learner has a number of paces to complete to achieve an honour's roll.

2.6.1.2.1 Goal Setting and Self-regulation

Each week learners have to complete a weekly goal chart individually. The learner makes decisions on what work he or she has to cover per week to achieve the desired outcomes for the term. This is done for each subject the learner has to cover in each term. Apart from the weekly goal chart, learners have to set goals for the next day at the end of each day. This includes providing homework and daily goals. Each morning the class monitor goes around the class to check whether each learner has completed his or her goals the previous day. At the end of the day the class monitor records each learner's homework. The class supervisor or educator is a facilitator of the learning process. He/she is able to check, at a glance, how each learner manages his/her daily goals. The following is an example of a weekly goal

chart that is used at the school:

SCHOOL OF TOMORROW: GOAL CHART

	MATHS	ENGLISH	GEO	SCIENCE	HISTORY	
M						
T						
W						
TH						
F						

GOALS A____ C_____E_____ BOOK REPORT Oral _____ Written _____

For demonstrating responsibility, check your schedule each morning and mark off as completed. As you complete each subject, put up new goals for the next day.

[Weekly Goal Chart Designed by Kingsway School]

A close analysis of this schedule shows that regardless of ability level, each learner receives practice in taking responsibility for his or her own learning. By setting goals and working out time schedules for the accomplishment of these goals, the learner is directly in control of his/her own learning process. Each learner is encouraged to view himself or herself as competent and self-determined and he/she is likely to assume more and more responsibility for his/her own learning.

2.6.1.3 Opportunities for Planning and Self-regulation in Instruction

The planning activities given to learners in the school of tomorrow, Kingsway school in Mafikeng give educators a glimpse of what is possible to help learners become self-directed and self-regulated.

For each subject there are various ways of involving learners in planning activities. One way of giving learners a chance to plan and engage in self-directed growth is to

assessment strategy or test to be used to check improvement in performance. The following is an example of a language skills contract:

2.6.1.3.1 Language Skills Contract

Name : Jane Austin
Class : 9A
Date : 10 August 2000

Skill Area for Improvement	Proposed Activities - What You are Going to do	Proposed Resourses - What You are Going to Use	Self-Assessment - How You are Going to Test Yourself
1. Essay writing (a) Improve my planning of essays	1. Plan essay on many topics. 2. Write one essay per week.	1. Help from Tutor. 2. Advanced English Bk4.	1. Tutor to check my essay. 2. Mark my essay before giving it to a friend to check.

(Tudor:1996)

2.6.2 Self-Regulation and Self-Monitoring Activities in Instruction

It is important for educators to engage learners in activities that consciously identify what they know and what they don't know during instruction. Blakey and Spence (1990) maintain that one useful strategy for developing metacognition in learners is to teach them to make conscious decisions about their knowledge. When learners make a conscious efffort to check what they know and identify elements that they are not sure of, they are engaging in a useful metacognitive process of self-monitoring.

2.6.2.1 Brain-storming

A number of strategies can be identified as useful in helping learners to check on their understanding during instruction. Brain-storming is a useful activity that could

help learners to consciously demonstrate and clarify what they know (Stenberg: 1998).

2.6.2.2 **Self-Questioning**

It is possible for educators to introduce self-questioning lists as part of reading in the classroom. Such lists would help learners to check on reading failures and seek suitable remediation activities to restore comprehension ability like re-reading, underlining key sections, or paying closer attention to certain sections in the text (Andre and Anderson: 1979, Williamson: 1996).

Metacognitive ability enables learners to apply the critical ability to analyze thoughts and action. For the uncritical thinker, thoughts and the ability or failure to complete a task are "just there". Self-questioning is an important metacognitive skills.

> Self-questionining ... is a metacognitive process which enables students to become independent in their understanding of the text, because they are activiely engaged through goal-directed, organized thinking (Williamson 1996:31)

By asking questions learners can monitor themselves, assess feelings of understanding or lack of understanding in order to employ appropriate self-correction strategies. Learners need to establish whether they should reread, reduce their speed, find help or choose a different strategy (Andre and Anderson: 1979, Baker: 1991, Stenberg: 1998).

Such questions could include the following:

* Should I slow down here?
* Did this make sense?
* Did I get what the author is saying here?
* Can I say this is my own words?
* What does this word mean?

(Ganz and Ganz:1990)

This type of introspection is crucial because the selection and employment of correction strategies is based upon it. It leads to an effective monitoring of learning processes. In this study, the usefulness of self-questioning in helping learners to manage learning tasks was investigated.

2.6.3 **Critical Thinking and Metacognitive Ability in the Classroom**

One of the main goals of learning is to develop higher level thinking skills necessary for an informed society. Educators need to help learners to make choices and decisions that are based on careful critical thinking.

The ability to think critically is a metacognitive component that is useful in metacognitive processes like goal-setting, planning and self-regulation. The ability to think critically helps the learners to engage in logical, reflective thinking that will enable him/her to focus on the decisions to be made in the accomplishment of tasks (Costa: 1984, Stenberg: 1998).

Skills required for thinking critically in problem-solving and other life situations do not just appear in learners. The ability to engage in critical thought should be cultivated by the educator in the classroom environment. However, training learners to engage in critical thinking is not an easy task.

A number of researchers claim that the educator must create a classroom environment where modelling, rehearsal, and coaching opportunities give learners a chance to develop a capacity for informed judgements (Brown:1987, Heller: 1986).

In a study on coaching, Heller (1986) found that coaching leads to changes in learners' discussion, including critical analysis. Coaching involves helping learners in the accomplishment of tasks by redirecting or rechanneling their efforts and giving clues. Once assisted learners are able to move on independently.

It is also important for educators to appreciate the importance of developing critical

thinking skills in learners. This appreciation could lead to classroom environments where critical thinking is considered useful. Such educators are likely to develop materials necessary for promoting thinking and adopt the necessary techniques and activities that are likely to produce positive results.

Educators have a duty to create classroom environments that promote the expression of ideas.

2.6.4 **Assessment Techniques in the Classroom and Metacognition**

2.6.4.1 **Self-Assessment**

Learners can only develop the art of monitoring and controlling their thinking and learning activities if they are capable of self-evaluation. If learners are not given opportunities to look at their work, to think about it, to make evaluations verbally or written (and make the necessary adjustments) they will continuously rely on the educator to evaluate them. They will not develop an accurate assessment of their abilities. In the development of metacognitive skills, it is important for educators to develop the "STOP AND LOOK AT YOUR WORK!" habit in order for learners to develop critical skills of analysis.

On-going assessment, or continuous assessment plays a pivotal role in Outcomes Based Education. This kind of assessment plays a powerful developmental role since it places the emphasis on building and developing the learner.

Continuous assessment can take a variety of forms namely; peer-assessment, self-assessment, oral presentations, role play, written assignments, portfolio assessment, individual and group projects (Department of Education: 1998).

Self-assessment plays an important role in developing self-regulation and self-monitoring in learners. It encourages learners to assess their own performances against given criteria. From the given criteria they begin to recognise what is

expected of them, they are trained to identify their own strengths and weaknesses. Learners begin to identify areas of strength and areas in which they need support. It is therefore imperative for educators to include self-analysis, self-appraisal or self-assessment as an integral part of the teaching-learning process in order to develop independent learners who are capable of self-regulation.

2.6.4.2 The Value of Self-Assessment

Tudor (1996) suggests six main reasons for developing learners' self-assessment abilities.

a. **Promotion of learning**: Self-assessment is a tool for enabling learners to think critically about their competence. It can foster a more informed and intelligent attitude among learners.

b. **Raised level of awareness**: When educators train learners in self-assessment procedures, rather than expecting them to rely solely in the judgement of the educator and others, this generates in them a more independent and discerning attitude not only to assessment but course content and learning strategies.

c. **Improved goal-orientation**: Self-assessment leads learners to reflect on the variety of goals that are possible. They have an opportunity also to focus on the important goals of learning.

d. **Expansion of range of assessment**: Learner involvement in assessment can produce a richer and fuller profile of learning needs.

e. **Shared assessment burden**: Sharing the burden and responsibility for assessment between the educator and learners, rather than leaving it with the educator alone can lighten the load of the educator in both practical and psychological ways.

f. **Self-assessment fosters independent learning**: Training learners in self-assessment provides them with a skill crucial to subsequent learning, possibly in contexts where they will not have access to the evaluative advice of an educator. They learn to assess themselves. Self-assessment therefore fosters independent, self-directed learning.

2.6.4.3 Peer Evaluation and Peer Correction

Peer evaluation involves evaluating the work of peers in the classroom. Peer evaluation may also be seen as a form of self-assessment. The rationale for peer evaluation is that by reflecting critically on the abilities of other learners with respect to shared goals, learners are indirectly reflecting on ideas that are relevant to their own performance (Tudor: 1993, 1996, Makino: 1993).

Peer correction works on the principle of shared goals in collaborative learning groups. Edge identifies four advantages of peer correction:

* When a learner makes a mistake and another corrects it, both learners are involved in identifying and correcting an error.

* When an educator encourages learners to correct each other's mistakes, he or she receives a lot of important information about the learners' ability.

* Learners become used to the idea that they can learn from each other. Peer correction helps learners cooperate and helps make them less dependent on educators.

* If learners get used to the idea of peer correction without hurting each other's feelings, they will be able to help each other learn when they work in pairs or groups or any form of collaborative activity where the educator is not present (Edge: 1989).

2.6.5 TEACHING MODELS AND METACOGNITION

2.6.5.1 The Direct Instruction Model

The model is based in part on behavioural research about effective training procedures. It is most useful in teaching skills that can be broken into small, discrete segments, step-by-step procedures like summarisation skills.

It is important to note that direct instruction is a necessary but not a sufficient instructional tool because it is mainly teacher-centred.

> "Many steps in this model are useful . . . and to be without this effective tool is a disadvantage; to use it exclusively, however is deadening. . . . Used with other models in an instructional design, direct instruction provides a base for instructional practice" (Gunter, Estes and Schwab: 1995).

This quotation illustrates the need to use direct instruction with other teaching strategies for effective teaching to occur. A number of studies on effective teaching refer to direct instruction as an essential, vital strategy in teaching basic skills, facts and knowledge. It is particularly useful in introducing the new and the unfamiliar, especially in a situation where principles, steps or basic skills must be learnt before the learner proceeds to other levels of thinking. This is true of summarisation skills and some mathematical procedures.

2.6.5.1.1 Steps in the Direct Instruction Model

The following six steps constitute the direct instruction model:

i. Review previously learned material
ii. State outcomes for the lesson
iii. Present new material
iv. Guide practice with corrective feedback
v. Assign independent practice with corrective feedback

vi. Review periodically with corrective feedback if necessary (Gunter et al:1995).

Step i. Review previously learned material

Learners must clearly understand what they are expected to learn and the steps they will follow in that learning. They should be able to connect the new material to what has been learned already.

Step ii. State outcomes for the lesson

Outcomes should be presented to learners at the beginning of the lesson so that they are clearly focused on the abilities and competence they should demonstrate at the end of the lesson.

Step iii. Present new material

New material should be well structured or organized and presented in an interesting manner. Clear, detailed instruction and explanations must be given at each step. Frequent checks, through the use of questions should be used to determine if learners are following the given information. It is crucial to ensure that instructions and explanations are understood by the class.

Step iv. Guide practice with corrective feedback

The educator should guide learners through practice sessions. Practice is a crucial or essential part of direct instruction. This practice, whether guided or independent gives the learner the opportunity to develop his/her knowledge or skill. New material is presented in small steps, with ample opportunity for practice following each step. When an educator provides guided practice, he/she controls the process and monitors the practice of both the group and individuals in the group.

Step v. Assign independent practice with corrective feedback

Before giving independent practice, sufficient time must be spent on guided practice to ensure that learners are ready to work on their own. Independent practice requires careful coaching and monitoring of learners as they practise a new skill on their own. The educator moves around the class, checking whether all learners have mastered

the skill.

Step vi. Review periodically with corrective feedback if necessary

It is essential to build in a form of periodic review or checks to make sure that new learning has been retained. If the new material has been forgotten after a fortnight, it is essential to re-teach the same material.

2.6.5.1.2 **Effective Techniques in the Direct Instruction Model**

* **Practice**

Guided practice is provided by the educator. He or she leads learners through each step in a well organized or structured manner. It is an opportunity for learners to acquire skill or knowledge. Errors are corrected. When learners are able to demonstrate the expected competence levels, the educator gives them an opportunity to practise independently with periodic supervision until they are able to work independently.

* **Modelling**

Learners are able to acquire knowledge and skills by observing and imitating the educator. He or she acts as a model of the desirable behaviour. In certain instances, learners acquire steps in a skill, or information much more effectively by copying the behaviour of the educator.

* **The process towards goal achievement**

This strategy helps learners to focus on how tasks are accomplished. In other words, they appreciate the importance of step by step processes in achieving a goal.

2.6.5.2 Problem-based Instruction

Problem solving provides opportunities for developing metacognitive ability in learners. Metacognition (or the mental realisation of what we know and regulating how we go about learning) guides the problem-solving process and improves the efficiency of this goal-oriented behaviour. Metacognition helps the problem solver (1) recognize that there is a problem to be solved, (2) figure out what exactly the problem is, and (3) understand how to reach a solution (Davidson, Dueuser and Stenberg: 1994).

The essence of problem-based instruction consists of presenting learners with authentic, meaningful problem situations that can serve as springboards for inquiry. The instructional model has the following features:

- **Driving question or problem**: Problem-based learning organises instruction around questions and problems instead of content or academic principles. Such problems should be meaningful and should reflect authentic, real life situations.

- **Authentic investigation**: Learners should pursue authentic investigations that seek real solutions to real problems. Consider the following problem: (1) How can you make money in the stock market during an economic recession? Learners must analyse and define the problem, develop hypotheses and make predictions, collect and analyze information, make inferences and draw conclusions.

- **Collaboration**: Problem-based instruction is often characterised by learners working together in pairs or small groups. This collaboration provides motivation for sustained involvement in complex tasks and enhances opportunities for the development of thinking skills (Arends: 1997, Nelson and Narens: 1980, Nunan: 1992).

A good problem according to Arends (1997)must meet the following five criteria:

a. It should be authentic - related to real life experiences. For instance (1) How to curb the AIDS Epidemic in developing countries.

b. It should pose a sense of mystery. It should offer alternatives, not one that can be answered simply.

c. It should be meaningful to learners, relevant and appropriate to their intellectual level of development.

d. It should be sufficiently broad for the accomplishment of instructional goals and yet limited to specific time goals.

e. It must be one that can be tackled using group effort.

2.6.5.2.1 **Five Phases for Problem Based Learning (Arends: 1997)**

The following steps are useful procedures for problem-based lessons:

Effective Problem-Based Lessons

i. **Orient learners to the problem**

At the beginning of a problem-based lesson, the educator should clearly communicate the purpose of the lesson and to create high interest levels towards the problem/s. He or she should describe clearly what learners are expected to do. Learners should be clear that the purposes of a problem-based lesson are not to take in volumes of information but to develop thinking skills and to learn how to be independent learners. The presentation of the problem must be coherent and accurate. The use of videos or shocking pictures can captivate learners and spark a desire to solve problems.

ii. **Organise learners for study**

It is crucial to develop collaborative skills in learners as they tackle problems together. Learners can work in pairs or in groups. Such groups could be formed on mutual interests or friendship patterns.

iii. **Assist independent and group investigations**

Educators should assist learners to carry out investigative procedures like the following:

a. problem identification
b. hypothesizing
c. literature search (reading)
d. data collection methods
   observing, interviewing and so forth
e. data analysis / evaluation
f. conclusions
g. report

Educators should also assist learners to prepare videos, models and other artifacts to make the reports interesting.

iv. **Analyse and evaluate the problem-solving process**

Finally, it is important for the educator to give learners an opportunity to evaluate their work, to reflect on the processes and identify strengths and weaknesses (Arends: 1997).

In conclusion, there are four metacognitive processes that make problem-based instruction a valuable tool in instruction. These are (i) identifying and defining the problem, (ii) mentally representing the problem, (iii) planning how to proceed and (iv) evaluating what you know about your performance (Davidson et al: 1994).

2.6.5.3 **Scaffolding**

Scaffolding is the process where a more knowledgeable person (educator) helps a less knowledgeable person to master a problem beyond his/her current level of functioning. The learner is given hand-holding assistance to master a complex situation beyond his/her developmental capacity through the assistance (scaffolding) of an educator or a more accomplished person (Arends: 1997).

In the classroom, educators should challenge learners to go beyond their current thinking by using strategies that prompt learners to increase their capacities.

Language and communication play a key role in scaffolding. Dialogue between adults and learners plays a major role in helping youngsters to perform tasks independently. As children learn, adults change the nature of their dialogue so that they continue to support the child but also give the child increasing responsibility for the task. They ask the child to carry on and finish the task or the story. The scaffolding principle takes place in the child's zone of proximal development (Vygotsky: 1978). This is a range or level in which a child can perform a task with help. The idea is to stretch the child's mind, but stay within his/her capability of understanding.

It is therefore important for educators to refrain from continuously giving learners ideas and theories about the world, but to use discovery and problem-based learning, to pose questions and allow learners to arrive at their own understanding.

Educators can use the scaffolding principle if they pay attention to the following principles:

i. Assume the learner is competent
ii. Know the learner
iii. Share an interest in the task at hand with the learner
iv. Follow the learner's lead

v. Capitalize on uncertainty

(North Central Regional Education Laboratory: 1995)

2.6.5.4 **Reciprocal Teaching**

In reciprocal teaching, the educator and learners take turns in leading dialogues about texts. Learners are taught specific comprehension strategies namely, summarising, asking questions, clarifying and predicting. The educators acts as a mediator, coach or facilitator. The educator promotes self-regulated learning by gradually shifting the responsibility for teaching to learners and ever remaining present in the group to help them monitor their own thinking and the use of strategies (Stevenson and Palmer: 1994).

Reciprocal teaching focuses on learning by doing. It allows learners to accept responsibility for classroom events. This reduces the educator's degree of control by allowing a change of role. In reciprocal teaching there is more emphasis on learning by doing than direct instruction. Learners are taught to discover and evaluate their beliefs.

The four strategies used in reciprocal teaching - summarising, clarifying, asking questions and predicting are activities that experienced learners engage in while studying. Such strategies teach learners what they need to do in order to understand and learn from a text. The strategies are modelled by the educators and then observed and practised by learners.

The role of the educator is important in a number of ways. He or she provides a model of expert behaviour which learners can copy. Secondly, he or she has a clear instructional goal of keeping the discussion focused and ensuring that a reasonable level of understanding is reached. Thirdly, he or she provides feedback that is adjusted to the learners' level of understanding, encouraging them to progress gradually towards full competence (Stevenson and Palmer: 1994).

2.6.5.5 "New" Thinking on Teaching and Learning: Collaboration

The "new" vision of learning suggests the development or creation of successful learners. Successful learners have the following characteristics:they are knowledgeable, self-directed, self-determined, goal-directed and autonomous. Effective communication and collaboration are essential to becoming a successful learner. It is primarily through dialogue and examining different perspectives that students become knowledgeable, strategic and self-determined. Engaging learners in real world tasks, problem-solving and dialogue requires effective communication and collaboration between educators, learners and other learners. Collaborative learning affords learners enormous advantages not available in traditional instruction because a group can accomplish meaningful learning and solve problems better than any individual alone (North Central Regional Education Laboratory: 1995).

2.6.5.5.1 Characteristics of A Collaborative Classroom

Educators have to change their mindset on teaching and learning and make a conscious effort to create collaborative classrooms. Tinzmann (1990) states that such classrooms have the following characteristics:

2.6.5.5.1.1 Shared knowledge among educators and students

In traditional classrooms, the teacher is the information giver. Information and knowledge flow only one way from the teacher to learners. The mark of collaborative classrooms is shared knowledge. The educator has vital knowledge, skills and information on the subject, content and instruction and he or she still provides information to learners. But this is not done in a one-way manner. Collaborative educators value and build upon the knowledge, personal experiences and language of the learners.

When educators make use of what the learners know and build on that knowledge, learners recognise that their experience and knowledge are valued. They are

motivated to listen and learn in new ways. They also become empowered.

2.6.5.5.1.2 **Shared authority among educators and learners**

In collaborative classrooms, educators share authority with learners in a number of ways. In most traditional classrooms, the educator is solely responsible for selecting outcomes or setting goals, designing learning tasks and assessing what is learned. Collaborative educators plan and set goals, but they invite learners, from time to time, to set goals within the framework of what is taught. They invite learner opinion on activities. Collaborative educators encourage learners to share their knowledge or discover new knowledge and share it with others.

2.6.5.5.1.3 **Educator roles in collaborative classrooms**

* **Mediator of Learning**

When knowledge and authority are shared among educators and learners, the educator's role increasingly becomes that of a mediator. He/she helps learners to figure out what to do when they have problems in their learning tasks and they cannot proceed. He/she helps them to connect new information to their experiences. He/she gives optimum support to help learners take responsibility for their own learning. Mediation includes facilitating, modelling and coaching.

* **Facilitating**

This involves creating rich learning environments and activities for linking new information to what is known and providing opportunities for collaborative work and problem-solving. This includes giving learners a variety of authentic learning tasks. It also involves facilitating high quality group interaction, working in pairs and other forms of collaborative activity.

* **Modelling**

Modelling means sharing one's thinking and demonstrating or explaining something. It means sharing your thoughts with your learners, thoughts on what is learnt, or the interaction that is taking place. It may involve thinking aloud, verbalising thinking processes or demonstrating - showing learners how to do something in a step-by-step manner.

* **Coaching**

Coaching involves giving hints or cues, providing feedback and redirecting learner's efforts. It means providing help when it is required.

2.6.5.5.1.4 Instructional Models and Interaction in Collaborative Classrooms

The most powerful models of instruction are interactive (Jones, Valdez, Nowakowski and Rasmussen: 1994). Learners interact generatively with the educator and they teach other learners interactively. Learning is sometimes problem-based, project-based or goal-based. Common strategies for instruction include problem-solving, discovery learning, cooperative learning and reciprocal teaching. Direct instruction, when used should be interfaced with groupwork or another learner-centred grouping. Collaborative class designs and grouping are promoted. Opportunities for individual work are also given as in self-assessment or planning.

2.6.5.5.1.5 Assessment in Collaborative Classrooms

While educators have the primary responsibility of assessing learners, collaborative classrooms view assessment in a much broader perspective. One goal in education is to develop learners who are capable of evaluating their own performance, learners who are self-directed and self--regulated. Self-assessment, and peer assessment therefore should be included as forms that extend the responsibility from the educator to learners. Collaboration and cooperation is shared responsibility between the

educator for everything that takes place in the classroom, including assessment. Teacher assessment should be used together with other forms of assessment like self-assessment and peer evaluation (Jones et al: 1994).

2.7 MEANINGFUL AND ENGAGED LEARNING FOSTERS METACOGNITION

Educators need to maintain an orientation of instruction that is in keeping with modern trends in instructional reform. In recent years, researchers have outlined the importance of engaged learning in schools. When educators create a metacognitive environment in the classroom and the school, engaged learning occurs. Metacognition and engaged learning have developed because of the recognition of the changing needs of the 21st century. Jones and his co-authors developed indicators of engaged learning described below. The following indicators specify an orientation of teaching that should help learners to develop into self-regulated individuals (Jones et al: 1994).

2.7.1 Indicator One: The Vision of Engaged Learning

Engaged learners are successful, independent learners who are responsible for their own learning. Such learners are self-regulated, they are able to define their own learning goals and evaluate their own achievement. They are energized by their learning, their joy of learning leads to a lifelong passion for solving problems, understanding and taking the next step in their thinking. Engaged learners are strategic - they know how to learn, to transfer knowledge and to solve problems creatively.

2.7.2 Indicator Two: Tasks for Engaged Learning

Engaged learning demands that educators need to prepare learning tasks that are challenging, authentic and multidisciplinary. This calls for lengthy preparations.

2.7.3 Indicator Three: Assessment

Assessment of engaged learning involves giving learners an authentic task, project or problem, and then observing, interviewing and examining presentations to assess what they actually know and can do. This performance based assessment involves learners in the evaluation of their performance.

2.7.4 Indicator Four: Teaching Strategies for Engaged Learning

The powerful tools of instruction in engaged learning are interactive. Learners interact with the educator and teach others interactively. This allows for co-construction of knowledge. Useful activities can be individual or group summarizing, brainstorming, dialogue, problem-solving and team-teaching.

2.7.5 Indicator Five: Learning Context of Engaged Learning

The classroom must be conceived of as a knowledge-building learning community. Learners learn from others and from the educator. This learning community develops shared understanding. It values diversity. There is a constant search for strategies to empower members. Such collaborative classrooms encourage learners to define problems, lead conversations, set goals and engage in entrepreneurial activities.

2.7.6 Indicator Six: Grouping for Engaged Learning

Learning is characterised by constant collaborative work that is learner-centred. Such learning would involve small groups or teams. Flexible groups, involving different sexes, cultures, abilities can offer a wealth of knowledge and different perspectives on tasks.

2.7.7 Indicator Seven: Educator Roles for Engaged Learning

The role of the educator has shifted from the primary role of information giver to that

of facilitator, guide, resource-person and learner. The educator, as a facilitator, provides the rich learning environment that is suitable for collaborative study. The educator is a co-learner, co-investigator with learners, but also includes mediation, modelling and coaching in his teaching role.

2.7.8 **Indicator Eight: Learner Roles for Engaged Learning**

The learner is an explorer, an investigator. He/she interacts with the physical world and other people to discover and apply knowledge. Learners should be encouraged to reflect, talk about their discoveries. They must be given opportunities to apply their processes. They integrate what they have learnt with what the educator provides. They become producers of knowledge instead of continuously receiving knowledge.

2.8 THE SCHOOL LIBRARY AND RESEARCH

A metacognitive environment encourages learners to develop enquiry skills. Activities that help learners to plan, set goals and monitor problem-solving processes should be encouraged in the school environment. Research activities in all subjects provide opportunities for developing metacognition in learners (Blakey and Spence: 1990).

Research activities cannot take place in a learning environment that is lacking in resource materials that are so essential in stimulating thinking processes in learners. A school library is an essential requirement in the development of metacognition in learners. Extra reading material, supplementary readers must be readily available to supplement information provided in prescribed books. Access to a wealth of resources can foster the development of learners who are good thinkers and problem-solvers.

2.9 REFLECTIVE EDUCATORS AND METACOGNITION

Learners who possess metacognitive skills are able to plan, monitor and evaluate learning activities. Such learners are active thinkers who are independent in working

out solutions. Metacognitive ability goes beyond recitation or memorisation of material provided by the educator. Educators cannot tell or advise learners to acquire metacognitive skills. They will be called upon to activate and stimulate learners to be active thinkers who are capable of self-regulation. This requires skill and expertise on the part of the educator.

2.9.1 **Reflective Educators Possess Metacognitive Ability**

If educators are to train learners in metacognition, they must reflect metacognition ability. In other words, metacognition strategies must predominate the practice of all educators in order for learners to be trained effectively in managing their own learning.

> Teachers will be considerably aided in the task of teaching children to be aware of their learning strategies and to use them appropriately if they too reflect on their own learning strategies and assess their success in different situations. Such reflection will increase teacher's metacognitive understanding of their own practices, and so enable them to show the children what they are and how to use them (Stevenson and Palmer: 1994:188).

The kind of educator who has metacognitive ability is the reflective educator. Reflective educators are broad-minded, versatile practitioners who possess those qualities that enable them to rise above chalk and talk methods and employ a variety of teaching strategies that are well-thought out and well-developed. In the practice of such educators, teacher dominance and teacher talk are replaced by collaborative activity between the educator, the learner and other learners.

2.9.2 **Reflective Educators Employ a Variety of Teaching Strategies**

The purpose of reflective teaching is to bring about reflective learning. The process of reflective learning results in metacognition. Learners engage in planning self-evaluation and self-understanding. Reflective educators possess adequate skills in learner-centred methods of teaching. Learner-centred approaches like Reciprocal

teaching, Project Work. Discovery Methods bring out inquisitiveness, critical ability and creativity in learners. These approaches play a vital role in developing independent, self-regulated learners (Handall: 1987, Hull: 1989, Richard: 1994, Richard and Lockhart: 1994, Wong and Jones: 1982, Wong: 1991,).

Apart from learner-centred strategies, research has shown that explicit direct instruction is valuable in helping learners to master learning strategies. Educators need to teach important learning strategies explicitly to their learners and to help learners become effective in their use (Arends: 1997, Heller: 1986).

2.9.3 **Reflective Educators Create Rich Learning Environments**

A rich learning environment promotes independent learning. Creative work displays and stimulating bulletin boards, spark curiosity and serve as motivators for independent inquiry. The physical environment clearly highlights the importance educators attach to independent learning. Effective educators display the results of student's work and also encourage learners to display their own work when they think they have done a good job.

> The physical environment highlights the importance teachers attach to self-regulated learning. So too do the teacher's words and deeds (Arends: 1997: 268).

2.9.4 **Reflective Educators Engage in Self-evaluation and Self-enquiry**

Reflective educators engage in self-evaluation and self-enquiry. In other words, they are self-questioning experts. This kind of practitioner evaluates every stage of the teaching-learning situation. He/she considers all the activities, successes and failures, of the learning episode. He/she is actively engaged in thinking and working out ways of responding to problem situations and all situations surrounding the teaching-learning situation (Collins: 1994, Cruishank: 1981, 1985, Pollard and Tann: 1987, Porter and Brophy: 1988).

The process of self-evaluation affords the educator to reflect on his/her strengths and weaknesses. If this assessment is done objectively it can pave the way for professional growth and development.

> Reflective action involves a willingness to engage in constant self-appraisal and development (Pollard and Tann: 1987:4).

The reflective educator should impart the constant self-appraisal and self-interrogation to learners by modelling self-questioning techniques to learners. Learners must be shown the importance of asking themselves questions inwardly and verbally in order to evaluate and monitor learning processes.

2.10 **SUMMARY**

The major challenge in the effort to develop metacognition in learners rests in the educator's ability to establish a rich learning culture in the classroom. Apart from the competence to execute a wide variety of teaching strategies, educators must be able to facilitate collaborative learning and also engage learners in activities that promote critical thinking.

This study investigated the effectiveness of selected metacognitive teaching strategies on the summarisation skills of second language speakers of English in secondary schools of the North West Province. The study also assessed the extent to which educators in the selected schools of the North West Province use teaching strategies that are likely to facilitate the development of metacognition in learners. The next chapter outlines the experimental and non-experimental research methodology employed in the study towards the achievement of research goals.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter provides a description of the research design of this investigation as well as a discussion of data collection, techniques and measurement tools used. Issues related to quality and relevance of research results, the reliability and validity of the measurement process are also discussed.

The primary goal of any research is to obtain the most accurate and valid information that provides convincing evidence on the research problem under investigation. The researcher needs to draw accurate conclusions that are based on reliable information. The selection of suitable methodology becomes crucial. In scientific studies, researchers normally set up experiments to test relationships between variables. The first major concern in such a study is the issue of internal validity. Internal validity refers to the extent to which the researcher accurately describes the relationship between the variables of interest. The second major concern deals with the question of external validity or the applicability of the findings to other settings and situations and it is a factor that determines the relevance of the study (Bailey: 1982). Considerations undertaken to ensure both internal and external validity in this investigation are discussed later in this chapter.

Two types of research methodology were used in this investigation. One of them is the experimental method. The experimental method is considered valuable in testing the effect of one variable on another variable, particularly where experimental conditions are set up to control other variables that are likely to interfere with the accuracy of results (Eichelberger: 1989). This method was employed to test the effectiveness of selected teaching strategies in facilitating the development of metacognition in learners. Although the inherent strength of the experimental method in investigating cause and effect relationships cannot be questioned, problems

associated with controlling other variables should not be underestimated. The experimental method and its merits and limitations are presented in this chapter.

The other type of methodology used in the study is non-experimental methodology. Non-experimental research methodology in the form of questionnaires and interviews is useful where respondents have to provide information about themselves (Hitchcock and Hughes: 1989). This method was selected to assess the beliefs and philosophies of educators in order to establish whether their teaching techniques are likely to facilitate the development of metacognition in learners. Lesson observations also constituted part of the non-experimental research and the main objective of these observations was to check the results obtained in the interviews and questionnaires. Full details of the non-experimental research are discussed in the following sections of this chapter.

3.2 TYPES OF RESEARCH METHODOLOGY USED IN THE RESEARCH

A research design lays a plan of action and strategies used to obtain answers to the research question (Bailey: 1982). This plan includes the selection of research participants, the area under investigation and the methods used to collect and analyse data (Borg and Gall: 1989, Bowen and Weinsberg: 1977, Johnson and Wichern: 1998).

The study employed the use of both experimental and non-experimental research methodology. The experimental research methodology involved three hundred and twenty learners from four secondary schools (see Table 2). Three hundred educators provided responses to questionnaires and twenty educators took part in the interviews and lesson observations in the non-experimental part of the research (see 3.3.2). The experimental research methodology was employed to test the effectiveness of selected teaching strategies in facilitating the development of metacognition in learners. The experimental research strategy involved the use of an experiment which involved eight classes in four secondary schools. This experiment followed procedures used in scientific research to test the effect of a selected variable on

another variable. Such procedures are used to investigate cause - and - effect relationships. Non-experimental research methodology in the form of questionnaires, interviews and lesson observations was used to assess the extent to which educators are likely to develop metacognitive ability in learners.

3.3 **Population and Sample**

The participants in this study were drawn from secondary schools in three districts of the North West Province. The three districts selected are Mafikeng, Litchtenburg and Zeerust districts in the North West Province of the Republic of South Africa (see Appendix G). Thirty schools out of a total population of fifty secondary schools were selected from 10 circuits in the North West Province. Participants were taken from the thirty secondary schools in the following school circuits: Itsoseng, Botshabelo, Lichtenburg, Mmabatho, Montshioa, Stadt, Bodibe, Dithakong, Dinokana and Motswedi.

There are a number of school categories in the North West Province. Only one category, namely secondary schools, was chosen because the nature of the study required a certain level of cognitive ability. Secondly, the study used data collection methods that were quite demanding in terms of time and human resources; namely lesson observations, strategy training of classes and tests, interviews and questionnaires.

The selected schools represent the typical secondary school in the North West Province, in terms of size and character. These schools are found in three different types of environments that are part of the setting in the province namely rural, peri-urban and urban settings.

A number of considerations were borne in mind in working out the size of the sample. In research, the size and representativeness of the sample are two major factors that have to be considered for validity and reliability. The sample must be large enough to draw a reliable generalization on the population from which it is taken. If the size

of the sample is large, it provides a better estimate for generalising results. However, the unique circumstances of each study, the resources available and the measurement tools, ultimately determine the number of participants that can be used.

3.3.1 **Sampling**

Sampling refers to the process of selecting a number of individuals for a study in such a way that the individuals represent the larger group from which they were selected. The individuals selected are the sample and the larger group is the population. Sample size and representativeness of the sample are crucial factors in research (Tuckman: 1994).

3.3.1.1 **Simple Random Sampling**

Simple random sampling is the process of selecting a sample in such a way that all individuals in the defined population have an equal and independent chance of being selected and the selection of one individual does not affect the selection of another individual.

Random sampling is the best way to obtain a representative sample (Charles: 1988, Tuckman: 1994). This method of sampling was used for the experimental investigation and the non-experimental research methods in the study.

Useful Steps in Random Sampling

i. Identify and define the population. The researcher identifies and defines the group to which he or she would like the results of the study to be generalised.

ii. Determine the desired sample size.

iii. Obtain a list of the population.

iv. Determine what X is equal to by dividing the size of the population by the

desired sample size.

v. Start at some random place at the top of the population list and take every X^{th} name on the list until the desired number is reached (i.e. sample size is obtained).

vi. If you reach the end of the list before the sample size is obtained, you begin the process at the top of the list (Tuckman: 1994).

This procedure was used to draw up the sample for this research.

Six hundred and forty participants took part in this study. Three hundred educators were randomly selected to take part in the study. Three hundred and twenty learners constituted the experimental and control groups used to test the effect of metacognitive training strategies on summarisation skills. Twenty respondents (educators) were randomly selected from twenty schools to take part in lesson observations and interviews.

Table 1 indicates the choice of schools and respondents used in the sample.

Table 2 indicates the schools and learners used in the experimental research procedures.

TABLE 1: CHOICE OF SCHOOLS AND RESPONDENTS: QUESTIONNAIRE

CIRCUIT	SCHOOL	EDUCATORS
1	1	10
	2	10
	3	10
2	4	10
	5	10
	6	10
3	7	10
	8	10
	9	10
4	10	10
	11	10
	12	10
5	13	10
	14	10
	15	10
6	16	10
	17	10
	18	10
7	19	10
	20	10
	21	10
8	22	10
	23	10
	24	10
9	25	10
	26	10
	27	10
10	28	10
	29	10
	30	10

(N = 300)

TOTAL: 300 Educators

TABLE 2 CHOICE OF SCHOOLS AND RESPONDENTS: Experimentation (Learners)

Circuit	School	No of Learners
1.	1	80
2.	2	80
3.	3	80
4.	4	80

TOTAL: 320

3.4 DATA COLLECTION TECHNIQUES

Issues surrounding the quality and relevance of results are of utmost importance in research. The degree to which conclusions are based on valid and reliable data is the most important element of the quality of a study (Eichelberger: 1989). The researcher therefore needs to employ data collection methods that are reliable and valid, those that would lead to an efficient investigation where quality and relevance cannot be questioned.

3.4.1 Quality of Data: Reliability and Validity

Data quality addresses issues of validity and reliability. Reliability refers to the consistency of the results of a test. If the test were to be repeated it should give similar results for the same individuals.

Validity addresses the extent to which a measurement process measures what one wants to measure. The validity of measurement firstly ascertains that the measuring instrument is actually measuring the concept in question and secondly, that the concept is being measured accurately. (Eichelberger: 1989, Kirk and Miller: 1986)

In this study, four methods were used for data collection. These methods are

experimentation, questionnaires, interviews and observation. The use of several methods was done to enhance reliability and validity. The first method was an experiment on the effect of metacognitive training on summarisation skills. Two classes (Grade 12) of mixed ability learners were used in four schools. Eight classes in all took part in the experiment. One class in each instance became the experimental group and the other class the control group. The experimental group was exposed to metacognitive training strategies using summarisation passages for one hour per day for five days (see Appendix D and E). Pretesting and post-testing were done to the two groups in each school. Secondly, questionnaires were given to educators (see Appendix A). Lesson observations and interviews were used to check the results obtained in the questionnaires (see Appendix B and C).

The use of several methods was meant to achieve the effect of triangulation, thereby increasing the validity of data.

> Triangulation refers to the use of more than one method of data collection within a single study...Triangulation encourages flexibility and can, as in the case of the analysis of interview and conversational materials, add some depth to the analysis and potentially increase the validity of data (Hitchcock and Hughes: 1989:104).

3.5 EXPERIMENTAL RESEARCH

3.5.1 Experimental Research Sample

Four schools were randomly selected from the total sample of thirty schools used in this research (see Table 2). Three hundred and twenty learners from a total population of three thousand and four hundred learners in the four schools participated in the experiment. The main goal of the experiment was to test the effectiveness of selected teaching techniques in promoting the development of metacognition in learners.

3.5.2 **The Main Elements in Experimental Research**

A true experiment in scientific research is a procedure for investigating cause-and-effect relationships by randomly assigning subjects to groups in which one or more independent variables are manipulated. The main element in experimental research is that the investigator deliberately sets up conditions in which different groups of subjects have different experiences as indicated in the following design:

The Pretest-Posttest Control Group Design is represented below:

Experimental Group	Control Group
1. T_1 - Pretest	1. T_1 - Pretest
2. Treatment X	2. T_2 - Posttest
3. T_2 - Posttest	

The first step in this kind of design is to randomly assign subjects to the experimental group and the control group (Schumacher and Macmillan: 1993). In this study four schools were randomly selected from the population (see Table 2). Two Grade 12 (mixed ability classes) were randomly selected to represent the experimental group and the control group in each school from a number of Grade 12 classes. Two classes were drawn from each school and three types of schools, namely rural, urban and peri-urban schools were used.

The second step in an experiment is to pretest each group on the dependent variable. In this particular investigation each group was given a test on summarisation skills. The third step is to administer the treatment condition to the experimental group but not to the control group, keeping all other conditions the same for both groups. In this study, the experimental group received one hour training sessions (for five days) in metacognitive skills as they relate to summarisation in English. The control group received unguided instruction on summarisation rules. Both groups were finally posttested on the dependent variable - (summarisation skills).

There are certain important considerations to be made in experimental research. The first important characteristic is that it must achieve statistical equivalence of subjects (Charles: 1988, Tuckman: 1994). In other words, the groups compared must be equivalent so that any differences in their performance must not be attributed to the differences in the groups. Random assignment is one way of achieving statistical equivalence. In this study, there was an attempt to randomly select schools and mixed-ability Grade 12 classes to achieve statistical equivalence.

Experiments are research studies designed for establishing casual relationships (Ary: 1990). In other words, experiments are carried out to investigate cause and effect relationships e.g.

The effect of drugs on reading speed

Cause (Drugs) → Effect (Reading Speed)

Experiments may be conducted to establish whether there is a relationship between drugs and reading speed. When the researcher constructs a hypothesis, he/she takes the initial step in predicting a relationship or connection between variables. When the hypothesis has been formulated, the researcher must work out situations that may be observed to test the relationship. The hypothesis states expectations on the relationship between variables but the experiment is the event that is planned and carried out by the researcher to gather evidence relevant to the hypothesis (Ary: 1990, Cohen and Manion: 1980).

The researcher selects a research design or plan for carrying out the test. It is very important that an appropriate testing method be chosen. Appropriate tests, scales, and other tools are required to measure the variables and the reliability and validity of these operations must be clear. The aim is to choose measures that are objective and reliable.

In conducting the experiment, the researcher takes great care in manipulating and controlling variables in the test and also in observing and measuring results. It is

important to measure what was intended to be measured without the interference of other factors/variables (these are called unwanted or extraneous variables). Manipulation and control are key factors in experimental designs.

3.5.3 **Manipulation and Control**

The hypothesis contains

- an independent variable

- a dependent variable

e.g.

(Metacognitive teaching strategies) lead to (good summarisation skills)

(X)	(Y)
independent variable	dependent variable

(X) Independent variable - the treatment or cause (metacognitive teaching strategies).

(Y) Dependent variable - effect (good summarisation skills).

To test this hypothesis the researcher manipulates the independent variable. He/she might choose to manipulate the amount of treatment subjects receive. In manipulating the variable, the researcher might choose to change amounts, vary the independent variable, or remove it altogether (Tuckman: 1994).

At the same time, he/she must control all other unwanted variables that might affect the dependent variable.

A researcher may hypothesize that children will learn to spell better if spaced practice is used rather than massed practice.

(X) Independent variable - spacing of practice

(Y) Dependent variable - spelling mastery

The researcher manipulates the independent variable - practice - the spacing of practice. All conditions must be kept the same for two groups of children except that spelling practice must be one long session for one group and short sessions daily for the other group. In other words, all conditions are held constant while the researcher manipulates the independent variable (Wiersma: 1991).

In this study the researcher manipulated metacognitive teaching strategies. The researcher wanted to discover if students achieve higher scores in summarisation if metacognitive training strategies are used. The independent variable in this case was the use of metacognitive training strategies. The dependent variable was summarisation skills. All conditions were kept constant while the researcher manipulated the use of metacognitive training strategies on the subjects.

Experimental research is not easy. The researcher does not merely manipulate one variable to see what happens to the other variable. Experiments require controlled observation. The researcher must control other unwanted variables (extraneous variables) (Tuckman: 1994).

3.5.4 **Internal Validity**

When an investigator engages in research, selecting an appropriate experimental design is very important. If the design is valid, it gives truthful results. There are instances where researchers measure distorted information. Internal validity is concerned with such questions as;

- Did the experimental treatment (independent variable) really bring about a change in the dependent variable?

- Did I measure accurately what I set out to measure?

Internal validity is a problem of control. If the researcher does not control for extraneous variables - other variables might have led to the effect, i.e. dependent

variable (Y) not the independent variable (X). Ary (1990) cited 8 (eight) extraneous variables that normally interfere with research results. Researchers must therefore be certain that the following have not produced an effect that can be mistaken for the independent variables.

i. Contemporary History - specific events, other than the experimental treatment may occur between the first and second measurements to produce changes in the dependent variable.

ii. Maturation - Processes that operate within the subjects simply as a function of the passage of time may produce effects that could be mistaken for the dependent variable.

e.g. subject might be tired, or less motivated than they were during the first measurement.

iii. Pretesting - Exposure to the pretest may affect the subjects performance on a second test regardless of the experimental treatment X.

iv. Measuring Instruments - Changes in the measuring instruments, the scores, or the observers may produce changes in the obtained measurements.

v. Statistical Regression - If groups are selected on the basis of extreme scores, statistical regression may operate to produce an effect that could be interpreted as due to X - the experimental treatment. The regression refers to the tendency of extreme scores to regress or move towards the common mean on subsequent measures, (second test). The more extreme the subjects score are from the mean, the more they are likely to vary. Random instability in the population may also cause regression towards the mean.

vi. Differential Selection of Subjects - Sometimes there are important differences between the two groups, the experimental group and the control group even before the application of the experimental treatment e.g. Group A might be more intelligent than Group B and will therefore perform better on a spelling test with or without X - the experimental treatment.

vii. Experimental Mortality - Sometimes subjects drop out of the group during the experiment. This normally affects the outcome of the study.

viii. Selection - Maturation Interaction - This problem may occur in a situation where the experimental and control groups are not randomly selected but instead are pretesting groups, for instance, classroom. Although the two groups may have the same scores for the pretest, other differences, likely motivation may lead to different scores in the posttest and not necessarily the independent variable.

In this study, the researcher tried to control a number of extraneous variables. Firstly, the pretest and posttest were given within five days to control against the effects of history and maturation. Qualitatively, the measuring instruments were of the same standard for both the pretest and posttest. The differential selection of subjects was controlled by using mixed ability classes. Special care was taken to control for experimental mortality - subjects did not drop out of the group during the experiment.

Attempts were made to control all extraneous variables that could have affected the internal validity of the data.

3.5.5 **External Validity**

External validity answers the following questions: To what populations and settings can these findings be generalised? How representative was the study? Any valid study must represent the qualities of the larger population to which results are to be generalised (Tuckman: 1994).

When examining the external validity of a design, the researcher must check factors that are a threat to representativeness. Ary (1990) sets out the following factors:

i. Interaction effects of selection biases and X.

The qualities or characteristics of the subjects who are selected to take part in the experiment determine to what extent the findings can be generalised. For instance - a few students taken from one school cannot represent the whole country.

ii. Reactive or Interaction effect of Pretesting

The pre-test may limit the generalizability of the findings. The subjects become alert to a number of issues and in a sense are now different from the population they were supposed to represent.

iii. Reactive Effects of Experimental Procedures

The presence of observers, or the researcher may alter the normal behaviour of the subject. What the researcher might measure might not be a result of X but a combination of factors.

iv. Multi-treatment interference

When subjects are exposed to more than one experimental treatment X, the effects of X_1 and X_2 etc. accumulate. Therefore the findings may be generalised only to subjects who experience the same sequence of treatments repeatedly and not the whole population.

In this study the researcher checked the above factors that pose a great threat to the external validity of the study. The researcher exposed the subjects to one experimental treatment to avoid multi-treatment interference. The nature of the test was not affected by the presence of the researcher, therefore reactive effects of experimental procedures were controlled. A representative sample, was drawn from each school to control for the interaction effects of selection biases.

3.5.6 **Various Experimental Designs**

There are several experimental designs that a researcher can choose from. The following are some of the designs in experimental research.

3.5.6.1 **A "POOR" DESIGN**

1. **One Group Design** - No Control
   No Pretest

TEST: To determine whether phonics methods will improve spelling mastery.

Procedure

Two steps

(X) i. Expose subjects to phonics methods for a given period of time (Treatment).

ii. Administer the post test - give a spelling test after the treatment (X) T_2

Advantage: This design is only useful in action research

Disadvantages

i. No control - no internal validity
ii. No pretest - no comparison

This design was not chosen for this study because of its weaknesses. It does not guarantee the validity of a test (Schumacher and Macmillan: 1993).

3.5.6.2 ONE-GROUP PRETEST - POSTTEST DESIGN

Test: To determine whether the phonic method improves spelling mastery.

Procedure

i. Pretest - Administer the first test - (T_1) measure spelling mastery

ii. Treatment - Expose subjects to phonic (X)
method of teaching spelling for a given period of time

iii. Posttest - Administer the second test - (T_2) measure spelling mastery

after exposure to X. Compare T_1 and T_2 to work out what difference X - the treatment has made.

1.	Pretest T_1
2.	Treatment X
3.	Posttest T_2
	Compare T_1 and T_2

Advantages:

There is a comparison before and after the treatment X. It is also an advantage that the same subjects take the pretest and posttest, because this controls selection and mortality problems.

Disadvantages:

The researcher cannot be thoroughly certain that it is only X who led to Y and not other factors like history, maturation, pretesting and so on.

Extraneous variables - due to history, maturation or testing effects might interfere between T_1 and T_2

This design was also not chosen because it does not control extraneous variables (Schumacher and Macmillan: 1993).

3.5.6.3 **Randomized Control - Group Pretest - Posttest Design**

For any cause and effect test

Procedure

i. Subjects are selected from the population using random methods.

ii. Subjects are divided into two groups - by random methods - the experimental group and control group.

iii. Pre-test both groups on the dependent variable (summarisation skills). Find the mean pretest scores for both experimental and control groups.

iv. Keep all conditions the same for groups, except for exposing the experimental group to the treatment X. (independent variable) for a period of time.

v. Administer the Posttest T_2 on the dependent variable (summarisation skills) after treatment and find the mean posttest score for both groups.

vi. Find the difference between T_1 and T_2.

vii. Compare the differences to determine if X led to changes in Y.

viii. Apply an appropriate statistical test to determine whether the difference in the scores is significant (Schumacher and Macmillan: 1993).

Experimental Group	**Control Group**
1. T_1 (Pretest)	1. T_1 (Pretest)
2. Treatment X	2. T_2 (Posttest)
3. T_2 (Posttest)	

Advantages:

Internal validity is assured in the randomized control - group pretest - posttest design. Extraneous variables that occur between T_1 and T_2 are controlled - between sessions.

Disadvantages:

Within - sessions differences may occur between the experimental and control groups

(Schumacher and Macmillan: 1993).

This design was selected for this study because it guarantees both internal and external validity.

3.5.7 **Aims of the Metacognitive Training Strategy in Summarisation Skills**

The general aim of the metacognitive training strategy was to train the experimental groups in selected metacognitive learning skills in order to bring about self-directed, self-regulated approaches to developing summarisation skills. The metacognitive training programme was specifically designed by the researcher to develop the following skills in experimental groups:

i. To train learners to monitor and regulate their progress in writing a summary.

ii. To offer limited practice in strategies that would help learners to use summarisation rules independently for example selection of key ideas, deleting trivia, using superordinate terms.

iii. To train learners to effectively use metacognitive skills like planning, self questioning, self-evaluation in carrying out a learning task like summarisation.

iv. To train learners to assess a learning task and select the most appropriate strategy for its completion.

v. To equip learners with metacognitive skills that would enable them to write a summary of a passage within the given examination time (20 minutes).

3.5.8 **Experimental Procedures**

The experimental groups in the study received one hour teaching sessions on summarisation using selected metacognitive strategies for five days. The following

section outlines the specific procedures used in the study:

3.5.8.1 **The Teaching of Summarisation Skills to English Second Language Higher Grade Learners using Metacognitive Strategies (A Programme Designed by the Researcher)**

3.5.8.1.1 **First Phase**: Explicit Direct Instruction by the educator on summarisation.

Useful Questions

a. What is a summary?

b. What procedures are involved in summarisation?

[Learners are asked to think about and list strategies they would use to come up with a short version of a story]

c. Summary questions

d. Meaningful reading and comprehension of the passage to be summarised (see Appendix D)
[Opportunities for (1). loud reading and (2) silent reading (for comprehension)]

3.5.8.1.2 **Second Phase**: Metacognitive Training
Training on how to monitor and control rules on summarisation

3.5.8.1.3 Training on self-questioning in the accomplishment of tasks e.g. selection of key ideas.

3.5.8.1.4 Modelling of self-questioning by educator.

3.5.8.1.5 Collaborative activities

- Pairs - comparing key ideas selected
- Groups - deletion of trivia or redundant material
- Whole class activity - Educator plus learners : Key ideas are noted on the chalkboard

3.5.8.1.6 Coaching/Mediation (Individual tasks)

- Helping learners to assess on-going performance. Training on self-monitoring and self-regulation. Each learner works on his or her own summary.

- Reducing the number of words if necessary

- Substituting superordinate terms with one term

- Checking completeness of sentences of the format - to point form

- Writing the number of words used in brackets at the end of the summary.

3.5.8.1.7 **Third Phase**

(Writing the final draft of the summary).

Each learner writes the final draft of the summary.

3.5.8.1.8 **Fourth Phase**

Self-evaluation

Each learner checks the final draft before handing it in. Learners could

use the following self-evaluation questions:

i. How well did I do?
ii. Is this the best I can produce under the circumstances?
iii. What could I have done differently?
iv. Do I need to cancel and re-do certain sections of this summary?

3.5.8.2 **Control Groups**

Control groups used in the experiment were given unguided instruction on summarisation. The researcher introduced and explained the following summarisation rules.

SUMMARISATION RULES

i. Select the key ideas

ii. Cancel/delete trivia,material

iii. Substitute superordinate terms with one word

e.g. list of words with one word
cats, dogs, horses = ANIMALS

iv. Use complete sentences to write the key ideas

v. Write in prose (one paragraph) or in point form

vi. Do not go beyond the word limit - count the number of words and reduce or add to this number in keeping with the required word limit.

vii. Write the number of words you have used in brackets at the end of the

summary.

Learners were then asked to write the summary of a given passage (see Appendix E).

3.6 NON-EXPERIMENTAL RESEARCH

3.6.1 Non-experimental Research Sample

Three hundred educators from thirty schools in ten circuits provided responses to the non-experimental research in the form of questionnaires. Twenty educators in this sample took part in the interviews and conducted lessons for the lesson observation techniques (see Table 1).

The aim of the non-experimental research methodology was to assess whether the teaching strategies used by educators are likely to develop metacognitive ability in learners.

3.6.2 Questionnaires

The questionnaire method was selected as one of the data collection methods because it is one method a researcher uses to gain access to what is "inside a person's head" (Tuckman 1994:196). It therefore makes it possible to measure a person's knowledge, values, preferences, attitudes and beliefs.

The questionnaire method provides greater assurance of anonymity to the respondents. This anonymity can lead to frankness on the part of the respondent because there is no fear of identification, particularly on private and sensitive issues. The questionnaire is also economical in terms of time and money. The researcher is given an opportunity to provide a larger, more representative sample (Bailey: 1982, Tuckman: 1994).

The main aim of the questionnaire was to explore the teaching styles of educators in order to assess to what extent prerequisites for metacognition are present in the practice of educators.

There was an attempt to assess the educators' beliefs and philosophies on the practice of teaching in order to establish whether educators are reflective professionals who are capable of developing reflective, metacognitive learners (see Appendix A).

The questionnaires had the following sections:

The first Section (A) contained information on the school - its location, circuit and district category. It also provided information on gender, academic and professional qualifications, position in the school, age categories and teaching experience of the respondents.

The second Section (B), was an evaluation of the teaching styles of educators. Respondents were asked to provide information on teaching methods, their teaching characteristics, preferred teaching environments, room designs, educational philosophies, beliefs and evaluation techniques. This section was an in-depth assessment on the educators and their beliefs about teaching. The idea is that the educators' beliefs about the practice of teaching have direct implications on what they do in the classrooms.

3.6.3 **Interviews**

The interview is used extensively as a key technique of data collection in educational research. It is a method where a researcher asks selected respondents questions related to the study through conversational encounters. There are different types of interviews. These types include the structured interview, semi-structured interview and unstructured interview. This study employed the use of the semi-structured interview. It was chosen in the study to complement the questionnaire and observation

methods.

3.6.3.1 Semi-Structured Interviews

The semi-structured interview was chosen because of its flexibility. According to Hitchcock and Hughes (1989), it is a data collection method which tends to be most favoured by educational researchers since it allows depth to be achieved by allowing the researcher to probe and expand the interviewee's responses. There is room for negotiation, discussion and expansion of the interviewee's responses.

The use of the interview reduces non-responses to a minimum. However, the main disadvantage of this technique of data collection is that it remains a costly exercise in terms of time and money (Best and Kahn: 1993). This places great limitations on the number of subjects that could be interviewed in a study. The number of respondents selected for the semi-structured interview was limited to twenty in this study.

The questions used in the interview were evaluating to what extent educators aim to develop metacognition in their learners. Aspects of the educator's teaching style preferences and beliefs were evaluated to establish whether the strategies they use can be considered useful in developing metacognition (see Appendix B).

3.6.4 Classroom Observation

Classroom observation was used as a data collection technique in this study for several reasons. Firstly, observation gives the researcher first-hand access to data on aspects that may not be honestly or accurately recorded in a questionnaire or interview. Secondly, it allows one to record behaviour as it occurs.

Observations have three primary uses in research namely: initial exploration of a problem, supplementary information and primary data in a study (Eichelberger: 1989, Tuckman: 1994). In this study, it was used to perform the second function, to provide

supplementary information in evaluating the practice of educators in an attempt to establish whether it promotes the development metacognitive ability in learners.

In order to check the reliability and validity of data obtained in an observation, the researcher used a pre-designed form or a checklist. This metacognitive environment checklist was used to assess classroom environments and teaching strategies using identified prerequisites for metacognition.

3.6.4.1 **Metacognitive Environment Checklist**

The checklist had three sections. Section A contained information on the provision of resources that are imperative in stimulating metacognitive ability in learners. Such resources include the provision of a library, ample reading material like newspapers and supplementary texts.

Section B was meant to evaluate the extent to which the classroom design in the schools conforms to the characteristics of an ideal situation that would foster the metacognitive development of learners. The inventory included a checklist on the availability of mental stimuli objects like charts, student work displays and bulletin boards.

The last section, Section C contained items that would evaluate the presence or absence of metacognitive awareness or skills on the part of the educators. The list includes information on teaching strategies, effective presentation skills and monitoring of learning (see Appendix C).

3.6.5 **Summary**

The research methodology in the form of experimental and non-xperimental research was discussed in this chapter. The next chapter is a full presentation and analysis of the data obtained from the study and analysis of the findings.

CHAPTER FOUR

4.0 DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

The main purpose of this study was to identify and propose useful teaching strategies for developing metacognition in learners. An experiment was conducted in eight Grade 12 classes to test the effectiveness of selected metacognitive teaching strategies in developing summarisation skills in English Second Language Learners. The nature of the experiment, the methods used, the analysis of the findings and conclusions made on this experiment are presented in this chapter.

Apart from identifying useful metacognitive teaching strategies, the investigation was also an attempt to establish whether educators in the North West Province of South Africa make use of teaching strategies that could be considered useful in developing metacognition in learners. The focus was on examining the extent to which prerequisites for developing metacognition exist in the practice of educators in the North West Province of South Africa. To test this aspect, the researcher made use of non-experimental data collection techniques, namely questionnaires, interviews and classroom observations. The full description and analysis of the findings are also discussed in this chapter.

4.2 Experimental Research on Metacognitive Teaching Strategies

4.2.1 Multivariate Analysis and the Experiment

An experiment was conducted and results were obtained by using multivariate analysis - T^2 test. This study made use of multivariate analysis in the comparison of means from different contexts. Multivariate techniques are useful in and a valuable aid to the interpretation of data from a number of contexts. Scientific investigations

which use multivariate techniques use these methods for the following reasons:

(i) Data reduction or structural simplification: The phenomenon that is studied is represented as simply as possible without sacrificing valuable information. It is hoped that multivariate analysis will make interpretation easier.

(ii) Sorting and Grouping: Groups of "similar" objects or variables are created, based upon measured characteristics. Alternatively, rules for classifying objects into well defined groups may be required.

(iii) Investigation of the dependence among variables: The nature of relationships among variables is of interest. The researcher may be interested in finding out whether variables are mutually independent or whether one or more variables are dependent on the others.

(iv) Prediction: The researcher may be interested in the relationships between variables. Such relationships must be determined for the purpose of predicting the values of one or more variables on the basis of observations on the other variables.

(v) Hypothesis Construction and Testing: The researcher may be testing specific statistical hypotheses, formulated in terms of the parameters of multivariate populations (Johnson and Wichern: 1998).

This study made use of multivariate analysis for hypothesis testing.

4.2.2 **The T^2 test in Multivariate Analysis**

The T^2 is a statistic for testing the quality of vector means. It is appropriate for comparing means from a number of experimental settings. It is appropriate for data reduction or structural simplification in the comparison of such data (Johnson and Wichern: 1998).

The T^2 test was used in this study to compare the mean vectors from the various settings used in the study.

4.2.3 **The Aim of the Experiment**

The aim of this experiment was to investigate the effect of metacognitive teaching strategies on the summarisation skills of Matric level English second language learners. The main idea behind this procedure was to test the effectiveness of metacognitive teaching in developing learning skills.

The experiment was designed to answer the following research question: Are there any differences in achievement between learners who receive metacognitive teaching strategies and those who are exposed to other strategies of teaching?

4.2.4 **Context**

School A

The school is a typical urban high school with second language learners of English. It is a well established school with a record of good Matric results (60% - 80%).

School B

This is a fairly new high school in a peri-urban area on the outskirts of the city. From the time of its inception about six years ago, it has not established a good record of Matric passes (20% - 40%). The school is fairly small with a total enrolment of less than four hundred learners. Learners are second language speakers of English. All in all it suffers from an obvious lack of resources and a good learning environment.

School C

The school is located in a rural area that is almost fifty kilometres from the city. It is an old, but well established high school with a good academic record (60% - 70%). The learners are second language speakers of English.

School D

This school represents a typical urban technical high school with a curriculum that combines commercial and academic subjects. The learners are second language speakers of English. The academic record of the school is fairly good, but cannot be classified as outstanding (50% - 60%).

4.2.5 **Procedure**

The experiment followed typical procedures for investigating cause - and - effect relationships. The researcher used two classes that were randomly selected from the Grade 12 classes in each of the four described schools. In each case, one class represented the experimental group and the other control group with forty learners in each class.

The number of Grade 12 classes varied from one school to another. In each instance, two mixed ability classes with the same record of achievement were selected.

Each class was given a pretest on summarisation skills. In other words, the experimental class and the control class in each school received the first test on summarisation. The results of this test were noted for the eight classes in four schools. The experimental classes received training in metacognitive skills as they relate to summarisation in English in one hour sessions for five days. The control classes received unguided instruction on summarisation. The classes were finally given a posttest on summarisation.

In order to establish whether there were any differences in achievement between the pretest and the posttest in all groups the difference between the pretest and the posttest was calculated.

Definitions

D_1 = School A_1 (Pretest - Posttest)

D_2 = School A_2 (Pretest - Posttest)

D_3 = School B_1 (Pretest - Posttest)

D_4 = School B_2 (Pretest - Posttest)

D_5 = School C_1 (Pretest - Posttest)

D_6 = School C_2 (Pretest - Posttest)

D_7 = School D_1 (Pretest - Posttest)

D_8 = School D_2 (Pretest - Posttest)

Each learner was given a pretest on summarisation. After five days the posttest was given. In each case. the difference between the score for the pretest and the score for the posttest was calculated as follows:

Student 1.	10	-	13	=	-3
	(Pretest Score)		(Posttest Score)		

Student 2.	9	-	4	=	5
	(Pretest Score)		(Postest Score)		

The procedure was done for each of the forty learners in each group (see Appendix F). The mean was obtained for each of the eight groups. The following summary statistics indicate the figures obtained (i.e. means of each of the eight groups in matrix).

4.2.6 **Summary Statistics**

NB: d is the mean matrix

	- 3.625
	1.300
	-3.350
	-0.225
d =	-2.400
	0.950
	-3.125
	-0.075

If the mean is negative in [Pretest - Posttest] it indicates an improvement in performance. If the mean is positive, it means that there is no improvement in performance between the pre-test and the post-test. The above figures indicate a significant improvement in four experimental groups. There was a slight improvement in two control groups and no improvement in two control groups.

The following table is a covariance matrix for the eight classes used in the experiment: (The statistical package used here is Version II of the minitab statistical package).

TABLE 3: COVARIANCE MATRIX

	D_1	D_2	D_3	D_4	D_5	D_6 -	D_7	D_8
D_1	8.55	-4.22	0.20	-0.63	-1.90	-0.03	-1.34	0.44
D_2	-4.22	9.60	-0.38	-2.75	1.10	0.71	-0.91	-2.49
D_3	0.20	-0.38	5.11	-0.72	0.01	2.24	0.57	0.92
D_4	-0.63	-2.75	-0.72	7.05	0.16	0.99	1.15	0.19
D_5	-1.90	1.10	0.01	0.16	3.58	-0.28	-0.46	0.05
D_6	-0.03	0.71	2.24	0.99	-0.28	8.10	-3.34	-0.06
D_7	-1.34	-0.91	0.57	1.15	-0.46	-3.34	6.83	-0.19
D_8	0.44	-2.49	0.92	0.19	0.05	-0.06	-0.19	4.74

4.2.7 **Method**

The T^2 test was used to compare the means from the eight groups used in the study. In order to compute the figure's required in the T^2 test the following scores had to be obtained:

Sd - the covariance matrix

n - Number of observations per class = 40

p - Number of classes = 8

Significance Level (L) = 0.05 (5%)

The null hypothesis stated that there is no difference in performance between the pretest and the posttest for all the groups. The alternate hypothesis stated that there is a difference in performance between the pretest and the posttest for all the groups.

The null hypothesis is rejected at L % level of significance if

$$T^2 = nd^{-1} S_d\text{-}1^d \quad \frac{(n-1)p}{(n-p)} Fp;\ n\text{-}p\ (L)$$

where Fp_1 n-p (L) is the upper (100L) percentile of an F - distribution with p and n-p degrees of freedom (Johnson and Wichern: 1998).

Results

The following results were obtained from the data:

$$T^2 = 1701.48$$

$$\frac{(n-1)p}{} F_{8,32}(005) = \frac{39x8}{32} \times 2.244$$

$$= 21.879$$

Since 1701.48 is greater than 21.879 it was concluded that there is enough evidence to reject the null hypothesis at 5% level of significance. This implies that in at least

95% of the students surveyed there was a difference in the pre-test and post-test results.

4.2.8 **Analysis**

An analysis of the means of each group reflects a remarkable difference in performance in the experimental groups.

TABLE 4: MEANS FOR EXPERIMENTAL AND CONTROL GROUPS

School	Experimental Groups	Control Groups
	Mean	Mean
School A.	-3.625	1.300
School B	-3.350	-0.225
School C	-2.400	0.950
School D	-3.125	-0.075

School A

In School A. the mean for the experimental group that received metacognitive training is -3.625 and the mean for the control group is 1.300. This result indicates that for the experimental group. there was a remarkable improvement between the pre-test and the posttest. The mean for the control group indicates that there was no improvement in the performance of the group between the pre-test and the posttest. The improvement in the experimental group is attributed to metacognitive training.

School B

In School B. the mean for the experimental group that received metacognitive training is -3.350 and the mean for the control group is -0.225. This result indicates a remarkable improvement in performance for the experimental group between the pre-test and the posttest. The result for the control group indicates a slight improvement in performance between the pre-test and posttest for the control group. This slight improvement could be attributed to the fact that although this group did not receive any metacognitive training. the students had now received practice in summarisation.

School C

In School C, the mean for the experimental group is -2.400 and the mean for the control group is 0.950. This result indicates great improvement in performance for the experimental group between the pre-test and posttest and no improvement for the control group between the pre-test and the posttest. The remarkable improvement in the performance of the experimental group is a result of the five one-hour sessions that the group received in metacognitive training.

School D

In School D, the mean for the experimental group is -3.125 and the mean for the control group is -0.0075. This result reflects a remarkable improvement in performance in the students who received metacognitive training between the pre-test and the posttest. This improvement is a direct result of the training in metacognitive strategies. The group that received unguided instruction reflected a very slight, almost negligible improvement between the pre-test and the posttest. This improvement is very slight when compared to the improvement of the experimental group. The results indicate the effectiveness of metacognitive teaching strategies in improving the performance of learners in the summarisation skills.

The figures reflected in Table 4 indicate a significant improvement in the performance of the four experimental groups. These groups received one hour sessions for five days in metacognitive training as they apply to summarisation in English. From the four groups that received unguided instruction, two groups reflected a slight improvement in performance which could be attributed to the fact that the learners had gained practice in writing summarisation in the pre-test. The other two groups had no improvement in performance between the pre-test and the posttest.

4.2.9 **SUMMARY**

The findings of this experiment reflect the effectiveness of metacognitive teaching

strategies in improving the summarisation skills of learners. Although the experimental groups received limited training in metacognitive teaching strategies, the remarkable improvement in the performance of these learners in the post-test indicates that the use of such strategies in the daily practice of educators could lead to improved performance in developing identifiable learning skills in secondary school learners.

This section presented the findings and analysis of the results obtained from the experimental research methodology used in the study. The next section includes the results and analysis of the non-experimental data collection methods used in the study.

4.3 NON-EXPERIMENTAL RESEARCH ON THE PRACTICE OF TEACHING AND METACOGNITION

4.3.1 INTRODUCTION

This section provides the findings and the analysis of data obtained from the non-experimental data collection techniques used in the study; namely questionnaires, interviews and classroom observations.

The second major purpose of this study was to establish the extent to which educators in secondary schools in the Mafikeng, Lichtenburg and Zeerust Districts in the North West Province make use of teaching strategies that are likely to facilitate the development of metacognition in learners. Responses were elicited from the secondary school educators in the following questions identified in the study:

4.3.1.1 What teaching strategies do secondary school educators prefer to use in their daily practice of teaching?

4.3.1.2 Which of these teaching strategies employed by educators could facilitate the development of metacognition?

4.3.1.3 To what extent do pre-requisites for developing metacognition exist in the practice of educators?

4.3.1.4 To what extent does the classroom and school environment foster the development of metacognition in learners?

4.3.2 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

The study sample was drawn from thirty secondary schools in ten school circuits in the North West Province (see Table 1). Three hundred valid responses were obtained from the questionnaire. Twenty educators out of the thirty schools were selected for the interview and classroom observation.

Table 5: BREAKDOWN OF SAMPLE BY GENDER

Gender	Frequency	Valid Percentage
Male educators	124	41.33%
Female educators	176	58.67%
TOTAL	300	100%

Table 5 illustrates the total number of respondents used in the questionnaire sample according to gender. One hundred and twenty-four male educaters and one hundred and seventy-six female educators represented secondary school educators. The sample represented a higher population of females than males, which is a reflection of population and gender demographics in the country.

Table 6: AGE DISTRIBUTION OF SAMPLE

AGE DISTRIBUTION OF SAMPLE		
Below 30 years	91	30.33%
30 - 40 years	171	57%
Above 40 years	38	12.67%
TOTAL	300	100%

An analysis of the ages of respondents revealed that thirty point thirty-three percent (30.33%) were below thirty years of age; fifty-seven percent (57%) were between thirty and forty years and only twelve point sixty-seven percent (12.67%) were above forty years of age. About eighty-seven point thirty three percent (87.33%) are below the age of forty (40 years). This indicates that the province generally has a fairly young group of professionals.

Table 7: BREAKDOWN OF SAMPLE BY ACADEMIC QUALIFICATIONS

Academic Qualification		Frequency	Percentage
1.	Below Std 10	5	1.7%
2.	Std 10	138	46.0%
3.	Junior Degree	113	37.6%
4.	Honours Degree	32	10.7%
5.	Masters Degree	12	4.0%
	TOTAL	300	100%

Only one point seven percent (1.7%) of the educators in the sample have academic qualifications below Standard 10 or Matric level. This projects a very small number of educators without Matric level certificates.

There were forty-six percent (46%) educators with Matric qualifications. thirty-seven point seven percent (37.7%) with Junior degrees. ten point seven percent (10.7) with Honours degrees and four percent (4) with Master's degrees. It is worth noting that

forty-eight point four percent (48.4%) of the educators in the sample (about half of the sample) have junior to honours degrees. This projects degreed and non-degreed respondents more or less equally represented in the sample.

Table 8: PROFESSIONAL QUALIFICATIONS OF RESPONDENTS

Professional Qualifications	Frequency	Percentage
1. Untrained	4	1.3
2. Primary Teachers Course	11	3.7
3. Secondary Teachers Course	103	34.3
4. University Professional Degree	99	33.0
5. University Professional Diploma	83	27.7
TOTAL	300	100%

One point three percent (1.3%) of the respondents in the sample were professionally unqualified. Three point seven percent (3.7%) have primary teacher's courses. One realises that these educators who are primary trained are employed in high schools. Thirty-four point three percent (34.3%) of the educators in the sample have secondary teachers courses, while thirty-three percent (33%) have university professional degrees and twenty-seven point seven (27.7%) have university professional diplomas.

An overall analysis of these figures indicates that the majority of educators in the sample are relatively well qualified in terms of professional qualifications.

Table 9: TEACHING EXPERIENCE OF RESPONDENTS

Teaching Experience	Frequency	Percentage
0 - 5 years	89	29.7
6 - 10 years	151	50.3
11 - 15 years	34	11.3
15 - 20 years	15	5.0
above 20 years	11	3.7
TOTAL	300	100%

An analysis of the years of teaching experience of the respondents revealed that twenty-nine point seven percent (29.7%) have five years or less of teaching experience. Fifty point three percent (50.3%) have between six and ten years of teaching experience. One could say that approximately over half of the respondents in the sample, eighty percent (80%) have up to ten years teaching experience. Approximately twenty percent (20%) are experienced educators with over ten years of teaching experience.

4.3.3 **RESEARCH RESULTS: Instructional Groups**

4.3.3.1 **Instructional Groups: Educators' beliefs and practice on the use of learning groups**

In order for effective teaching and learning to occur, the educator needs to make decisions on the use of learning groups. This includes making decisions about how, when and why learners have to work in groups, pairs, individually or as a whole class. The choice of the size of instructional groups to be used in the lesson, and also the frequency with which the educators make use of a particular type of instructional group can affect the effectiveness of teaching and learning in the classroom.

Research participants were given questions on the type of groupings they prefer to use in their lessons. These questions were meant to evaluate the extent to which educators use interactive and collaborative activities as part of their teaching. Table 10 below indicates responses obtained on whole class groupings used by educators and the frequencies.

4.3.3.2 **The Use of Whole Class Groupings by Educators**

Table 10: TEACHING EXPERIENCE OF RESPONDENTS AND THE USE OF WHOLE CLASS GROUPS

TEACHING EXPERIENCE							
Whole Class Grouping Frequency	0-5 yrs	6-10 yrs	11-15 yrs	15-20 yrs	20 plus yrs	Total	%
Never	1	2	0	0	0	3	1.00
Once a month	0	1	1	2	0	4	1.33
Once in 2 weeks	0	0	1	1	1	3	1.00
Once a week	15	22	5	5	4	51	17.00
Everyday	73	126	27	7	6	239	79.67
TOTAL	89	151	34	15	11	300	100%

About seventy-nine point sixty-seven percent (79.67%) of the educators indicated a high preference for whole class teaching. This indicates that whole class teaching is a feature of their practice everyday. Seventeen percent (17%) of the educators use whole class lessons once a week, one point thirty three percent (1.33%) of the educators use this method of grouping once a month.

There might be possible reasons why educators tend to use whole class methods that lend themselves to teacher-centred lessons. This method enables the educator to teach a large number of learners at the same time. It could also be a reflection that educators still cling to chalk and talk methods that are not encouraged in the new Outcomes Based Education. In other words, the change to innovative instructional methods has not occurred. Respondents who took part in the interview sessions cited the large class sizes and shortage of resources as reasons for using whole class groupings.

An analysis of these results in relation to teaching experience indicates that there is a higher preference for whole class teaching in educators who have ten years or less of teaching experience. The demographic statistics according to teaching experience

of respondents indicate that there are one hundred and fifty-one (151) respondents with six to ten years of teaching experience. From this total, one hundred and twenty-six educators use whole class groupings on daily basis which is eighty-three point forty-four percent (83.44%) of the educators in this category of teaching experience.

4.3.3.3 The Use of Collaborative and Interactive Groupings: Pair and Groupwork

One of the major changes in the dynamics of classroom interaction brought about by learner-centred approaches has been the increasing emphasis on the use of group and pair work. Despite the need for whole class and individual work in certain instances, it has often been emphasized that without other forms of interaction, learners are deprived of many useful and motivating opportunities for learning (Richard and Lockhart: 1994).

Respondents were asked to indicate how many times they made use of group work and pair work in their daily practice. The following results were obtained:

Table 11: TEACHING EXPERIENCE OF RESPONDENTS AND THE USE OF GROUPWORK

	TEACHING EXPERIENCE						
Groupwork Frequency	0-5 yrs	6-10 yrs	11-15 yrs	15-20 yrs	20 plus yrs	Total	%
Never	11	20	4	2	2	39	13
Once a month	24	46	13	3	5	91	30.33
Once in 2 weeks	36	50	11	8	4	109	36.33
Once a week	11	28	6	2	0	47	15.67
Everyday	7	7	0	0	0	14	4.67
TOTAL	89	151	34	15	11	300	100%

The results obtained on the use of groupwork by educators indicated that only four point sixty-seven percent (4.67%) make use of groupwork daily in their teaching. Fifteen point sixty-seven percent (15.67%) use groupwork once a week (Table 11).

This finding indicates that groupwork is not a popular instructional technique among the educators.

Table 12 indicates educator preferences on the use of pairs in instruction.

Table 12: TEACHING EXPERIENCE OF RESPONDENTS AND THE USE OF PAIRS

TEACHING EXPERIENCE							
Pairwork Frequency	0-5 yrs	6-10 yrs	11-15 yrs	15-20 yrs	20 plus yrs	Total	%
Never	37	47	5	4	4	97	32.33
Once a month	35	57	13	3	3	111	37.00
Once in 2 weeks	12	33	1	4	3	63	21.00
Once a week	3	12	4	4	1	24	8.00
Everyday	2	2	1	0	0	5	1.67
TOTAL	38	151	34	15	11	300	100%

Only one point sixty-seven percent (1.67%) of the educators make use of pairwork in their daily instruction. Only eight percent (8%) use pairs once a week. twenty-one percent (21%) of the educators in the sample use pairs once per fortnight.

It is quite significant that about sixty-nine point thirty-three percent (69.33%) of the educators. over half of the sample. use this grouping method once a month or never at all. Both groupwork and pairwork do not feature strongly in the practice of educators.

4.3.4 RESEARCH RESULTS: Instructional Approaches and Concepts

Effective teaching and learning occurs when the educator is capable of identifying and selecting instructional approaches which give purpose and direction to the lesson.

Educators need a wide repertoire of instructional models in order to meet diverse goals and demands of a variety of lessons. A single approach or method is no longer

sufficient for meaningful instruction to occur. It is therefore essential for each educator to have the knowledge and the versatility to apply or experiment with a wide range of teaching strategies.

One of the major aims of this study was to identify the extent to which educators use teaching strategies that could facilitate the development of metacognition in learners. In order to establish answers to this aspect, educators were asked to indicate instructional approaches and concepts they use in their teaching.

4.3.4.1 Inquiry Models: Problem Solving and Discovery

Problem-based instruction was developed to help learners develop their thinking, problem-solving and intellectual skills. Through real or simulated situations learners develop to become independent, autonomous learners (Arends: 1997).

Investigation, whether done independently, in pairs or groups is the centre of problem-based instruction. The process involves data gathering and experimentation hypothesis, explaining and providing solutions. Throughout the process, a combination of individual and cooperative efforts help learners to be autonomous and also collaborative.

Educators were asked to indicate how frequently they use problem-solving and discovery approaches in their teaching. The following results were obtained:

Table 13: THE USE OF PROBLEM-BASED INSTRUCTION

	Frequency	Percentage
Never	80	26.7
Once a month	99	33.0
Once in 2 weeks	88	29.3
Once in a week	26	8.7
Everyday	7	2.3
TOTAL	300	100

Results obtained on the use of problem based instruction indicated that only two point three percent (2.3%) of the educators in the sample use problem-based instruction everyday, only eight point seven (8.7%) use this type of instruction at least once a week, twenty-nine point three percent (29.3%) use problem-based instruction once in two weeks. Thirty-three percent (33%) of the educators use problem based instruction once a month and twenty-six point seven percent (26.7%) of the educators do not use this type of instruction at all. These results indicate that over half of the educators, fifty-nine point seven (59.7%) almost never use this type of instruction in their lessons.

4.3.4.2 Reciprocal Teaching

Reciprocal teaching is a form of instruction that requires educators to become modellers and facilitators than presenters in the learning process. Educators teach learners metacognitive skills by creating learning experiences in which they model particular behaviours and then help learners to develop these skills by providing them with encouragement and support. Learners take turns in leading discussion groups on what are called four specific, self-regulated comprehension strategies in language lessons: summarizing, asking questions, clarifying and predicting. The educator provides leadership only as mediator, modeller and coach during these sessions.

In this study educators were asked whether they use reciprocal teaching at all and if they did, they had to indicate how frequently this method featured in their practice. The aim of this question was to establish if at all educators were aware of this instructional approach that is considered useful in facilitating metacognition and also to find out to what extent they used this form of instruction. Table 14 illustrates the responses obtained on reciprocal teaching.

Table 14: THE USE OF RECIPROCAL TEACHING

	Frequency	Percentage
Never	193	64.4
Once a month	85	28.3
Once in fortnight	22	7.3
Once a week	0	0
Everyday	0	0
TOTAL	300	100

Results obtained on reciprocal teaching revealed that sixty-four point four percent (64.4%) of the educators in the study never use reciprocal teaching in their practice of teaching. About twenty-eight point three percent (28.3%) use it once per month. A close analysis of these figures raised a possibility that the majority of educators have no knowledge of this concept. The interview sessions revealed that none of the educators had information on what reciprocal teaching was. It was a new concept that they had not encountered before.

4.3.4.3 Direct Instruction

Direct instruction is a teaching approach that is useful in teaching basic skills and facts. It is most useful in teaching skills that can be broken into small segments or knowledge which can be organised in a step-by-step fashion. When used with other methods in an instructional design, direct instruction is an effective instructional tool (Gunter et al: 1995). However, when it is used exclusively or excessively it becomes a disadvantage for learners because it is largely teacher-dominated and might lessen the development of independence and self-regulation in learners.

Respondents in the study were given a question on how frequently they use direct instruction. This question was designed to investigate to what extent they use this instructional approach in their teaching. The results of these findings are indicated in Table 15.

TABLE 15: THE USE OF DIRECT INSTRUCTION

	Frequency	Percentage
Never	1	.3
Once a month	6	2.0
Once in two weeks	14	4.7
Once a week	74	24.7
Everyday	205	68.3
TOTAL	300	100

Direct instruction appears to be one of the popular instructional techniques used by respondents in the study. Almost seventy percent, (sixty-eight point three percent 68.3%) of the educators use direct instruction daily. When one compares the use of direct instruction with the other methods like problem-solving and reciprocal learning one sees a significant preference for teacher-centred teaching in the respondents. This indicates that even with the introduction of Outcomes Based Education and learner-centred teaching, the appreciation for learner-centredness in instruction has not occurred.

4.3.4.4 **Note-taking**

Research shows that taking notes aids learning. Taking notes helps learners to organize and remember lesson material. Done correctly and not excessively note taking can aid learning (Gunter et al: 1995).

Note-taking can be done effectively or ineffectively in instruction. Many learners are ineffective note-takers. Such learners copy or attempt to write down everything said or written by the educator. Effective note-takers capture the main ideas and write them independently in a way that is meaningful and understandable to them.

The aspect of note-taking was investigated for a number of reasons. The researcher had noted the prevalence of giving notes to learners in five schools in the North West Province. Note-taking cannot replace instruction. If used excessively, it stifles the

learner's ability to be independent and self-regulated. If used appropriately and sparingly, it can foster self-regulation and autonomy as the learner makes sense of what he has learnt by summarising key ideas independently (Cruishank: 1985).

TABLE 16: THE USE OF NOTE-TAKING ACTIVITIES

	Frequency	Percentage
Never	5	1.67
Once a month	12	4.0
Once in two weeks	10	3.33
Once a week	77	25.7
Everyday	196	65.3
Total	300	100

The aspect of note-taking featured strongly in the practice of educators. Almost seventy percent of the respondents (sixty-five point three percent. 65.3%) in the study give notes to learners on a daily basis. When one considers the contemporary thinking on instruction, that educators should use a variety of approaches and also learner centred methods, it appears that educators favour teacher-controlled activities like note-giving.

Lesson observations used in the study showed that most learners copy notes given by the educator directly from the board without any amendment, summarisation or input on the notes. One realises that such learning activities cannot foster the development of independent, self-regulated learning in learners.

4.3.4.5 Planning and Self-Regulation

According to the researcher's observations during her years of teaching in five schools in the North West Province of South Africa, learners are very rarely given opportunities to make critically informed decisions about what to learn and how to learn. From time to time learners need opportunities to make planning decisions.

The quality of instruction in a classroom can be determined largely by whether the learners have a vested interest in the instruction and in their own learning. They have to care about what happens in the classroom and be willing to cooperate to reach shared goals. If the outcomes of learning are to be achieved, the learners' willingness to adopt the teacher's instructional outcomes as their own plays a major role.

> We are not advocating that teachers plan their instruction based on what students are willing to say they want to learn, even though that can often be taken into account. We do advocate that teachers share the process of their own planning for instruction with their students (Gunter et al: 1995).

By involving learners in some of the activities, planning learning becomes a cooperative exercise between the educator and learners. It is important for educators to give learners opportunities to develop decision-making ability by giving opportunities for planning and self-regulation to learners. This involves situations where learners set goals and design studies or programmes. Learners acquire the ability to set goals and implement whatever decisions have been set through self-monitoring and self-regulation. In this study, educators were asked whether they give learners opportunities to design their own studies. The following results were obtained:

TABLE 17: RESPONDENTS AND LEARNERS WHO DESIGN THEIR OWN STUDIES

	Frequency	Percentage
Never	156	52.0
Once a month	93	31.0
Once a fortnight	39	13.0
Once a week	10	3.3
Everyday	2	.7
TOTAL	300	100

Results obtained on the aspect of giving learners opportunities for planning and self-regulation revealed that about half of the respondents in the sample do not give

learners any practice in this aspect. Fifty two percent (52%) of the respondents never give learners a chance to design their studies. One realises that the majority of educators are not conscious of the powerful role this aspect of goal setting and designing studies could play in developing independent, self-regulated learners.

4.3.4.6 Self-Questioning

4.3.4.6.1 The Use of Self-Questioning in the Classroom

Self-questioning or self-interrogation plays an important role in helping learners to monitor their progress in the achievement of learning tasks independently. Self-questioning is an important metacognitive strategy because learners can control their thinking processes by asking themselves questions that check on understanding and progress.

Respondents were given a question on how often they encourage learners to ask themselves questions inwardly as they work. The following results were obtained on the relationship between gender and the aspect of encouraging self-questioning in learners.

TABLE 18: GENDER OF RESPONDENTS AND THE USE OF SELF-QUESTIONING

	Never	Once a month	Once in 2 weeks	Once a week	Daily	Total
Male Educators	91	24	7	2	0	124
Female Educators	116	44	7	9	1	176
TOTAL	207	68	14	11	1	300
PERCENTAGE	69	22.7	4.67	3.33	.33	100

Sixty-nine percent of the respondents do not encourage their learners to engage in the metacognitive skill of self-questioning in their practice of teaching. Very few educators, four point sixty-seven percent (4.67%) remind their learners to engage in

self-questioning once per fortnight. An equally negligible number of educators in the sample, three point thirty-three percent (3.33%) remind the learners once a week to engage in self-questioning. One realises that the aspect of self-questioning in instruction does not appear to be part of the practice of educators.

The interviews revealed that educators take this aspect for granted. When learners are given a task, it is assumed that they possess the metacognitive capability to question themselves and correct mistakes in the process of executing learning tasks.

4.3.4.6.2 **Modelling Self-Questioning: Educators**

In order for educators to help learners to verbalise their thinking processes in order to check progress on the accomplishment of learning tasks and to make corrections if necessary, it is vital that educators should model self-questioning. This involves "thinking aloud" as one checks through the stages of accomplishing a task.

Educators were asked to indicate how often they verbalised their thoughts, their thinking processes as they taught learners in the classroom. Table 19 indicates the results.

TABLE 19: TEACHING EXPERIENCE OF RESPONDENTS AND THE ASPECT OF VERBALISING THOUGHTS

	0-5 yrs	6-10 yrs	11-15 yrs	16-20 yrs	above 20 yrs	Total	Percentage
Never	67	112	21	10	8	218	72.67
Once a month	14	32	7	3	3	59	19.67
Once in 2 weeks	5	4	5	0	0	14	4.67
Once a week	2	2	1	0	0	5	1.66
Daily	1	1	0	2	0	4	1.33
Total	89	151	34	15	11	300	100.00

Almost three quarters of the respondents do not model self-questioning; that is, seventy-two point sixty-seven percent (72.67%) (Table 19). An overall analysis of

these results indicates that educators do not value the modelling of self-questioning to learners, or to encourage learners to verbalise their thoughts when working on learning tasks.

Interviews used in the study revealed that most educators consider the aspect of "thinking aloud" or verbalising one's thoughts to clarify thinking processes in the accomplishment of tasks as absurd. Most of them indicated the risk of being considered an insane educator if "one talks to oneself".

From a different perspective, one realises that for certain learners, the educator has to model self-questioning so that learners value the idea of self-questioning which they would never see since it takes place inside a person's head.

4.3.4.7 **Resourcefulness in the Practice of Educators**

4.3.4.7.1 **Worksheets**

The use of resources in teaching provides a rich learning environment that is vital in promoting independent and self-regulated learning (Arends: 1997). The use of varied stimuli through an array of materials like bulletin boards, displays of students' work, taskcards, worksheets, charts and newspapers stimulate the learners' curiosity and motivate them to value learning from an independent, self-driven or self-regulated perspective.

The value of using task-cards or worksheets in lessons is to create task-oriented learners. Such learners are generally competent and successful in completing learning tasks. They work both independently or cooperatively to complete tasks with a high degree of accuracy (Richard and Lockhart: 1994).

Educators had to indicate how often they used either worksheets or tasks in their practice of teaching. The following results were obtained on the relationship between the teaching experience of respondents and the use of worksheets or task cards:

TABLE 20: TEACHING EXPERIENCE OF RESPONDENTS AND THE USE OF WORKSHEETS OR TASK-CARDS

	0-5 yrs	6-10 yrs	11-15 yrs	16-20 yrs	20 yrs Plus	Total	Percentage
Never	63	88	18	5	7	181	60.33
Once a month	17	53	13	7	2	92	30.67
Once in 2 weeks	9	10	2	3	2	26	8.67
Once a week	0	0	1	0	0	1	0.33
Daily	0	0	0	0	0	0	0
Total	89	151	34	15	11	300	100

- Pearson's r = 0.023

A statistical analysis of these results revealed that the relationship between teaching experience and the use of worksheets and/or task-cards is statistically significant at 0.023. It appears that the use of these resources improves with the number of years of teaching experience. However, it is worth noting that sixty point thirty-three percent (60.33%) never use worksheets or tasks-cards in the teaching. Only thirty point sixty-seven percent (30.67) of the respondents use worksheets at least once a month. It is worth noting that none of the respondents use worksheets daily and a very small percentage (.33%) use these resources once a week.

4.3.4.7.2 **Charts**

Respondents were asked to indicate the frequency with which they use charts in their teaching. The following results were obtained:

TABLE 21: THE USE OF CHARTS

	0-5 yrs	6-10 yrs	11-15 yrs	16-20 yrs	20 yrs Plus	Total	Percentage
Never	33	65	12	3	4	117	39
Once a month	30	55	13	6	6	110	36.7
Once in 2 weeks	23	27	8	4	1	63	21
Once a week	3	3	1	2	0	9	3
Daily	0	1	0	0	0	1	.3
Total	89	151	34	15	11	300	100

A close analysis of these results reveals that seventy-five point seven percent (75.7%) of the educators in the sample use charts once a month or never. One realises that educators do not value the use of media in their practice of teaching. This indicates that rich learning environments that are vital in developing metacognition are lacking.

4.3.5 **RESEARCH RESULTS: Classroom Designs**

Classroom designs and seating arrangements indicate the interactive patterns used by educators in instruction. Seating arrangements used by educators can do a great deal to enhance the success of instruction. From the researcher's own experience, he/she is aware that if learners are exposed to the same pattern of seating daily, routine sets in and the motivation of learners is reduced.

Collaborative and other interactive forms of instruction are considered the most powerful models of contemporary instruction. Collaborative work that is learner-centred often involves groups and pairs of learners and circles and semi-circles are generally more effective for sharing information and discussion. Clusters of desks create an ideal setting of cooperative work. If classroom arrangements consist of rows of desks that are permanently arranged, it is a suggestion that instruction is mostly characterised by whole class, teacher-centred instruction. Teacher-centred instruction is not in keeping with new teaching approaches (Fostnot: 1989, French and Rhoder: 1992, Jones et al: 1994).

Educators were asked to indicate how often they used the following classroom designs: rows of desks, small groups, half-circle and a variety of areas. The main idea was to check how flexible educators were in applying different seating patterns and groupings in instruction. The following responses were obtained on the use of rows of desks:

TABLE 22: RESPONDENTS AND THE USE OF CLASSROOM DESIGNS

	Below 30 yrs	30-40 yrs	above 40 yrs	Total	Percentage
Never	1	2	3	6	2
Once a month	3	5		8	2.7
Once in 2 weeks	1	9	3	13	4.3
Once a week	27	36	10	73	24
Daily	5	119	22	200	67
TOTAL	59	171	38	300	100

Results revealed that sixty-seven percent (67%) of the educators use rows of desks everyday. Twenty-four percent (24%) use rows of desks once a week. Only four point three percent (4.3%) uses rows of desks once per fortnight. Two percent (2%) never use rows in their classroom designs.

These figures reveal that two-thirds of the educators use rows of desks daily. This suggests teacher-centred whole class approaches to teaching. About 79%, seventy-nine percent of the educators indicated the daily use of whole class teaching methods.

Respondents were asked to indicate how frequently they used the small group classroom design in instruction. The relationship between age and the small group classroom design was measured. The following results were obtained:

TABLE 23: AGE OF THE RESPONDENTS WITH RESPECT TO THE USE OF SMALL GROUP CLASSROOM DESIGN

	Below 30yrs	30-40 yrs	40 yrs plus	Total	Percentage
Never	8	14	10	32	10.67
Once a month	22	38	4	64	21.33
Once in 2 weeks	40	85	15	140	46.67
Once a week	13	23	6	42	14
Daily	8	11	3	22	7.33
TOTAL	91	171	38	300	100

Pearson's r = .122

Results obtained on the use of small groups classroom designs indicated that only seven point three percent (7.3%) of the educators use this design daily. Fourteen percent (14%) use it once a week (Table 23). From these figures one observes that out of the average seven to eight lessons in the subject per week only one lesson adopts the small group classroom design.

The result obtained on the association between age and the use of small groups indicates that there is no relationship between the age of the respondents and the use of small groups. The statistical measure of Pearson's r was calculated and the result was .122. This is not a popular classroom arrangement with most educators.

Respondents were also asked to indicate how often they used a variety of areas in the classroom for teaching. The following results were obtained:

Table 24: AGE OF RESPONDENTS AND THE USE OF A VARIETY OF AREAS CLASSROOM DESIGN

	Below 30 yrs	30-40 yrs	Over 40 yrs	Total	Percentage
Never	69	128	29	223	74.3
Once a month	15	33	9	57	19
Once in 2 weeks	6	8	2	16	5.33
Once a week	1	0	0	1	0.37
Daily	0	2	1	3	1
TOTAL	91	171	38	300	100

About three quarters of the respondents, namely, seventy-four point three percent (74.3%) do not use this innovative classroom design. They never use a variety of areas to stimulate learner interest in the lesson. Nineteen percent (19%) use this design once a month. Only one percent (1%) use it daily (Table 24).

Table 25 summarises the daily use of the various designs from the most popular to the least popular.

Table 25: POPULARITY OF SELECTED CLASSROOM DESIGNS

Classroom Design	Percentage of Educators who use it Daily
Rows of Desks	67%
Small Groups	7.33%
A variety of areas	1%

Table 25 indicates the overwhelming preference for the rows-of-desks classroom design that is clearly linked to teacher-centred, whole class approaches to teaching.

4.3.6 RESEARCH RESULTS: Assessment Strategies and Techniques

4.3.6.1 The Use of Self-Assessment Strategies

Evaluation can promote or stifle metacognition in learners. Apart from the evaluation

made by the educator in the form of teacher-made tests and observations, learners should be exposed to self-evaluation. This develops in them the ability to control and monitor their learning through rechecking and self-correction strategies.
Educators were asked to indicate how often they used self-assessment strategies with their learners. Table 26 indicates the responses obtained on this aspect.

Table 26: AGE OF RESPONDENTS AND THE USE OF SELF-ASSESSMENT STRATEGIES

	Below 30 yrs	30-40 yrs	Over 40 yrs	Total	Percentage
Never	49	114	21	184	61.37
Once a month	34	43	13	90	30
Once in 2 weeks	3	9	3	15	5
Once a week	5	2	0	7	2.3
Daily	0	3	1	4	1.33
TOTAL	91	171	38	300	100

Sixty-one point thirty seven percent (61.37) of the educators in the study never use self-assessment strategies with their learners. Five percent (5%), or less use self-assessment strategies once a fortnight. One realises that self-assessment strategies of evaluation are largely not favoured by the majority of educators.

4.3.6.2 Peer Evaluation

Peer evaluation can be an excellent stimulus to provoke learners to work hard. Learners are compelled to do better than their peers when they are observed and graded by them. As the focus shifts from the educator becoming the chief evaluator, learners take more responsibility towards internalizing the goals of learning in order to evaluate other learners effectively. Learners are encouraged to be independent and objective in their evaluation of other learners. They learn to be autonomous and self-regulated.

Respondents were asked to indicate how often they asked their learners to evaluate peers. Table 27 illustrates the results obtained in this aspect.

Table 27: AGE OF RESPONDENTS AND THE USE OF PEER EVALUATION

	Below 30 yrs	30-40 yrs	Over 40 yrs	Total	Percentage
Never	56	119	26	201	67
Once a month	24	43	8	75	25
Once in 2 weeks	10	6	4	20	6.67
Once a week	1	2	0	3	1
Daily	0	1	0	1	0.33
TOTAL	91	171	38	300	100

Sixty-seven percent (67%) of the respondents never use peer evaluation as a form of assessment (Table 27). The results obtained on learner self-assessment and peer evaluation are quite similar. About two thirds of the educators in the sample never use learner-self-assessment and peer-evaluation as part of their evaluation techniques. These forms of assessment were newly introduced in South Africa through Outcomes Based Education in 1998. These results serve to show that educators are still clinging to traditional forms of evaluation like teacher made tests. and examinations. Respondents were asked to indicate how often they used teacher-made tests and examinations. Table 28 indicates the results.

Table 28: AGE OF RESPONDENTS AND THE USE OF TEACHER-MADE TESTS

	Below 30 yrs	30-40 yrs	Over 40 yrs	Total	Percentage
Never	2	3	1	6	2
Once a month	4	2	3	9	3
Once in 2 weeks	5	2	1	8	2.67
Once a week	12	27	8	47	15.67
Daily	68	137	25	230	76.66
TOTAL	91	171	38	300	100.00

Pearson's r = .06

Teacher-made tests rank quite highly in educator evaluation preferences. Over three-quarters of the educators in the sample use teacher-made tests daily.

The null hypothesis on the relationship between age and teacher-made tests stated that there is no relationship between the ages of the respondents and the use of teacher-made tests. The null hypothesis is rejected at .06 which indicates a relationship between age and the use of teacher-made tests. The older educators show a greater preference to the use of teacher-made tests than young educators. It is possible that older educators are more traditional and conservative because of their training.

The popularity of teacher-made tests suggests teacher-controlled, teacher-driven evaluation strategies. Contemporary instructional trends suggest that educator evaluation should be used in conjunction with other forms of evaluation in order to incorporate learners as co-workers or team members in a group with the educator as a co-learner and facilitator of learning.

4.3.7 **SUMMARY**

The main findings of non-experimental research methods used are summarised in this section. The major purpose of non-experimental research was to establish the extent to which educators use teaching strategies and practices that are likely to facilitate the development of metacognition in learners.

In order to work out educator profiles on the practice of teaching, responses were elicited from educators in the following areas:

1. **The use of groups in instruction**
2. **Instructional approaches and practices**
3. **Classroom designs**
4. **Assessment and techniques**

4.3.7.1 The Use of Groups in Instruction

The three groupings for instructional purposes selected were whole class groupings, groupwork and pairs.

Whole class teaching: 79.67 percent of the educators in the sample prefer the daily use of whole class teaching methods and 17 percent of the educators use it once per week.

Groupwork: 4.6 percent of the educators in the sample use groupwork daily, 15.6 percent of the respondents use it once per week.

Pairs: 1.67 percent of the educators use pairs daily, 8 percent of the educators use pairs once per week.

The pattern reveals an overwhelming preference for whole class teaching. Although useful, this approach leads to teacher-centred instruction which does not facilitate the development of metacognition in learners.

4.3.7.2 Instructional Approaches and Practices

Table 29 illustrates the daily and weekly use of selected instructional approaches and strategies.

Table 29: INSTRUCTIONAL APPROACHES AND PRACTICES

Instructional Approach /Practice	Percentage of Educators who use the method	
	Daily	Once a week
Direct Instruction	68.3%	24.7%
Note-taking	65.3%	25.7%
Problem-solving	2.3%	8.7%
Learner-designed instruction	0.7%	3.3%
Reciprocal teaching	0%	0%
Encouraging self-questioning learners	.33%	3.33%
Modelling of self-questioning by educators	1.3%	1.6%

Educator preferences to instructional approaches and practices (Table 29) reveal a focus on teacher-centred teaching, direct instruction without the use of alternative methods and note giving sessions that are teacher-dominated. Teacher-centred methods do not promote the development of metacognition in learners. Educators do not appreciate the use of resources to activate learner thinking or to stimulate learners in the teaching-learning process.

4.3.7.3 Classroom Designs

The majority of educators show a preference for the rows-of-desks classroom design that is aligned to teacher-centred, whole class teaching. This design is not suitable for collaborative learning that is envisaged in metacognitive classrooms.

4.3.7.4 Assessment Strategies and Techniques

The findings on assessment techniques reveal that educators in the sample do not value the inclusion of learners in the assessment process. Assessment is teacher-centred. Learners are not given a chance to take responsibility for self-evaluation and the evaluation of peers. Assessment techniques used by most educators are not

likely to facilitate the development of self-monitoring and self-regulation which have been identified as important in developing metacognitive abilities in learners.

The next chapter is a detailed discussion on each component of metacognition that was investigated in the study. Recommendations and suggestions for further research are included in line with the findings of this study.

CHAPTER FIVE

5.0 DISCUSSION AND RECOMMENDATIONS

The study attempts to identify teaching approaches, techniques and practices that could be considered useful in eliciting metacognition in learners. Secondly, the study seeks to ascertain the extent to which the practice of educators reflects the use of teaching strategies and techniques that are likely to foster the development of metacognition in learners. This chapter presents a discussion on the main findings provided in Chapter four.

5.1 EXPERIMENTAL RESEARCH: BRIEF OVERVIEW

The experimental research methodology used was designed to test the effectiveness of teaching strategies that have been identified as useful in facilitating the development of metacognition in learners. The results of the experiment showed a significant improvement in the performance of learners who were given metacognitive training sessions (see Table 4). These results reflected the effectiveness of such strategies in improving the summarisation skills of learners. The results support the findings of studies conducted in the area of metacognition and education in South Africa (Mahuma: 1996, Masureik-berger: 1995, Topham: 1992,). Although these studies had their own specific areas of focus on metacognitive teaching strategies, there is general consensus that metacognition has a positive influence on the academic achievement of learners.

5.2 NON-EXPERIMENTAL RESEARCH

The main purpose of the non-experimental research methodology - questionnaires, interviews and lesson class observation was to measure to what extent educators use teaching strategies that are likely to develop autonomous, self-regulated learners who are capable of metacognition.

5.2.1 Brief Overview: Strategies and Practices Identified as Useful in Developing Metacognition In the Literature Review of the Study

5.2.1.1 Collaborative Learner-centred classrooms:

In the context of this study learner-centred classrooms are those in which learners are actively involved in their own learning. In other words, they share the teachers' responsibility in taking care of their own learning. They share the decision-making processes. The learners are involved in each element in the curriculum process: planning (outcomes of learning), goals, implementation (methodology, teaching strategies and learning activities and evaluation). Learning environments that are collaborative and learner-centred are characterised by the following:

***Learners are given opportunities for planning**

The educator is responsible for making planning decisions for instruction. However, in order to develop and empower learners to be self-directed, self-regulated and autonomous, the educator needs to create opportunities where learners get practice in planning skills. This includes goal setting and monitoring the process towards the achievement of these goals.

***Learning is a collaborative effort between the educator and learner**

Learning is a team-effort between the educator and learners. The educator acts as a guide - a role that incorporates mediation, modelling and coaching.

***Groupings for instruction reflect the collaborative, interactive approach**

Apart from whole class teaching, the educator makes use of collaborative groupings like small groups and pairs.

***Classroom designs also reflect the collaborative philosophy**

Apart from the use of rows in classrooms, educators should make an effort to change the rigid design (which aligns itself to teacher-talk and questioning and passive learners) to small group designs, half-circles or the use of a variety of areas

in the classroom.

***Teaching strategies and techniques that are vital for developing metacognition**

- Limited use of teacher-talk and lecture methods
- Limited role of note taking lessons
- Use of direct instruction must work alongside with learner-centred methods
- Learner-centred strategies that involve active learner participation like reciprocal teaching, discovery and problem solving, activity based learning should be used with greater frequency.

***Learners receive practice in self questioning**

Educators should model self-questioning. This is a valuable tool for developing self-monitoring and self-regulation skills.

***Assessment: Learners engage in self assessment and peer assessment**

Learners should play an active role in the assessment of their own learning and their peers. The role of learner self-assessment and peer assessment in facilitating the development of metacognition in learners should not be underestimated. Even at a low level, learners are given a chance to look and introspect on issues concerning self and ability to manage learning tasks without the judgement of the educator. When used together with teacher evaluation, learners obtain an opportunity to develop introspection about one's performance.

The following section is a discussion of each metacognitive aspect investigated in the study:

5.2.2 Planning and Self-regulation

In the school curriculum planning decisions remain the responsibility of the educator. The educator takes care of the goals of instruction, the implementation and the evaluation processes. Quite understandably, the instruction appears to be educator

driven because in most cases, the educator has the knowledge and expertise to handle these processes. However, learners need opportunities in instruction where they develop skills on setting goals and monitoring the processes towards the achievement of these goals.

Learners require opportunities to refine decision-making skills. One way of achieving this objective is to create opportunities where learners are involved in planning and decision-making. This could be done from a simple to a more advanced level. For instance, learners can identify and select problem areas in a learning area, work out goals on what to do about the problems identified and also plan processes for implementation and time frames. This kind of practice creates a sense of responsibility in the learner. By making critically informed decisions about what he/she needs to learn and how he/she could go about it and in what period of time the learner develops responsibility and independence in learning. He/she learns to direct and monitor his own learning, even though it is in a limited sense.

Results on planning indicate that about half of the respondents in the sample, fifty-two percent (52%) never involve learners in any planning activity (see Table 17). These results show that educators are not developing metacognitive abilities like planning and self-regulation in learners.

If one analyzes the attempt to develop independent, self-regulated learners in Outcomes-based Education in South Africa, one realises that this will not be achieved if educators cling to and glorify traditional, authority based teaching practices and strategies. Learners will not automatically learn to manage and be responsible for their own learning if they are not trained to do so. To use a simple analogy, a parent who wishes to train his/her child to be independent and responsible in handling his/her own finances will teach the child budgeting skills and give the child some autonomy in handling pocket money. The child has to learn to manage his/her finances by receiving opportunities to independently plan and monitor activities around the use of money. He/she has to engage in self-assessment and self-correction in monitoring the use of money. If the parent completely controls the child

in the use of money while training him/her in self-management, it is highly unlikely that such a child would gain any skill from this training. It is quite imperative that educators should recognize that learners will become responsible for their own learning only if they are given opportunities to engage in planning and decision-making processes.

5.2.3 THE USE OF GROUPS IN INSTRUCTION

Contemporary thought on classroom interaction advocates the use of learner-centred, collaborative classrooms (Tudor: 1996). Educators have a variety of classroom groupings that could be used for instruction namely; whole class groups, small groups, pairs and individual work. Effective communication and collaboration are essential to becoming a successful learner. It is primarily through dialogue and examining different perspectives that learners develop to become knowledgeable, strategic and self-determined. Collaborative learning affords learners enormous advantages not available from more traditional instruction because a group can accomplish meaningful learning and solve problems better than individual alone (North Central Regional Education Laboratory: 1995).

The groups used in the class can either align themselves to the traditional classroom where the teacher is the information giver and learners are passive recipients, or the contemporary collaborative classroom where there is shared knowledge with the educator acting as the facilitator of the learning process. The daily use of whole class teaching, suggests traditional, teacher-centred methods. Educators should be versatile enough to use a variety of groupings from whole class teaching to small groups, pairs and individual work.

An analysis of the results obtained on whole class teaching are a direct contrast to those obtained on small groups and pairs. Seventy-nine point six percent (79.6%) of the educators use whole class teaching daily. Seventeen percent (17%) use whole class lessons once a week, one point three percent (1.3%) use this form of grouping once a month (see Table 10). Whole class teaching is a strong feature of the

classroom practice of educators. This is a strong suggestion that educators in the North West Province of South Africa are still adopting the role of educator as information giver. They have not internalised the paradigm shift that is required to move from traditional, teacher-centred approaches to collaborative, learner-centred classrooms. Interviews revealed that educators feel that the large class sizes prevented them from trying out other forms of groupings in instruction.

5.2.4 **CLASSROOM DESIGNS**

Collaborative classrooms have designs that facilitate communication and interaction among learners together with the educator. Seating patterns can facilitate or stifle the collaborative efforts of the educator. Flexibility and versatility in instructional approaches and patterns are a feature of contemporary instruction. Seating patterns adopted by educators should reflect variation according to the outcomes of instructions and learning activities. This suggests that ideally, the versatile classroom practitioner is likely to bring about a variety of seating arrangements in classroom instruction. Learners are not permanently exposed to the same seating pattern every single day.

Results obtained on the use of clusters of desks or small group arrangement indicated that only seven point three percent use clusters of desks daily, fourteen percent (14%) use these clusters once a week, forty-six point six percent (46.6%) use this arrangement once per fortnight, twenty-one point three percent (21.3%) use it once a month and ten point sixty seven percent (10.67%) never use clusters of desks at all in their teaching (see Table 23).

The use of a variety of areas in the classroom is an unpopular or unknown concept for most of the educators. Seventy-four point three percent (74.3%) never use this form of arrangement (see Table 24).

In order for educators to create a rich learning context to develop self-directed learners they must essentially provide opportunities for collaborative work and

problem solving. Educators need to pay attention to the physical environment. There are certain seating arrangements that promote collaborative work and communication and others that stifle this effort. There are times when the educator has to move desks so that all learners maintain a face-to-face arrangement and this setting promotes true discussion. An arrangement where learners are always exposed to rows of desks stifles interaction and discussion, and promotes a one-way, teacher to learners authoritarian approach.

Rows of desks are necessary for certain kinds of outcomes. Learners must experience different designs for stimulus variation. In most classrooms, desks are not permanently fixed. They can be moved to follow any design. The groupings used by educators and the classroom designs or seating arrangements reflect a consistent pattern: that educators in the North West Province of South Africa have not moved away from an instructional chalk and talk traditional pattern of instruction.

5.2.5 INSTRUCTIONAL APPROACHES AND PRACTICES

5.2.5.1 Problem Based Instruction

Metacognition guides problem-solving processes and improves the efficiency of the goal-directed process in problem solving (Metcalfe and Shimamura: 1994). In other words if learners are engaged in problem-solving processes this activity facilitates the development of metacognition.

The processes involved in problem-solving help the learner to become goal-directed. These processes involve identifying and defining the problem, planning how to proceed and engaging in problem solution evaluation. In the classroom, problem-solving progresses from a simple to more complex levels depending on the outcomes of the educator as Arends (1997) correctly puts it. Problem-based learning engages students in self-directed investigations that help learners to interpret and explain real world phenomena and construct their own view and understanding about these phenomena (Arends: 1997).

Respondents in the study were asked to indicate the frequency with which they used problem-based instruction in their practice of teaching. Responses obtained from the interviews revealed that the majority of educators are not confident to execute this type of teaching strategy. They are not fully conversant with the purpose of this strategy and the processes or steps to be followed in it. A number of respondents also indicated in the interviews that they found the numbers of learners in large classes prohibitive in the use of learner-centred strategies like problem-solving.

5.2.5.2 Reciprocal Teaching Strategies

Reciprocal teaching is an important tool for developing self-directed, self-regulated learners. It requires the educator to make use of modelling and facilitation to develop important cognitive skills. Learners are normally taught four specific self-regulated comprehension strategies: summarising, asking questions, clarifying and predicting. The educator makes use of small groups and helps each group to read an assigned passage. He/she then models the four skills - summarising the passage, asking questions, clarifying difficult sections and predicting the movement of the story. One learner from the group is given a chance to assume the educator's role and to serve as discussion leader for the group. The educator then assumes the role of a facilitator, mediator and coach. The educator gives each learner an opportunity to take responsibility for learning. They become more and more confident in directing learning and the learning of other learners.

Results obtained from this study indicate that reciprocal teaching is an unknown concept for most of the educators. It was quite clear that educators appear to be making use of the more traditional methods like note-taking not only because of their beliefs and philosophies of teaching, but because of a lack of exposure to modern thought and trends on contemporary teaching strategies.

5.2.5.3 Direct Instruction

Direct instruction is mainly a teacher-centred form of instruction that is useful for

teaching basic skills and facts. It is vital in introducing new concepts or helping learners in learning tasks that acquire tackling in a step-by-step fashion. When it is used together with learner-centred approaches in a lesson it is a useful tool for directing learning. However, there are situations where educators use it exclusively in instruction, excluding other teaching strategies. In that kind of set up, learning becomes teacher dominated and controlled. Learners assume less and less responsibility for learning and are therefore unlikely to develop into self-directed, autonomous learners. They become dependent on the educator to direct the learning process and their learning.

When educators were asked to indicate how often they used direct instruction in their teaching it turned out to be the most popular teaching practice used by educators. These results reveal that educators still maintain a traditional educator-centred teaching orientation that will not create independent, self-directed learners. If sixty-eight percent of the educators used in the sample are a reflection of education practice in South Africa, one realises that learning is still characterised by teacher chalk and talk plus other activities like note-taking that will not facilitate the development of self-directed, autonomous learners envisaged in Outcomes Based Education.

5.2.5.4 **Note-taking**

Note-taking activities proved to be the second most popular in the list of approaches and practices of teaching used by educators in the North West Province of South Africa.

Although note-taking is a vital activity that could lead to self-directed learning when used correctly, it can stifle self-regulation if the learner is asked to copy volumes of information from the chalkboard, information that has been written and not explained by the educator.

Note-taking can be vital in creating self-directed learners in a context where learners

are engaged in mainly note-making activities, summarising and independently working out main ideas and key facts from a body of information. In such a context they learn to separate vital from irrelevant material and key facts from minor facts. They learn to organise facts in a logical manner following the order of the given information. The educator helps the learners by guiding and facilitating the process. He or she does not deliver information wholesale to a passive learner. Unfortunately, it was observed that notes are written on the board for learners to copy and such note-taking activities take the duration of a whole lesson. In other words, the note-taking session replaces instruction.

When learners are subjected to a daily dosage of note-taking sessions, learning loses its meaning. Some learners become conditioned to passively receiving information without understanding or questioning it. They cannot become critical or independent thinkers. Educators need to be enlightened on the appropriate use of note-taking activities in instruction.

5.2.6 **LEARNER SELF-QUESTIONING**

Self-questioning plays an important role in helping learners become independent and self-regulated. In the execution of any learning task, it is vital for a learner to engage in self-interrogation and monitor his or her capabilities in task-achievement. When learners are encouraged to engage in self-questioning, they learn to monitor and regulate their learning. For instance, in reading tasks, a learner who asks himself or herself the following questions is likely to make progress by reflecting after reading: Questions such as, "Have I understood what I am reading? Did my reading make sense? Can I summarize the major points of my reading? Should I read the second paragraph again to enhance my understanding?" would lead to be a more autonomous handling of the reading exercise.

It is vital for educators who aim to develop autonomous self-regulated learners to encourage their learners to engage in self-questioning in the execution of learning tasks. Respondents were asked whether they encourage self-questioning in their

learners. Results showed that self-questioning is a concept that most educators do not consider as a vital skill to be developed in learners. In actual fact, most educators have not considered the value of self-questioning in developing a learner's capabilities in the teaching-learning situation. Results obtained on the aspect of encouraging learners to engage in self-questioning indicated that sixty-nine percent of the educators (69%) never encourage learners to engage in self-questioning, and twenty-two point seven (22.7%) encourage learners in this aspect once a month (see Table 18).

An analysis of these results indicates that educators need to be enlightened on the value of encouraging learners to engage in self-questioning. It is not only vital in creating critical thinkers but it also helps each learner to consciously monitor his or her progress. This helps the learner to progressively become more and more self-directed.

5.2.7 **MODELLING SELF-QUESTIONING**

Apart from encouraging learners to engage in self-questioning, it is vital for educators to show learners what self-questioning involves. In other words learners are not likely to get a picture of all the processes of self-questioning unless they see examples of the process. Therefore educators who instruct learners to engage in self-questioning must be prepared to model self-questioning. Educators have to think aloud to show this process.

When educators think aloud in working out some of the tasks in the classroom they are making overt their thought processes to their learners. This modelling makes learners realise that at times many people, including educators find it difficult to tackle learning tasks. Therefore, they have to use strategies like self-questioning to ensure a step-by-step approach to tackling a task.

Respondents in the sample were asked how often they model self-questioning in the classroom almost three quarters of the educators in the sample (72.67%) do not

model self-questioning (see Table 19).

These results indicate that possibly the failure of educators to model self-questioning might be an indicator that educators do not engage in the vital skill of self-questioning. It is also possible that the role of self-questioning in instruction is a new concept whose value educators have not yet come to appreciate. However, results obtained on educators' efforts in encouraging self-questioning in learners and modelling this aspect indicate that it is not an aspect that features in their practice of teaching. Learners therefore do not receive training in self-questioning, a skill that is vital in developing self-regulated learners.

5.2.8 ASSESSMENT STRATEGIES AND TECHNIQUES

5.2.8.1 SELF-ASSESSMENT

The use of self-assessment as part of the overall assessment of learners plays a key role in fostering the learners ability to assume an active and self-directed role in learning.

Self-assessment is vital in developing independent, self-regulated learners in a number of ways. Firstly it is vital in the promotion of learning. Learners can think critically about their competence in the performance of tasks. Learners do not rely solely on the judgement of the educators but are forced to adopt a more discerning attitude towards themselves and their performance.

5.2.8.1.1 The use of self-assessment by educators

Results obtained on the use of self-assessment reflect that sixty-one point thirty-seven percent (61.37%) of the educators in the sample never use self-assessment as an assessment technique in the evaluation of students. Thirty percent (30%) use self-assessment once a month (see Table 26).

Self-assessment is clearly not a feature of the current practice of educators. Most of them feel most reticent about transferring assessment responsibility to learners or

sharing assessment responsibility with them. This is an understandable reaction, bearing in mind that most educators in South Africa are products of a learning culture which had an authority based orientation. However, one realises that educators need orientation and training in the use of self-assessment and peer assessment alongside the more traditional forms of assessment such as teacher evaluation, which is a reflection of contemporary trends on instruction and assessment (Tudor: 1996).

Outcomes Based Education, introduced in South Africa in 1998, advocates learner-centred instruction. The ultimate goals of a learner-centred curriculum is learner empowerment. It enables learners to pursue learning goals in a self-directed, independent manner. Self-assessment plays a crucial role in promoting self-regulation, a feature of metacognition in learners. If educators do not recognise the value of including self-assessment in the forms of assessing they use to evaluate learners, learners lose a vital form of assessment that plays a pivotal role in learner empowerment.

5.2.8.2 **Peer Evaluation**

Peer evaluation is not educator centred and it provides learners an opportunity to evaluate their peers using the goals of learning. The rationale behind peer evaluation is that by reflecting critically on the abilities of other learners with respect to shared goals. Learners are involved in the assessment of chosen parameters which are relevant to their own performance. Therefore, peer evaluation becomes a form of self-assessment (Tudor: 1996).

An analysis of the results obtained on the use of self-evaluation and peer evaluation as forms of assessment reflects that the majority of educators have not integrated these forms of assessment into the kinds of assessment they use. Most of the educators still believe that assessment is the preserve of the educator. The following results obtained on the use of teacher-made tests are a reflection of this belief.

5.2.8.3 The use of Teacher-made Tests in Assessment

The results obtained on the use of teacher-made tests indicate that by and large, there are no changes in assessment strategies since the introduction of learner-centred evaluation like self-assessment and peer assessment in Outcomes-Based Education. Educators still believe that assessment should be teacher-centred and that learners do not possess the expertise to handle any form of assessment.

It is quite possible that educators still cling to traditional teacher-centred forms of assessment because they are comfortable with the known. Change means venturing into the unknown, and some times this calls for a move away from our comfort zone. It also requires an exercise in using initiative as you make adjustments and changes to what you have known before. It is also possible that educators lack knowledge and information on new forms of assessment that can be used in conjunction with teacher assessment to empower learners and help them to apply critical thinking skills.

5.2.9 CREATING RICH LEARNING ENVIRONMENTS: The Use of Resources

Effective instruction should include creating and managing a learning environment that will facilitate the development of learners. This requires creating a physical environment that is rich in sensory stimuli and a social environment in which learning goals are communicated clearly and forcefully to learners. A rich learning environment promotes independent and self-regulated learning. Stimulating charts, bulletin boards and displays spark curiosity and serve as motivators for independent inquiry (Arends: 1997).

5.2.9.1 Task-cards Create Task-oriented Learners

The results obtained on the use of task-cards and worksheets indicate that over half of the respondents, namely 60.33% do not use task-cards or worksheets in their teaching. Only thirty point sixty seven percent (30.67%) of the respondents use

worksheets at least once a month.

5.2.9.2 Charts

Results obtained on the use of charts reveal that 39% of the educators do not use charts in their practice of teaching. This is an indication that two-fifths of the educators in the sample do not use this vital resource to stimulate learner thinking in the classroom. About 36% of the educators in the sample use charts once a month. An overall analysis indicates that about 75.7% three-quarters of the educators in the sample use a chart once a month or never at all. Only 21% of the educators use charts once per fortnight and a minute 3% use charts once per week (see Table 21). Results obtained on the use of task-cards, charts and any other form of media suggest that educators have not developed an appreciation of the value of media in teaching.

The study noted a significant absence of rich learning environments in most classrooms. Educators do not provide a rich array of materials and supplies for learner use in lessons. Classrooms were bare, lacking in sensory stimuli that is crucial in prompting learner thinking and gaining learning attention within the lesson.

Among the reasons cited for the total lack of media within the classroom and lessons was the lack of finances in schools.

However, educators need to display initiative and resourcefulness by using low-cost items for teaching-learning aids. The total absence of media in most classrooms reflects that educators lack adequate knowledge on the value media in creating independent, self-regulated learners.

5.2.10 A NEW CHALLENGE FOR EDUCATORS: Creating Collaborative Learner-centred Classrooms

Results obtained on the practice of educators show that even if reform in education

was introduced in South Africa in 1998, in the form of Outcomes Based Education, the practice in schools in the North West Province schools remains the same. Instructional approaches and practices remain educator - dominated with chalk and talk methods and note-taking occupying much of instruction time. The reasons given for the use of these methods are normally the large class sizes and the lack of resources. True, educators cannot use small groups and other innovative methods in these large classes. But the answer does not lie in giving notes to these learners daily. The answer might lie in interspacing whole class approaches with occasional once a week small group strategies. It is quite possible that small groups might be difficult to handle in large classes, but the use of pairs is possible in any class, small or large. This research has shown that even in small classes educators in the North West Province of South Africa still use teacher-dominated methods. A close analysis of these facts reveals one fact, the attitudes of educators towards reform show that change has not been embraced. Educators still use didactic approaches discussed in Topham's study (1992), and in Macdonald (1990).

5.3 RECOMMENDATIONS

This research has shown that although three years have gone by since reform in education was introduced in South Africa, educators in the North West Province of South Africa still cling to traditional teacher-centred methods of teaching, traditional classroom groupings, designs and assessment methods. This is a clear indication that the desired change towards learner-centred instruction has not taken root. A number of valid reasons have been put forward for this scenario. They include the following:

* **Lack of resources**: Schools in disadvantaged communities cannot afford the kind of resources required in learner-centred classrooms.

* **Inadequate Training of Educators on the new curriculum**.

* **Class sizes**: Large classes cannot be managed adequately when educators use learner-centred instruction.

The following recommendations are therefore made on the basis of the findings of this study:

5.3.1 COMPREHENSIVE PROJECTS ON EDUCATOR TRAINING

The Department of Education in the North West Province has made efforts to provide short workshops on Outcomes Based Education for selected educators. Such educators have been asked to train their peers. One realises that this kind of training has not been effective.

* **Each educator in the field should receive training in learner-centred strategies of teaching.**

* **Ultimately all educators should have the opportunity to attend training**

courses in collaborative teaching and learner-centred classrooms.

The kind of training envisaged here is not the provision of a one-day or two-day workshops but an adequate short course that would give effective grounding in learner-centred instruction.

* The focus of such training should be an **attempt to change attitudes and perceptions of educators towards learner-centred instruction.** The findings of this research suggest that change in instructional strategies and techniques will not be experienced until educators go through a change in attitudes and perceptions. This calls for a shift in their mindset which would usher in desirable attitudes like flexibility or versatility, willingness to change and willingness to learn. Current attitudes indicate a total lack of initiative and the desire to try something new. Problems are highlighted each time change is suggested and these problems cloud any effort to train the educators.

5.3.2 PROVISION OF ON-GOING TRAINING AND SUPPORT TO EDUCATORS

* If training is provided in the form of a short course or workshops, it must be supplemented by on-going training and support when educators return to school. There must be a good monitoring programme to give educators encouragement and on-going support in their attempts to try out new strategies of teaching.

5.3.3 WORKSHOPS ON METACOGNITIVE TEACHING STRATEGIES

* Apart from training on collaborative teaching and learner-centred classrooms, educators need strategies and techniques on reducing learner dependence on educators. In other words, educators need to teach with a conscious awareness of **metacognitive teaching strategies**. If the education system is supposed to create critical thinkers who are capable of self-direction and self-regulation, it is necessary for educators to be fully conversant with all aspects

surrounding the creation of an independent, autonomous learner who does not rely solely on the educator to deliver knowledge and information.

5.3.4 REDUCTION OF CLASS SIZES

* Class sizes and the educator-pupil ratio in schools around the country should accommodate the use of collaborative, learner-centred strategies.

Although the issue of class sizes has been an on-going debate for a while, at a more practical level, nothing has been done to reduce large classes that hamper the use of any kind of teaching strategy. If collaborative, learner-centred classrooms are to be created it is imperative that the Department of Education makes an effort to reduce class sizes to acceptable levels.

5.3.5 A NATIONAL HOLISTIC APPROACH TOWARDS THE PROFESSIONAL DEVELOPMENT OF EDUCATORS

* All stakeholders in educator-training and educator training institutions namely universities, colleges and technikons should convene a National Forum to work out a national holistic programme on the **professional development of educators.** Such a forum would address educator competence and acceptable standards of operation in schools, and ways of evaluating educator competence. The findings resulting from this investigation seem to place educator competence (at the basic level of competence in the delivery of instruction) in a questionable light. Most educators are not satisfactorily equipped to handle classrooms instruction. **Useful instruments for assessing educator competence and training needs should be drawn up**.

5.4 SUGGESTIONS FOR FURTHER RESEARCH

5.4.1 RESEARCH ON EDUCATOR ATTITUDES TOWARDS METACOGNITIVE INSTRUCTION

This study, has shown that educators are not using learner-centred strategies envisaged in Outcomes Based Education, methods that are supported by contemporary thought on classroom instruction. **There are reasons behind the reluctance to use learner-centred methods, or the negative attitudes towards such effective methods of instruction. These reasons should be identified through research as the next step towards working out training programmes for educators**. Any kind of training on instructional techniques that does not have the support of the educator is futile and a waste of resources.

5.4.2 RESEARCH ON USEFUL INSTRUMENTS TO TEST EDUCATOR COMPETENCE IN LEARNER-CENTRED INSTRUCTION

* Research is also required in the area of testing educator competence. This kind of research should develop an effective tool to test educators. It should also establish whether educators have the knowledge, skills, attitudes and expertise to effectively deliver programmes of instruction at certain levels of learning. It should be qualitatively different from the current educator appraisal tool used by the Department of Education. The kind of tool envisaged here is one geared towards the assessment of training needs.

5.4.3 RESEARCH ON LEARNER ATTITUDES TOWARDS METACOGNITIVE LEARNER-CENTRED INSTRUCTION

Research should be conducted on learner attitudes and receptivity to learner-centred instruction. It is quite possible that efforts towards changing teacher attitudes towards learner-centred instruction might be undermined by negative learner attitudes towards such instruction.

5.5 CONCLUSION

The education system in South Africa is likely to achieve a successful transformation towards learner-centred instruction if concrete steps are taken to improve the quality of teaching and learning. Such efforts should include programmes aimed at improving educator competence. Competent, reflective, broadminded educators created through these training programmes would possess adequate skills to handle metacognitive, learner-centred methods of instruction that are effective in producing independent, self-regulated learners.

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APPENDIX A

QUESTIONNAIRE: Educators

The aim of this questionnaire is

i. to establish educators' philosophies and beliefs on the practice of teaching.

NB: The information you give in this questionnaire will be treated in the strictest confidence.

Kindly complete this questionnaire by ticking (✓) in the appropriate block and giving information where required.

A. School Particulars

1. Location of School

1. Rural	
2. Urban	
3. Peri-urban	

2. School Circuit _____

3. District _____

4. School (Phase) Type:

Primary	Middle	High

5. Gender

1. Male	
2. Female	

6. Marital Status

1. Married	
2. Single	
3. Divorced	
4. Widowed	
5. Other (specify)	

7. Academic Qualifications

1. Below Std 10	
2. Std 10	
3. Junior Degree	
4. Honours Degree	
5. Masters Degree	
6. Above Masters Degree	

8. Professional Qualifications

1. Untrained	
2. Primary Teacher's Course	
3. Secondary Teacher's Course	
4. University Degree	
5. University Diploma	
6. Other (please specify)	

9. What is your position in the school?

1. Principal	
2. Deputy Principal	
3. Head of Department	
4. Teacher	

10. Your age category

1.Below 30 yrs	
2. 30 - 40	
3. Above 40	

11. Teaching Experience

1. 0 - 5 years	
2. 6 -10 years	
3. 11 - 15 years	
4. 16 - 20 years	
5. Above 20 years	

B. 12.Teaching Style Inventory

How often do you use each of the following techniques?

	Never	Rarely (Once a month)	Occasionally (Once in 2 weeks)	Frequently (Once a week)	Always (Everyday)
a. Whole class lessons					
b. Small group assignments					
c. Task-cards or worksheets					
d. Role-playing/ Games					
e. Peer tutoring					
f. Brainstorming					
g. Students design their own studies					
h. Students lead the class in discussions					
i. Note-taking					
j. Media - based teaching					

13. Which statement best describes you as a teacher?

	Never	Rarely	Occasionally	Frequently	Always
a. How often do you follow your lesson plan closely?					
b. You are flexible and active					
c. How often do you concentrate mainly on achievement of outcomes?					
d. Interested in lesson activities					
e. Interested in the learner's ability					

14. Which of the following educational approaches and concepts do you use in your lessons?

	Never	Rarely	Occasionally	Frequently	Always
a. Direct Instruction					
b. Reciprocal Learning					
c. Discovery					
d. Project work					
e. Independent study					
f. Giving explanations					
g. Activity based learning					
h. Problem-solving					
i. Lecturing					
j. Individual assignments					
k. Question and answer sessions					
l. Teacher explanations plus questions					

15. To what extent do you agree with each of the following statements.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
a. I am concerned with How students learn					
b. I am concerned with What student learn					
c. I evaluate students as they work.					
d. I evaluate students at the end of the task					

16. I believe that teaching becomes effective when I

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
a. Use one teaching method					
b. Use two teaching methods					
c. Use a variety of teaching methods					

17. How often do you use each of the following evaluation techniques?

	Never	Rarely	Occasionally	Frequently	Always
a. Observation by moving from group to group.					
b. Observation by moving from individual to individual.					
c. Teacher made tests.					
d. Student self-assessment tests.					
e. Peer evaluation					

18. How often do you ask learners to do the following?

	Never	Rarely	Occasionally	Frequently	Always
a. To ask themselves questions (self-questioning) as they work.					
b. To ask you (the teacher), questions as they work.					
c. To ask other learners questions as they work.					

19. For each lesson that you teach do you inform your learners about the goals of that lesson?

Never	Rarely	Occasionally	Frequently	Always

20. How often do you use each of the following resources/approaches in class?

	Never	Rarely	Occasionally	Frequently	Always
a. Bulletin board					
b. Student displays of good work					
c. Use of charts					
d. Providing learners with the day's newspaper					

21. How often do you use each of the following groupings?

	Never	Rarely	Occasionally	Frequently	Always
a. Several small groups (3-8 students)					
b. Pairs (2 students)					
c. Independent study (student each works alone)					
d. One-to-one interactions with the teacher					
e. One large group (the whole class)					

22. How often do you use each of the following classroom designs?

	Never	Rarely	Occasionally	Frequently	Always
a. Rows of desks					
b. Small groups					
c. Half-circle (whole class)					
d. A variety of areas					

23. Which of the following practices do you carry out in your day-to-day practice of teaching?

	Never	Rarely	Occasionally	Frequently	Always
a. To reflect on different methods of teaching before the lesson.					
b. To think about your teaching during the lesson.					
c. To change methods during the lesson.					
d. To follow the lesson plan systematically to the end.					
e. To note and act on problems as they occur in the lesson.					
f. To note and act on problems after they have occurred in the lesson.					
g. To think aloud during the lesson.					
h. To encourage learners to verbalise their thoughts.					

APPENDIX B

INTERVIEW QUESTIONS

1. **Teaching Techniques**

a. Direct Instruction
b. Reciprocal Learning
c. Discovery Methods
d. Problem Solving
e. Project Work
f. Activity Based Teaching
g. Question and Answer Sessions
h. Chalk and Talk Session
i. Discussion

Questions

Consider each of the above techniques

(a) Explain your understanding of the teaching strategy
(b) Do you believe that it is of any importance in the teaching-learning situation?
(c) How often do you use it, (if at all)?
(d) Are there any problems or difficulties that you encounter whenever you use it?

2. Do you consider it important that learners should be able to work independently?

   Why or Why not?

3. In your lessons, do you give each learner opportunities for

   (a) independent study
   (b) individual assignments
   (c) leading peers in discussions

4. Which grouping do you find most convenient to use in your lessons?

   (a) whole-class lessons
   (b) small group lessons (3-8 learners)
   (c) individual work (one learner)
   (d) Give reasons for your choice

5. How often, (if at all) do you use the following procedures or activities in your lessons?

   (a) brainstorming
   (b) peer tutoring
   (c) role playing
   (d) learners design their own studies
   (e) note-taking
   (f) media lessons - films/video tapes
   (g) task-cards
   (h) games

6. In your opinion, do you think teaching is effective when -

   a. you use one teaching method for the lesson?
   b. you use two teaching methods for the lesson?
   c. you use a variety of teaching methods for the lesson?

7. Do you believe that teachers should -

   a. monitor learners as they work?
   b. give learners opportunities for independent work?
   c. evaluate learners as they work?
   d. evaluate learners at the end of each task?

8. Do you consider the use of the following resources useful in your lessons/schools?

   a. bulletin boards
   b. student work displays
   c. charts
   d. newspapers / magazines

9. Is your school well-provided for in terms of prescribed books, supplementary books, library books?

10. Do you think it is useful for a teacher to make learners aware of the outcomes/goals of the lesson?

11. How often, (if at all) do you engage in the following activities?

   a. To think about your lesson before the lesson?
      To think about your lesson during the lesson?
      To think about your lesson after the lesson?

   b. To evaluate yourself and your abilities

      before
      during

after
the lesson

c. To follow the lesson plan systematically to the end

d. To teach learners study methods

e. To teach learning strategies

f. To change planned activities in the lesson because of circumstances

APPENDIX C

CLASSROOM AND LESSON OBSERVATION SCHEDULE

METACOGNITIVE ENVIRONMENT CHECKLIST

A. PROVISION OF RESOURCES TO STIMULATE METACOGNITIVE ABILITY

	Inadequate	Satisfactory	Adequate
1. Library			
2. Prescribed Books			
3. Supplementary Books			
4. Newspapers			
5. Magazines			
6. Task Cards			
7. Games			
8. Computers			
9. Other Resource Material			

B. CLASSROOM DESIGN

	Inadequate	Satisfactory	Adequate
10. Mental Stimuli Objects			
11. Student Work Displays			
12. Charts			
13. Bulletin Boards			
14. Rows of Desks			
15. Groups			

C. THE PRACTICE OF TEACHING

	Inadequate	Satisfactory	Adequate
16. Prescriptive			
17. Chalk and Talk			
18. Problem Solving			
19. Research/Project Work			
20. Group Activity			
21. Individual Activity			
22. Activity Based Teaching			
23. Discovery			
24. Discussion			
25. Direct Instruction			
26. Reciprocal Teaching			
27. Opportunities for Self-evaluation			
28. Self-questioning			
29. Versatile, Flexible Approach			
30. Student Planning			
31. Student Self-regulation			
32. Clear Common Goals			
33. Variety of Teaching Strategies			
34. Modelling of Reflective Behaviour			
35. Dialogue			
36. Collaborative Activity			
37. Challenging, Stimulating			
38. Learning Environment			
39. Effective Monitoring of Learning			
40. Teacher Evaluation			
41. Teacher Facilitation Skills			

	Inadequate	Satisfactory	Adequate
42. Continuous Assessment			
43. Teaching Materials/Creativity			
44. Facilitation Skills (Tr)			
45. Questioning Skills			
46. Decision-making skills			
47. Concern for Student Learning			
48. Opportunities for Learners to apply knowledge			
49. Learners awareness of goals/outcomes of learning			
50. Purposeful Classroom Activities			

Key:

1. Inadequate
2. Satisfactory
3. Adequate

APPENDIX D

THE TEACHING OF SUMMARISATION SKILLS TO ENGLISH SECOND LANGUAGE HIGHER GRADE LEARNERS

Useful Procedures

1. First Phase: Explicit Direct Instruction by the educator on summarisation.

Useful Questions

a. What is a summary?
b. Procedures involved in summarisation?

[Learners are asked to think about and list strategies they would use to come up with a short version of a story]

c. Summary questions

d. Meaningful reading and comprehension of the passage to be summarised

[Opportunities for (1). loud reading and (2) silent reading (for comprehension)]

2. Second Phase: Metacognitive Training

Training on how to monitor and control rules on summarisation

2.1 Training on self-questioning in the accomplishment of tasks e.g. selection of key ideas.

2.2 Modelling of self-question by educator.

2.3 Collaborative activities

- Pairs - comparing key ideas selected or
- Groups - deletion of trivia or redundant material
- Whole class activity - Educator plus learners

2.4 Coaching/Mediation (Individual tasks)

- Helping learners to assess on-going performance. Training on self-monitoring and self-regulation.

- Reducing the number of words if necessary

- Substituting superordinate terms with one term
- Checking completeness of sentences of the format - to point form

- Writing the number of words used in brackets at the end of the summary.

3. **The Third Phase**

Writing the final draft of the summary.

Each learner writes the final draft of the summary.

APPENDIX E

SUMMARY 1

(Spend about 20 minutes on this question)

Read the passage below, then in no more than 50 words, summarise the points that you should consider when buying on credit. Answer in prose or point form. Full sentences must be used. Count the number of words used and write the number in the space provided.

SPENDING WISELY ON CREDIT

Credit has transformed the consumer world. You can have what you want immediately and pay for it later. Properly used, credit is a great invention. Abused, it can become an absolute nightmare.

When buying on credit, shop around for the best value. Compare prices, interest rates, guarantees and other benefits, so that you can be sure you're getting the best deal available. Work out how much more you'll be paying. With a few exceptions, buying on credit is always more expensive than buying for cash. The interest or finance charges can add enormously to the final bill, so it might be worth waiting and paying the full amount in cash. Or consider a lay-buy, which is not a credit transaction as such. Ask yourself: can I really afford it? When buying an item on instalment, you must be absolutely sure that you can keep up your repayments. If not, you run the risk of losing the item you've bought as well as some or all of the money you've paid.

Make sure you read and understand everything in the contract before signing. Don't sign documents until all blank spaces have been filled in. This may seem obvious, but once your signature is on a contract it is binding, so make sure you know what you are signing. Keep a copy of the contract. Insist on written receipt for every payment you make, and keep these in a safe place. In the event of a dispute, this will enable you to prove what you have agreed to and what you've already paid. To avoid extra interest being added

to your bill, pay on time. If you find you can't make a payment, take action. Don't just wait for repossession or allow yourself to get deeper into debt, rather contact your creditor immediately and try to arrange for more time to pay.

SUMMARY II

(Spend about twenty minutes on this question)

Read the passage below, then in 50-55 words summarise the main ADVANTAGES mentioned by the writer of mothers who have young children, going out to work. Indicate the number of words you have used.

SHOULD MARRIED MOTHERS WITH YOUNG CHILDREN SEEK EMPLOYMENT?

This is often the cause of family arguments, with husbands and wives arguing for and against working mothers - working outside the home, that is.

There are undoubtedly many advantages to a second salary being brought home every month. The family can often afford many extras such as household equipment, a car and better food, as well as saving for their offsprings further education. Unfortunately, a working mother incurs additional expenses - travel money, a day-care centre if the children are very young, and often a household helper has to be employed. But money is not the only consideration. Children attending a nursery school will have more companions to play with and often more communal toys. They will probably develop more independence away from their mothers' apron strings. Conversely, some people find it pathetic to see young babies being delivered to "day mothers" from the very beginning; or to see young children with mothers too tired to cook ã decent meal or pay them any attention. The so-called "quality time" is often non-existent. It has also been argued that fathers take more part in the upbringing of their children if their mother works. Perhaps!

Career women point out that they have as much right to a career as their husbands. They want to "succeed" too, not only for the money but for their self-image. But there are sacrifices to be made in such cases; mothers miss a great deal of their children's early development which can give so much pleasure.

"But what will teenagers think of a mother who can do nothing but clean and cook? Will such mothers earn respect?"

Well, I suppose it depends on individual circumstances. Perhaps we should follow the Americans and call housewives "Household Executives" to make people see that it is a responsible position! Perhaps also, compromise is needed especially for mothers of very young children. Employers should put more part-time jobs on offer so that women can have the best of both worlds.

A[1]

APPENDIX F

EXPERIMENTAL RESEARCH SCORES - GROUP X : EXPERIMENTAL GROUP

STUDENT SCORES

	Pretest Scores Group X	Posttest Scores Group X
1	10	13
2	11	11
3	13	12
4	6	12
5	10	12
6	6	13
7	8	13
8	10	10
9	12	7
10	9	11
11	8	13
12	11	12
13	9	12
14	10	14
15	10	11
16	5	13
17	5	14
18	3	12
19	7	11
20	10	11
21	7	11
22	10	12
23	5	14
24	7	14
25	10	14
26	10	13

	Pretest Scores Group X	Posttest Scores Group X
27	10	12
28	11	13
29	8	13
30	8	12
31	7	11
32	7	13
33	8	12
34	9	9
35	11	12
36	9	3
37	7	13
38	7	11
39	6	11
40	7	12

A^2

EXPERIMENTAL RESEARCH SCORES - GROUP Y : CONTROL GROUP STUDENT SCORES

	Pretest Scores Group Y	Posttest Scores Group Y
1	12	6
2	8	5
3	3	10
4	11	7
5	5	2
6	12	3
7	6	4
8	5	5
9	6	7
10	6	5
11	5	7
12	6	6
13	5	7
14	5	4
15	10	6
16	12	4
17	9	2
18	7	3
19	8	4
20	8	7
21	8	5
22	5	5
23	7	6
24	12	7

	Pretest Scores Group Y	Posttest Scores Group Y
25	8	8
26	8	8
27	8	5
28	6	8
29	10	11
30	8	10
31	7	8
32	9	9
33	9	8
34	8	7
35	7	8
36	9	10
37	10	8
38	9	8
39	8	9
40	7	8

B[1]

EXPERIMENTAL RESEARCH SCORES - GROUP X : EXPERIMENTAL GROUP

STUDENT SCORES

	Pretest Scores Group X	Posttest Scores Group X
1	7	11
2	8	10
3	10	11
4	8	10
5	9	7
6	12	13
7	6	14
8	6	12
9	6	12
10	8	13
11	6	10
12	7	10
13	7	10
14	5	10
15	4	11
16	6	11
17	6	12
18	5	13
19	10	12
20	9	11
21	8	10
22	8	11
23	9	11
24	10	11
25	11	11
26	18	9
27	6	8

	Pretest Scores Group X	Posttest Scores Group X
28	6	10
29	5	10
30	7	10
31	7	12
32	8	11
33	9	12
34	7	13
35	6	12
36	7	10
37	6	9
38	9	9
39	10	11
40	9	12

B^2

EXPERIMENTAL RESEARCH SCORES - GROUP Y : CONTROL GROUP

STUDENT SCORES

	Pretest Scores Group Y	Posttest Scores Group Y
1	8	8
2	6	6
3	10	5
4	6	5
5	6	10
6	5	10
7	10	7
8	6	7
9	5	9
10	8	7
11	8	6
12	6	6
13	6	9
14	8	11
15	10	9
16	4	10
17	10	8
18	10	7
19	8	8
20	9	8
21	7	7
22	7	10
23	7	8
24	5	9

	Pretest Scores Group Y	Posttest Scores Group Y
25	4	7
26	7	7
27	4	7
28	7	10
29	4	6
30	5	5
31	6	4
32	9	7
33	9	7
34	8	9
35	7	8
36	10	7
37	9	8
38	8	4
39	7	5
40	8	5

C¹

EXPERIMENTAL RESEARCH SCORES - GROUP X : EXPERIMENTAL GROUP

STUDENTS SCORES

	Pretest Scores Group X	Posttest Scores Group X
1	5	8
2	11	11
3	8	12
4	5	9
5	6	9
6	8	11
7	11	12
8	5	8
9	7	12
10	10	11
11	11	11
12	9	12
13	8	8
14	7	9
15	5	12
16	9	11
17	10	8
18	8	10
19	7	8
20	10	12
21	11	13
22	9	12
23	8	11

	Pretest Scores Group X	Posttest Scores Group X
24	9	8
25	9	14
26	5	9
27	7	8
28	8	11
29	9	13
30	7	8
31	8	11
32	9	10
33	7	13
34	10	14
35	11	13
36	10	10
37	8	9
38	7	9
39	7	10
40	6	11

C^2

EXPERIMENTAL RESEARCH SCORES - GROUP Y : CONTROL GROUP

STUDENT SCORES

	Pretest Scores Group Y	Posttest Scores Group Y
1	10	10
2	9	5
3	12	5
4	12	3
5	10	7
6	7	4
7	7	7
8	6	8
9	3	6
10	5	6
11	5	6
12	11	5
13	7	3
14	6	8
15	10	7
16	7	5
17	8	6
18	5	4
19	5	7
20	10	6
21	13	8
22	11	9
23	9	8

	Pretest Scores Group Y	Posttest Scores Group Y
24	9	11
25	12	12
26	7	7
27	8	8
28	10	10
29	8	11
30	12	8
31	5	7
32	4	5
33	5	6
34	8	9
35	8	10
36	9	11
37	10	10
38	11	9
39	9	8
40	8	8

D[1]

EXPERIMENTAL RESEARCH SCORES - GROUP X : EXPERIMENTAL GROUP

STUDENT SCORES

	Pretest Scores Group X	Posttest Scores Group X
1	7	10
2	8	12
3	6	12
4	7	13
5	5	11
6	6	12
7	6	9
8	8	8
9	6	13
10	7	13
11	5	12
12	8	13
13	5	12
14	7	13
15	7	12
16	8	11
17	7	12
18	7	11
19	8	11
20	7	10
21	7	13
22	6	11
23	7	10
24	7	7

	Pretest Scores Group X	Posttest Scores Group X
25	9	7
26	9	11
27	9	12
28	8	10
29	9	11
30	5	10
31	7	8
32	8	9
33	7	10
34	10	11
35	11	12
36	10	10
37	8	8
38	8	9
39	9	7
40	10	8

D^2

EXPERIMENTAL RESEARCH SCORES - GROUP Y : CONTROL GROUP

STUDENT SCORES

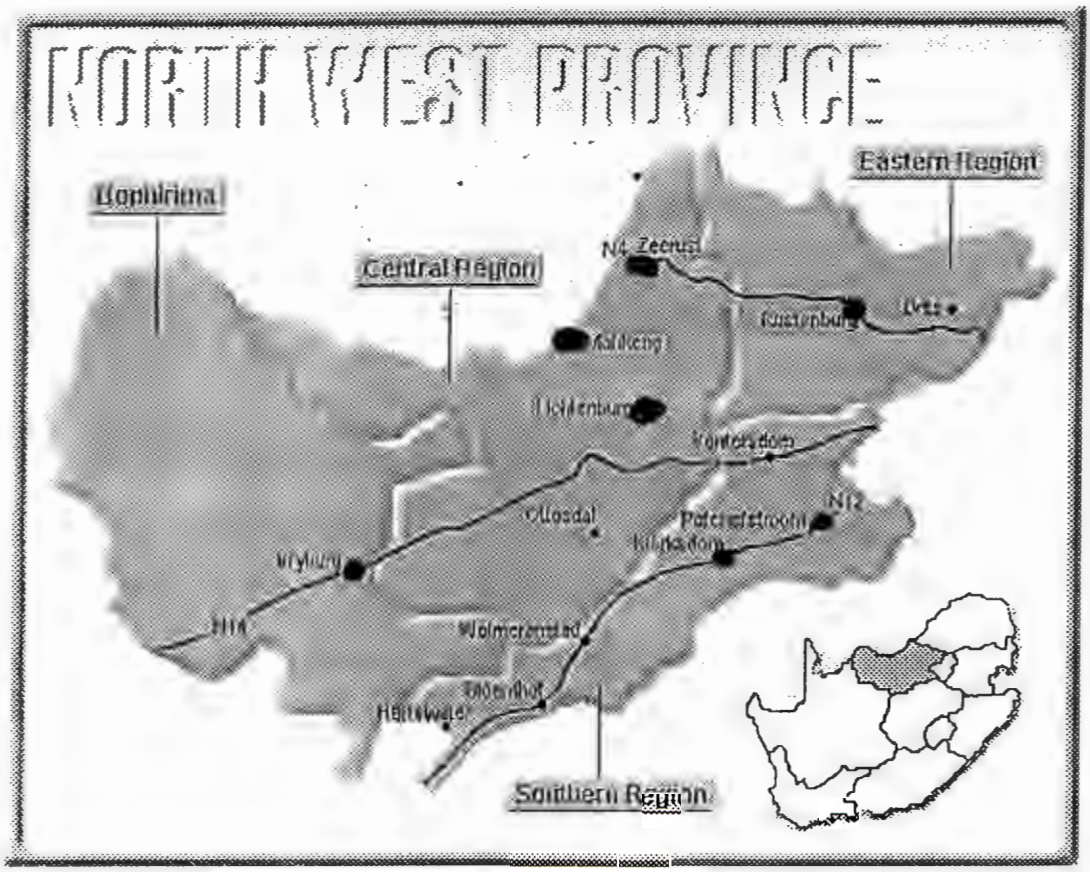
	Pretest Scores Group Y	Posttest Scores Group Y
1	10	7
2	6	8
3	9	9
4	8	11
5	7	10
6	7	8
7	7	10
8	8	11
9	9	10
10	10	7
11	11	6
12	10	9
13	11	8
14	8	10
15	8	9
16	9	10
17	7	11
18	8	11
19	9	12
20	10	11
21	11	8
22	11	8

	Pretest Scores Group Y	Posttest Scores Group Y
23	12	9
24	10	10
25	11	11
26	11	10
27	9	9
28	10	9
29	8	10
30	9	8
31	10	9
32	11	10
33	8	9
34	9	8
35	10	11
36	10	9
37	8	10
38	8	8
39	9	7
40	9	8

APPENDIX G

MAP 1: PROVINCES OF SOUTH AFRICA

MAP 2: NORTH WEST PROVINCE OF SOUTH AFRICA



APPENDIX H

University of North-West

Teaching and Curricu

Private Bag X2046 MMABATH
Republic of South Africa
Telephone : (0140) 892081
Fax No. : (0140) 25775
Telegram : UNW

15 April 2000
Date

Department of Education
Mafikeng District
Lichtenburg District
Zeerust District

Re: PERMISSION TO CONDUCT RESEARCH

Permission is sought to conduct research in high schools in the above-mentioned districts during the period May-June 2000.

RESEARCH TOPIC: TEACHING FOR METACOGNITION. DEVELOPING INDEPENDENT, SELF-REGULATED LEARNERS IN SOUTH AFRICA.

RESEARCHER: K N MAGWENZI
Department of Teaching and Curriculum

SUPERVISOR: PROFESSOR S A AWUDETSEY
Department of Teaching and Curriculum

K N Magwenzi
LECTURER: DEPARTMENT OF TEACHING AND CURRICULUM

Permission has been granted by the Mafeking District Manager

MAFIKENG DISTRICT OFFICE (EDUCATION)
DISTRICT MANAGER / STREEKBESTUURDER
2000 -05- 15