THE INFLUENCE OF LEARNING STRATEGIES ON THE ACADEMIC ACHIEVEMENT OF GRADE 8 SISWATI-SPEAKING LEARNERS IN ENGLISH

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DECLARATION

I declare that the influence of learning strategies on academic achievement of Grade 8 Siswati-speaking learners in English is my own work. It is being submitted for the MAGISTER EDUCATIONIS degree to the University of Potchefstroom for Christian Higher Education, Potchefstroom. It has not been submitted previously, for any degree or examination in any university.

NOKUTHULA VARSITY MTHETHWA
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DEDICATION

I dedicate this mini-dissertation to my parents, Zodwa and Njavia Tembo. May God protect and preserve them.

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SUMMARY

THE INFLUENCE OF LEARNING STRATEGIES ON THE ACADEMIC ACHIEVEMENT OF GRADE 8 SISWATI-SPEAKING LEARNERS, IN ENGLISH L2

The purpose of this study was to determine by means of a literature review and an empirical study whether learning strategies have an influence on the academic achievement of Grade 8 Siswati-speaking learners in English.

From both the literature review and the empirical study it was concluded that learning strategies do have an influence on academic achievement.

The literature review indicated that learning strategies involve three types of strategies, namely cognitive (strategies used to encode information such as elaboration and organisation), metacognitive (strategies used to monitor learning) and resource management strategies (strategies that create a conducive atmosphere to learning such as time management, management of one's environment, exertion of effort and help seeking). All three types of learning strategies were found to be important for learning. For the experimental treatment learning strategies were conceptualized as reading strategies which are learning strategies applied for a specific role (reading) and like learning strategies, reading strategies can be classified as cognitive, metacognitive and resource management strategies.

Equally important to learning is motivation. Motivation involves processes such as expectancy, self-efficacy and attributions. These motivation processes affect the learner's thoughts positively (when a learner is highly motivated) and negatively (when the learner lacks motivation). Expectancy, which is the individual's belief that what one desires will follow one's involvement in a particular task, motivates the learner to take part in learning tasks when it is at a high level, while a low expectancy level causes less involvement as a learner will opt for non-participation rather than being labelled a failure. The more successful a learner is, the higher his self-efficacy becomes.

Self-efficacy is the learner's judgement relating to his capability of performing the learning task successfully. High self-efficacy is a determinant of learning involvement and high achievement. Learners become involved in particular learning activities because they regard themselves capable of performing such activities and they tend to avoid activities perceived as beyond their capabilities. High achievement level associated with high self-efficacy, is characterised by learning strategy use as the learner will do everything possible to aid his/her learning so that success is achieved. High achievers develop a positive outlook in their learning experiences and this affects their attributions.

Attributions, which are the system of beliefs one gives as reasons for one's failures and successes, determine future performance. A highly motivated learner attributes his/her failures to controllable, internal and unstable causes such as effort, which enable the learner to work towards improvement. A less motivated learner attributes his/her failures to stable causes such as aptitude and this limits the learner's chances for improvement as aptitude is fixed.

The empirical study also indicated that learning strategies influence academic achievement. The multiple regression analyses performed using the experimental variables indicated that the learning strategies skimming, prediction and keywords are good predictors of academic achievement as these variables contributed significantly to academic achievement. However, the hypothesis that there is a relationship between learning strategies had to be accepted with reservations as a comparison between the experimental and the control groups by means of a two-sample t-test revealed a statistically significant difference, but no practical significance.

OPSOMMING

DIE INVLOED VAN LEERSTRATEGIEë OP AKADEMIESE SKOOLPRESTASIE VAN GRAAD 8 SISWATI SPREKENDE LEERDERS, IN DIE VAK ENGELS TWEEDE TAAL

Die doel van hierdie studie was om deur middel van 'n literatuur- en empiriese studie aan te toon wat die invloed van leerstrategieë is op die akademiese skoolprestasie van Siswati sprekende leerders in die vak Engels - tweede taal.

Uit beide die literatuur - en empiriese studies, blyk dit dat leerstrategieë wel 'n invloed uitoefen op die akademiese skoolprestasie van leerders.

Die literatuur toon aan dat leerstrategieë drie tipes van strategieë kan insluit, naamlik: kognitiewe strategieë (strategieë om inligting te enkodeer soos organisering en inoefening daarvan); metakognisie (strategieë om die proses van leer te monitor); en bestuur van bronne (strategieë om 'n effektiewe leeromgewing te skep, tydbestuur en bestuur van die leeromgewing). Deur middel van dié studie is bevind dat al die drie leerstrategieë belangrik is vir leer. In die eksperimentele fase is leerstrategieë gekonseptualiseer as lees strategieë, wat dus leerstrategieë is vir 'n spesifieke doel (lees), die strategieë kan kognitief, metakognitief en bestuur van bronne wees.

Net so belangrik soos leer is motivering. Motivering behels prosesse soos verwagtinge, selfdoeltreffenheid en karaktertrekke. Motiveringsprossse beïnvloed die leerder se denkprosesse positief of negatief. Hoë verwagtinge (wat die individu se oortuiging is dat strewes gekoppel word aan die individu se betrokkenheid by 'n spesifieke taak) motiveer die leerder om betrokke te raak by leertake terwyl lae verwagtinge van leerders aanleiding gee tot 'n lae vlak van betrokkenheid. Hoe meer suksesvol die individu is, hoe groter word die selfdoeltreffendheid om take uit te voer.

'n Selfdoeltreffendheidige leerder kan bepaal of 'n leertaak suksesvol uitgevoer is aldan nie. Hoë vlakke van selfdoeltreffendheid word bereik deur betrokke te raak by leeraktiwiteite en prestasie daarin te behaal. Leerders raak betrokke by spesifieke leeraktiwiteite omdat hulle hulself bevoeg ag om sekere leertake binne hulle vermoë te

bemeester en hulle vermy sekere leeraktiwiteite omdat hulle dié aktiwiteite as bo hulle vermoë ervaar. Die vlakke van selfdoeltreffendheid by leerders beïnvloed die redes wat bygedra het vir leersuksesse en mislukkings.

Bydraende faktore wat as redes vir sukses of mislukking aangetoon word is bepalend vir toekomstige akademiese prestasie. 'n Hoogs gemotiveerde leerder skryf mislukkings toe aan beheerbare, interne en onstabiele faktore wat in die pad gestaan het van verbetering. Daarteenoor skryf 'n minder gemotiveerde leerder mislukking toe aan stabiele faktore soos vermoë en beperkte geleenthede vir verbetering.

Die empiriese studie toon aan dat leerstrategieë 'n invloed uitoefen op die akademiese skoolprestasie van leerders. Na ontleding van die meervoudige regressie deur gebruik te maak van eksperimentele veranderlikes toon die resultate aan dat leerstrategieë soos oorsig verkry, vooruitskattings te maak en die identifisering van sleutelwoorde goeie aanduidings is van akademiese skoolprestasie. Dié veranderlikes genoem lewer gewoonlik 'n beduidende bydrae tot akademiese skoolprestasie.

Die hipotese dat daar 'n verband is tussen leerstrategieë en akademiese skoolprestasie moet met sekere voorbehoude as geldig aanvaar word. Deur gebruik te maak van die twee-voorbeelde t-toets is 'n vergelyking getref tussen die eksperimentele en kontrole groep. 'n Ontleding van die toetsresultate toon 'n beduidende statistiese verskil tussen die twee groepe maar feitlik geen noemenswaardige praktiese verskil aan.

CHAPTER ONE

1. THE PROBLEM AND ITS BACKGROUND

1.1 INTRODUCTION AND STATEMENT OF THE PROBLEM

This study was prompted by the high failure rate of Grade 8 Siswati-speaking learners in English in the Badplaas Circuit of Mpumalanga. Parents, learners and school administrators have been worried about the high rate of failure in English and they have been trying to determine the cause of this. The researcher postulates that if learners could use learning strategies, their academic achievement in English would improve. It is for teachers to make learners aware of the value of learning strategies.

Weinstein and Mayer (1986: 316) and 0'Malley and Chamot, (1990: 44) indicate that the use of learning strategies during learning affects the encoding process which in turn affects learning outcomes and performance. Learners who use learning strategies are seen as active information processors, synthesisers and interpreters who assume responsibility for their own learning and take much trouble in controlling their learning environment (Ertmer & Newby, 1996: 7). This study, therefore, attempted to address the question whether the use of learning strategies would improve the academic achievement of Grade 8 learners in English.

1.2 REVIEW OF LITERATURE

Learning strategy use is associated with self-regulated learning which is defined as the degree to which the learner is metacognitively, motivationally and behaviourally an active participant in his own learning process (Zimmerman, 1986: 306). Metacognition, motivation and cognitive strategies interact with one another in such a way that learning is made possible (Zimmerman, 1989: 329). The learning process itself indicates how indispensable learning strategies, metacognition and motivation are to learning.

1.2.1 Learning

According to Schutz (1994: 146), learning is an active, constructive, cumulative and goal-oriented behaviour which engages the use of memory stores such as the sensory register, the short-term memory (STM) and the long-term memory (LTM) to access and store information. The varying activities that the learner engages in as he processes information demands that the learner uses learning strategies to aid his learning by organising and elaborating on information so that what is learnt becomes meaningful. For the learner to be able to use learning strategies he needs knowledge of strategies and learning (metacognition). It is a highly motivated learner that is able to use metacognition and learning strategies maximally in order to aid his learning.

1.2.2 Learning strategies

Zimmerman (1989: 329) defines learning strategies as actions and processes directed at acquiring information or skills that involve agency, purpose and instrumentality, while Weinstein (1987: 590) defines them as behaviours that help to integrate new information with what one already knows. Learning strategies help the learner to attend to tasks, rehearse and elaborate information and monitor their understanding as they learn (Schunk, 1991b: 282). The learner initiates and chooses such action at his own discretion according to the learner's experience and level of motivation (Palmer & Goetz, 1988: 41).

Pokay and Blumenfeld (1990: 42) classify learning strategies into three types, namely:

a) Cognitive strategies, which include the identification of keywords and key sentences, note taking, imagery, elaboration etc.,
b) Metacognitive strategies, which entail monitoring and evaluation, and
c) Resource management strategies, for example, time management, managing one's own environment, effort management and help seeking.

1.2.3 Metacognition

Flavell (1979: 232) defines metacognition as one's knowledge of cognition and the attempt to control cognitive processes, whereas Willemsem (1995: 16) defines it as the selection and evaluation of strategies and knowledge of the learning process. Weinstein (1987: 590) agrees by highlighting control as one aspect of metacognition which is displayed by the ability to monitor, organise and modify one's thinking process (Puntambaker, 1995: 165).

Monitoring and organising one's thinking processes improve academic achievement as the learner applies self-appraisal and self-management (Paris & Winograd, 1990: 17). Metacognition, for example, enables the L2 learner to check his progress from time to time in order to choose the correct learning strategies so that improved performance can result (Babs & Moe, 1983: 434; Weinstein & Van Mater Stone, 1994: 360.)

O'Malley, Russo, Chamot and Stewner-Manzares (1988: 220) conducted a study to determine the effectiveness of the use of metacognitive, cognitive and resource management strategies on the academic achievement of L2 learners in English. The researchers reported that training the learners in the use of strategies improved performance and skills in vocabulary, listening to and speaking in English.

1.2.4 Motivation

Bandura (1986:242) views motivation as a function of thought rather than some instinct or drive as information encoded and transformed into a belief can be a source of action. The action that can be taken after a belief has been formed can be that of one's engagement in self-regulated learning strategies. Pintrich and Schunk (1996: 4) define motivation as a process by which goal-oriented activity is instigated and sustained. The variation in student learning is the result of the intensity of one's level of motivation.

There are a number of different motivational processes which learners use to remain motivated to learn. According to Bandura (1986: 470), some of these processes include expectancy, self-efficacy beliefs and attributions.

Expectancy is the learner's belief that there is a likelihood that something desirable will follow one's involvement in a task (Schunk, 1991b: 97). When the learner has high expectancy of success in performing a task he becomes motivated to attempt that task (Pintrich & Schunk 1996: 77).

Self-efficacy is the personal judgement of the learner's feelings of capability in performing a specific task (Bandura, 1986: 88). Learners involve themselves in learning those tasks they feel capable of mastering, but tend to avoid those they regard as beyond their level of achievement.

Attributions are a system of beliefs about the perceived causes of failures and success (Weiner, 1986: 21). The manner in which attributions motivate the learner is found in the classification of the cause. Causes can be classified according to the dimensions of locus, stability and controllability (Driscol, 1994: 306). If the perceived cause is from within the learner (locus dimension) and if he can control it (controllability dimension), the learner can change the negative results and improve. If failure is attributed to a stable cause such as aptitude (stability dimension), the learner becomes helpless and accepts that he cannot improve his poor performance.

1.3 THE AIM OF THE STUDY

The aim of the study was to determine whether there was a relationship between the use of learning strategies and the academic achievement of Grade 8 Siswati-speaking learners in English L2 in the Badplaas Circuit of Mpumalanga.

1.4 RESEARCH HYPOTHESIS

There is a relationship between the use of learning strategies and the academic achievement of Grade 8 Siswati-speaking learners in English L2.

1.5 METHOD OF RESEARCH

The research consisted of two sections, namely the literature study and an empirical investigation.

During the literature study journals, news bulletins, magazine periodicals, theses and other relevant sources were reviewed. A DIALOG-search was performed with the following keywords:

Learning strategies, academic achievement, English L2, motivation and metacognition.

The empirical investigation was done by giving instruction to learners in reading strategies to determine whether the use of learning strategies has an influence on academic achievement.

1.6 PROCEDURE AND OVERVIEW OF THE STUDY

The aim of the study as already mentioned in 1.3, was to determine whether there was a relationship between the use of learning strategies and academic achievement in English. In order to establish this relationship it became necessary to study relevant literature and consider the various types of learning strategies and how they influence academic achievement. It is for this reason that CHAPTER TWO deals with the influence of learning strategies on academic achievement. Because of the important role played by motivation in the use of learning strategies and learning in general CHAPTER THREE deals with the influence of motivation on academic achievement. An empirical study was conducted to determine whether the use of learning strategies influences academic achievement and CHAPTER FOUR outlines the method of research. In CHAPTER FIVE the results of the empirical study are presented, analysed and interpreted. CHAPTER SIX presents a summary of the research, which includes the limitations of the study and the recommendations.

CHAPTER TWO

2. THE INFLUENCE OF LEARNING STRATEGIES ON ACADEMIC ACHIEVEMENT

2.1 INTRODUCTION

Learning strategies play an important role in supporting and facilitating one's learning. The chapter takes learning as its starting point and approaches it from a cognitive point of view. Learning is defined in paragraph 2.2.1 and is followed by information processing which is discussed in paragraph 2.2.2. The information processing system involves the three memory stores that are discussed in paragraphs 2.2.2.1, 2.2.2.2 and 2.2.2.3. Learning strategies are then discussed in paragraph 2.3 followed by metacognition, which is discussed in paragraph 2.4. The chapter is concluded with a discussion on how learning strategies influence academic achievement in paragraph 2.5.

2.2 LEARNING

According to Ormrod (1990: 4), learning is a human activity that engages mental structures or memory stores to acquire knowledge. Acquisition of knowledge is seen as the result of organisation, coding, rehearsal and storage of information in the memory system (Schunk, 1996a: 12). All new information acquired later is then incorporated into the existing stored information so that the old and new are integrated into one knowledge structure.

2.2.1 Definition of learning

Learning is defined as a change in a person's thoughts and behaviour, which persists over time (Thomas, 1989: 251). The kind of change associated with learning is detected by comparing what behaviour and thoughts were possible before an individual was placed in a learning situation, with the behaviour displayed after learning (Gagné, 1977: 3). Ormrod

(1990: 6) maintains that the change should take time and be distinguishable from the change associated with physical growth and maturation.

Shuell (1988: 277) and Schutz (1994: 146) define the process of learning as an active, constructive, cumulative and goal-oriented process. Learning is active in that the learner has to do certain things while processing incoming information, for example, the active selection of stimuli and the organisation of material so that it can be easily stored (Weinstein & Underwood, 1985: 242; Shuell, 1990: 3). To display the constructive status of learning, the learner generates suitable mental elaboration to expand and relate new information to existing knowledge in memory. (Weinstein & Underwood, 1985: 242; Mayer 1992: 408; Shuell, 1990: 3).

According to Shuell (1986: 416), the merging of new information with prior knowledge indicates the cumulative nature of learning. New information builds upon the learner's prior knowledge and it is this prior knowledge that determines what is to be learned and how it should be learned (Shuell, 1986: 417).

Schunk (1991b: 74) and Shuell (1988: 278) stress that effective learning depends on identifying a goal and pursuing it. Setting some objectives or outcomes that are to be achieved at the end of one's learning serves as a goal. These objectives or outcomes raise the learner's expectations towards fulfilment of set objectives (Shuell, 1990: 4; 1988: 278). Each milestone that is reached helps the learner to gauge how much progress he is making towards attaining a set goal. This process increases focus and interest in one's learning so that the learner's total involvement is obtained. It is for the above reasons that Puntambekar (1995: 163) maintains that to a good learner, learning is a planful and purposive activity.

2.2.2 The information processing system

The information processing system is a group of mental activities that occur simultaneously or in sequence to co-ordinate learning and perception during the learning process (Schunk, 1991b: 127). The mental activities that one engages in during information processing are aimed at committing what one learns to memory, hence the processing of information takes place in the memory stores (Ormrod, 1990: 209).

Matlin (1989: 69) maintains that there are three memory stores, namely the sensory register, the short-term memory (STM) and the long-term memory (LTM). Early researchers in learning regarded the three memory stores as separate structures (Adams, 1967: 40, Kintsch, 1977: 210, Lindsay & Norman, 1972: 287), a view that has been eradicated over time. Contemporary researchers view the memory stores as attached to the same structure, but having different levels of processing where processes such as storage, encoding and retrieval of information take place (Ormrod, 1990: 210; 1995: 312; Matlin, 1989: 69; Cormier, 1986: 280).

2.2.2.1 The sensory register

The sensory register serves as an input inlet through which information enters the memory system from the environment (Mischel, 1989: 422). The sensory register has the capacity to register information using all five human senses (Mischel: 1989: 422), thereby enabling the learner to access information. More than one sense can operate at the same time independently of one another (Schunk 1991b: 149).

After the relevant sensory register has registered the information, it is held for a brief moment in the exact way in which it was received (Reed, 1988: 4) before it is processed. For example, if the sensory input was a sound, the echo of the original sound will be heard for a few seconds after the original sound has stopped.

Learning theorists have different views on the length of stay of information in the sensory register. Matlin (1989: 24) maintains that information remains between 250 and 500 milliseconds in the sensory register, depending on the type of sense used. While Ormrod (1990: 212) propounds the view that auditory input can last even longer than visual information (up to four seconds). The reason for this variation is that speech is understood in its context, so the learner needs to wait until the last word is spoken to get the full meaning of what is said (Ormrod, 1990: 212). Although views vary on the length of time, the fact that information remains for a brief moment is confirmed otherwise it gets lost, unless it is attended to (Klatzky, 1975: 88; Reed, 1988: 33).

The registering of information during its stay in the sensory register warrants the use of strategies such as paying attention and selection of what to learn. Because more than one sense can be activated at a time, the learner needs to focus on what he wants to learn; otherwise learning cannot take place. Lloyd and Loper (1986: 336) stress that attention plays an important role in academic achievement and they suggest an intervention programme for learners who cannot pay attention.

2.2.2.2 The short-term memory (STM)

The STM is a temporary store through which information passes before entering the long-term memory (LTM) for permanent storage (Cormier, 1986: 281). The STM is also referred to as the working memory as it is used for active operations such as the integration of information registered in the sensory register with information already stored in the LTM, the holding of information while one is using it (like when one dials a telephone number) and the retrieval of information already stored in the LTM (Schunk, 1991b: 140; Ormrod, 1990: 213; Louw & Edwards, 1993: 294). When this process is in operation, information stored over a long time can be accessed right away. It is this reactivation of long stored information that results in STM being viewed as the most important memory store (Reed, 1988: 56).

The STM has a very limited capacity for storing information. This limited memory capacity is referred to as the memory span of the STM (Schunk, 1991b: 140; Adams, 1977: 230). The memory span is the ability to recall a certain number of items that have just been learned and it is set at seven plus or minus two items (Cormier, 1986: 94; Ormrod, 1990: 213; Matlin, 1989: 94).

Although the capacity of the STM is limited, chunking can increase it (Kintsch, 1977: 190). Chunking is the process of organising single pieces of information into larger units to form meaningful entities that can easily be recalled (Ormrod, 1990: 212; Schunk, 1991b: 152). Different methods are used for chunking. Items can be grouped in a meaningful way by using their physical structure or the way in which they relate to each other. A song can also be composed using the items that need to be committed to memory (Matlin, 1989: 96). For example, memorising a telephone number (0132826198) consisting of ten digits can be made easy by chunking the numbers according to the area code, the town code and the real number which will not be more than four numbers. In the end only six units have to be recalled and that number is within the STM limit.

The duration of information in the STM is between five and twenty seconds. Information that remains longer than twenty seconds gets lost, unless rehearsed and processed further. (Matlin, 1989: 71; Ormrod, 1990: 216). The limited duration allows room for the use of learning strategies. To prepare the information for long-term storage, the processes of rehearsal and encoding are set into motion (Ormrod, 1990: 246; Driscol, 1994: 82). Rehearsal is discussed in detail in paragraph 2.3.2.1.

Encoding is the process by which incoming information is related to concepts and ideas already stored in one's memory in order to make retrieval easy when the information is needed (Driscol, 1994: 84). Encoding takes place in two main ways, namely organisation and elaboration (see paragraph 2.3.2.2 and 2.3.2.3 for a detailed discussion) (Ormrod, 1990: 239; Schunk, 1991b: 170).

2.2.2.3 The long-term memory (LTM)

The LTM is that part of the human memory which stores large amounts of information indefinitely (Klatzy, 1975: 130; Robeck & Wallace, 1990: 97). Information stored in the LTM includes all previous experiences, formulas for solving problems, values and goals (Lindsay, & Norman, 1972: 289). For example, when a learner is given a mathematical problem to solve using a known formula, he first goes through his LTM to retrieve the formula and then applies it to the problem on hand.

The LTM has an unlimited capacity (Ormrod, 1990: 217). One never reaches a stage when one feels that new information cannot be absorbed anymore because the LTM is full (Reed, 1988: 82). However, sometimes information cannot be retrieved from the LTM. This might be due to lack of proper retrieval cues (Reed, 1988: 82; Schunk, 1991: 141), interference between old and new information (Gagné, 1985: 73) or searching for information in a wrong place in the LTM (Ormrod, 1990: 274). The fact that the LTM has a large store of information indicates a need for an organised structure and elaboration of information before it is stored, otherwise retrieval becomes difficult (Schunk 1996a: 152). Organisation and elaboration are learning strategies and are discussed in paragraphs 2.3.2.2 and 2.3.2.3.

2.3 LEARNING STRATEGIES

2.3.1 Definition of learning strategies

Learning strategies are a series of deliberate behaviours, thoughts and actions that the learner engages in during learning to influence the encoding process (Schunk, 1991b: 282; Schmeck, 1988: 5; Wittrock, 1986: 310). Learning strategies perform a variety of functions with reference to student learning. They help a learner to attend to tasks, monitor his progress, retrieve information from memory, create and maintain a favourable climate conducive to learning (Schunk, 1991b: 3). Oxford (1990: 8) adds that learning strategies make learning easier, faster, more enjoyable, more effective and more

transferable to new situations. These various duties performed by learning strategies indicate the different types of strategies that are in existence.

In the context of this research learning strategies are contextualised as reading strategies. According to Du Plooy (1995: 31), reading strategies are the mental processes applied to accomplish reading tasks. They are learning strategies applied for a specific purpose like reading and they include strategies such as skimming, prediction, finding keywords and key sentences, summarising, paraphrasing and others. Reading strategies cut across the classification of learning strategies suggested by Pintrich (1989: 130) (see paragraph 2.3.2.2 & 2.4.4.1) as cognitive, metacognitive and resource management strategies.

2.3.2 Cognitive strategies

Cognitive strategies are those strategies that are directly involved with the encoding and retrieval of information from LTM (Pokay & Blumenfeld, 1990: 42; Karabenick & Collins-Eglin, 1996: 74; Bjorklund & Broaddus, 1990: 97). Encoding information involves integrating new information with the information known and already stored in one's long-term memory (LTM) so that it becomes part of one's knowledge (Weinstein, 1987: 590; O'Malley & Chamot, 1990: 44). Weinstein and Mayer (1986: 315) identify three types of cognitive strategies, namely, rehearsal strategies, elaboration strategies and organisation strategies.

2.3.2.1 Rehearsal strategies

Rehearsal strategies are used to repeat information in order to facilitate verbatim recall or to hold on to information so that it does not fade before being committed to memory (see paragraph 2.2.2.2) (Weinstein, 1987: 592). A distinction is made between rehearsal strategies used for basic tasks and rehearsal strategies used for complex tasks (Weinstein & Mayer, 1986: 317).

- ***Rehearsal strategies used for basic tasks***

Rehearsal strategies used for basic tasks are those used for reciting or repeating the information during learning, with the aim of verbatim reproduction (Schunk, 1991b: 284). These strategies are also used for maintenance of information in the working memory for some designated period before encoding occurs to avoid fading (Ormrod, 1990: 216; Driscol, 1994: 83). An example of maintenance rehearsal occurs when one repeats a telephone number just before it is dialled or written down. If the number is not rehearsed it is forgotten. Strategies used for rehearsal of basic tasks are naming things, repeating information in the order it is presented in, for example the planets and the music lines (Weinstein & Mayer, 1986: 317; Weinstein & Meyer, 1991: 20).

- ***Rehearsal strategies for complex tasks***

Rehearsal strategies for complex tasks are used to actively say, write or point to parts of the learning material presented earlier (Weinstein & Mayer, 1986: 318). The aim of using such strategies is to select important aspects from the main text and make sure that acquisition of the information occurs (Weinstein & Mayer, 1986: 318). This type of rehearsal is what is called elaborative rehearsal (Lloyd & Edward, 1993: 296; Gagné, 1985: 55). Strategies used for rehearsing complex tasks are highlighting or underlining and taking notes (Pintrich, 1989: 130).

Underlining as a rehearsal strategy is done by drawing a line under the important information and highlighting refers to the shading of the information using a light coloured marking pen (Shain, 1992: 83). Both strategies are used to make location of information easy (Shain, 1992: 83; Usova, 1989: 10). Unless underlined or highlighted material is processed further, these strategies as such do not help the learner to integrate new information with prior knowledge (Pintrich, 1989: 130; Wade & Trather, 1989: 40).

Note taking as a rehearsal strategy is done by writing selective verbatim points when listening to instructions or a lecture (Weinstein & Mayer, 1986: 318; O'Malley *et al.*,

1988: 220; Schunk, 1991b: 287). Weinstein and Mayer (1986: 318) believe note taking helps the learner acquire information by capturing the main ideas although there are some conditions when this occurs. One condition was observed by Shrager and Mayer (1989: 263) in a study during which subjects were required to take notes from a videotaped lecture on cameras. When testing the note takers on recall and transfer, note-takers with slight low prior knowledge of cameras performed better than non-note-takers. Note-takers with a high level of prior knowledge of cameras did not show any improvement in their knowledge. It was then concluded that note taking does facilitate learning if prior knowledge of the task is low.

King (1992: 303) maintains that in order for note taking to benefit the learner, notes taken must be processed further to the integration of the new information with the old. A study conducted using college students determined how different well-taught strategies for note review facilitate learning (King, 1992: 303). College students were taught different strategies for reviewing their notes. When students were later tested on how much they had learned, it was found that their retention of the content was much better than that of students who did not review their notes.

2.3.2.2 Elaboration strategies

Elaboration is the process of expanding upon new information by adding or linking it with what one already knows (Matlin, 1989: 79; Schunk, 1991b: 157). Ormrod (1990: 254) refers to elaboration as reading between the lines which means that the learner does not only absorb the new information as it is in front of him/her but adds relevant bits that are already stored in his/her own LTM, if the subject was dealt with before so that encoding is ensured. Retrieval is also guaranteed because even when the exact form of the new information cannot be accessed, the learner always remembers the elaboration and then is helped to recover lost information (Schunk, 1991b: 157).

Elaboration strategies help the learner by creating a symbolic construction, which is either imaginable or verbal (O'Malley *et al.*, 1988: 221; Pressley & McCormick, 1995b: 31). An

example of a verbal addition is when the car registration number TCY is referred to as TRACY with the additions of RA to help recognition and knowledge. TRACY is a girl's name one is familiar with and therefore, the car's registration number becomes meaningful and is committed to memory. Weinstein and Mayer (1986: 319) and Weinstein (1987: 592) distinguish between elaboration strategies used for basic tasks and those used for complex tasks.

- ***Elaboration strategies used for basic tasks***

Elaboration strategies used for basic tasks are those used to learn short lists of words by generating sentences or mental images that connect what has been learnt and what the learner already knows (Weinstein, 1987: 592). The learner is helped to form associations between the listed items and what he already knows so that integration occurs (Weinstein, 1987: 319). Elaboration strategies for basic tasks are highlighted as those used for serial list learning, paired associate learning and free recall learning (Weinstein & Mayer, 1986: 319).

Serial list learning involves learning a series of words with the aim of recalling them later according to their sequence by using associations (Weinstein & Mayer, 1986: 135; Weinstein, 1987: 592). Strategies used for serial list learning are the formation of acronyms and acrostics (Snowman, 1986: 252). Combining the first letters of a group of words to form single words that are easily comprehended is the way to form acronyms. For example, the acronym SACE stands for South African Council for Educators. Acrostics are formed by creating a sentence from single words that one wants to learn (Schunk, 1991b: 286; Higbee, 1988: 73). An example of an acrostic formed for the musical key lines EGBDF is Every Good Boy Deserves Food.

Paired associate learning involves the formation of associations between two or more words (the known one and the new one that is learnt) by making use of images (Weinstein & Mayer, 1986: 319). The images formed can be visual or mental (Ormrod, 1990: 286; Pressley & McCormick, 1995b: 223). The keyword method, the peg word method and the

method of loci are examples of methods used for this type of learning (Belleza, 1981: 251; Weinstein & Mayer, 1986: 319). Although young learners can be trained to use imagery, mature learners manage them better. In a study conducted by Levin and Pressley (1978: 691) to test the relationship between the use of imagery and maturity, it was discovered that the maturity of a learner does affect the quality of images the learner makes. The study used kindergarten children and in spite of the age of the children the research indicated a certain degree of influence of imagery on academic achievement. However there were also signs that the subjects' age hindered the full utilisation of the strategy.

The keyword method was devised in the 1970s as a strategy to learn foreign language vocabulary and it involves two steps (Snowman, 1986: 256). Firstly, the learner finds a familiar meaningful word (in own language) that bears an acoustic similar to the one the learner is trying to learn (Schunk, 1991b: 287). Secondly, the learner has to create some mental images using properties of the two words (the foreign word and the mother tongue) (Hogben & Lawson, 1994: 367). The properties should associate the foreign word with the mother tongue's corresponding word, in order to facilitate meaning (Bonds, Bonds & Peach, 1992: 58; Wang, Thomas & Oulette, 1992: 587). For example, to learn the English word 'duck', a Zulu learner creates a mental image of 'mud' because the word 'duck' rhymes with 'udaka' (mud) in Zulu. The learner can then create a mental image of a duck playing in a muddy area in order to learn the foreign word 'duck'.

Wang *et al.*, (1992: 520) assessed the effect of keyword mnemonics in a study where subjects received instruction in using the keyword method in foreign language vocabulary learning. When testing the effect of the strategy it was found that learners had successfully learned the new words and they could use them long after the instruction, but those learners with no training in this strategy could not do so.

The peg word method is a strategy used to learn a sequence of items by using pre-memorised concrete nouns to 'hang' the items that are learned (Schunk, 1991b: 286). The concrete nouns used correspond with numbers one to ten as follows:

One is a bun
Two is a shoe
Three is a tree
Four is a door
Five is a hive
Six is sticks
Seven is heaven
Eight is gate
Nine is a line
Ten is a hen (Higbee, 1977: 122; Ormrod, 1990: 287; Snowman, 1986: 254).

The learner uses the nouns bun, shoe, tree, door, hive, sticks, heaven, gate, line and hen to pair with the new items that are learnt (Higbee, 1977: 123). If the first item to be learned is watch, the learner pairs watch with bun for example, 'bun is a watch'. The learner then thinks of a bun with a drawing of a watch to help learning. The second item is paired with shoe and the third with tree and so on.

- ***Elaboration strategies used for complex tasks***

Elaboration strategies used for complex tasks are mainly used to integrate new information with prior knowledge stored in the LTM (Weinstein & Underwood, 1985: 243). The strategies used are summarising, creating analogies, creating generative notes and paraphrasing (Weinstein & Mayer, 1986: 319).

Summarising is a strategy whereby the content of a passage is presented in fewer words (Barrass, 1984: 90). The few words written down consist of only the main ideas and their immediate supporting ideas (Phipps, 1983: 100). To be able to choose main ideas from less important ideas, the learner has to process the information deeply (Hooper, Seles & Rysavy, 1994: 54). The deep processing that accompanies summarising facilitates understanding, as the learner attaches meaning to what he learns (Pressley & McCormick, 1995a: 469). In a study conducted by King (1992: 303), using college students, it was

found that summarising facilitates recall. College students who used summaries recalled most of the lecture content immediately after it was presented as opposed to the students who received no training and did not use summaries.

Analogy is the skill of forming associations between two concepts, a known one and a new one that is learnt, to assist one's thinking process (Halpern, Hansen & Reifer, 1990: 298). When one is learning a new and a complicated concept, learning becomes easier when the concept is compared with what is known already (Du Toit, Heese & Orr, 1995: 247). For example, when one learns about the circulatory system, one can compare the functioning of veins and arteries to that of a two-way traffic with trucks moving on each side. The trucks on one side of the road deliver goods that are clean from the laundry. Those on the other side of the road load the dirty laundry and transport it to where it is cleaned. Analogy is very effective when learning new concepts. McDaniel and Donnelly (1996: 508) confirmed this in a study they conducted. It was found that analogy does improve learning, in general, but it must be used with another strategy to ensure the grasp on factual learning because the strategy seems to be weak in that aspect.

Hooper *et al.*, (1994: 53) conducted a study and compared the influence of summaries and analogies on academic behaviour. The study involved 111 undergraduate students who were divided into 6 groups. One of the groups was given texts to summarise while the other groups did analogies. Students in the first group were precisely guided on how to write summaries while the other groups received guidance in analogies. At the end of the treatment period the analysis of the results revealed that although the achievement of all the students that took part in summary and analogy strategy training had improved, the students trained in summaries performed better than those trained in analogies.

Paraphrasing refers to writing what one has read in one's own words (Beyer, 1987: 197). The learner transforms what he has read and makes it his own by making some additions and alterations derived from his own knowledge (Ormrod, 1995: 54). This helps the integration of prior knowledge with new information into one rich knowledge base that assists the learner to interpret more new information (Ormrod, 1995: 254).

2.3.2.3 Organisation strategies

Organisation is the grouping of information according to its relation in the short-term memory to prepare it for long-term storage. Storing information in organised units facilitates learning and retrieval because information is easily located when needed (Driscol, 1994: 84; Pintrich, 1989: 31). The benefits of organisation derive both from the processing that the learner involves himself in when organising the learning material and from the structure that is ultimately formed (Driscol, 1994: 84). Strategies used for organisation are also categorised into those used for basic tasks and those that are used for complex tasks (Weinstein & Mayer, 1986: 321).

- ***Organisation strategies used for basic learning tasks***

Organisation strategies used for learning basic tasks sort things according to their common features or attributes (Weinstein & Meyer, 1991: 21). Examples of such strategies are grouping information into common families such as living things and non-living things. Foreign words can also be grouped according to their tenses, meanings or the forms of speech they display.

- ***Organisation strategies used for complex learning tasks***

Organisation strategies used to learn complex tasks select and organise information that is to be committed to the LTM (Pintrich, 1989: 131). Strategies used for organising complex tasks are outlining, text mapping, fish netting, networking and forming hierarchies (Weinstein & Mayer, 1986: 322; Weinstein, 1987: 582).

Outlining is a strategy used to select and organise information according to their internal connections (Tuckman, 1993: 6). Once the internal connections are identified, the main and minor ideas are written in concise form, showing how they relate to one another. Outlines are very useful when used for the reinforcement of what has been learnt from

texts (Mayer, 1987: 192; Du Toit, *et al.*, 1995: 264). An example of an outline of a paragraph on climatology is as follows:

1. Climatology - influencing factors

1.1 Height above sea level

1.2 Distance from the sea

1.3 Rainfall

In a study conducted by Tuckman (1993: 5), 182 undergraduate students participated in an experimental treatment that aimed at determining the effect of the combined use of elaboration and outlines on academic achievement. The concept of colour-coded outlines was introduced. Learners were provided with normal outlines, which they had to colour as they learnt. The control group read information from a traditional text. At the end of the study learners had to answer questions about the information they had read. The results indicated that the performance of the group that did colour-coded outlines was significantly better than the results of all the other groups.

Text mapping is an organisation strategy used both to identify and portray the relationship between main ideas and their supporting ideas by making use of a diagram (Baird & Northfield, 1992: 218). When text mapping is done one *firstly* identifies the various parts of a text i.e. the keywords, the key sentences and their supporting ideas. A keyword is the most important word or phrase in a sentence or a paragraph whereas a key sentence is the most important sentence in a paragraph (Du Toit *et al.*, 1995: 66). Should a keyword be omitted, the text will not make sense (Cretchley & Stacey, 1983: 14). In the following passage the keyword appears in bold print:

***Sulphur gases** in the air are also dangerous to health. Sulphur gases are given off when coal and oil are burnt. When these gases mix with water vapour in the air, a weak acid is formed. This is very bad for the lungs. If a person already suffers from lung disease such as bronchitis or asthma he gets much worse if he breathes in air polluted with sulphur gases.*

Once the keywords and sentences are identified one has *then* to record what has been identified in a diagram indicating how the parts of the paragraph relate to each other (Du Toit *et al.*, 1995: 64; O' Donnel, 1994: 34; Ormrod, 1990: 240). A diagram is then drawn using one or a variety of coloured pens. When more than one coloured pen is used, each pen is used for a related group of ideas (Du Toit *et al.*, 1995: 66). Basically the structure of a text map is that of a bicycle wheel with a centre from which all the outlets spikes are attached. Various text maps are used for different types of texts, for example clusters, branching notes, tree diagrams and spider webs (Du Toit *et al.*, 1995: 66). An example of a text map on 'social insects' can be represented as follows:

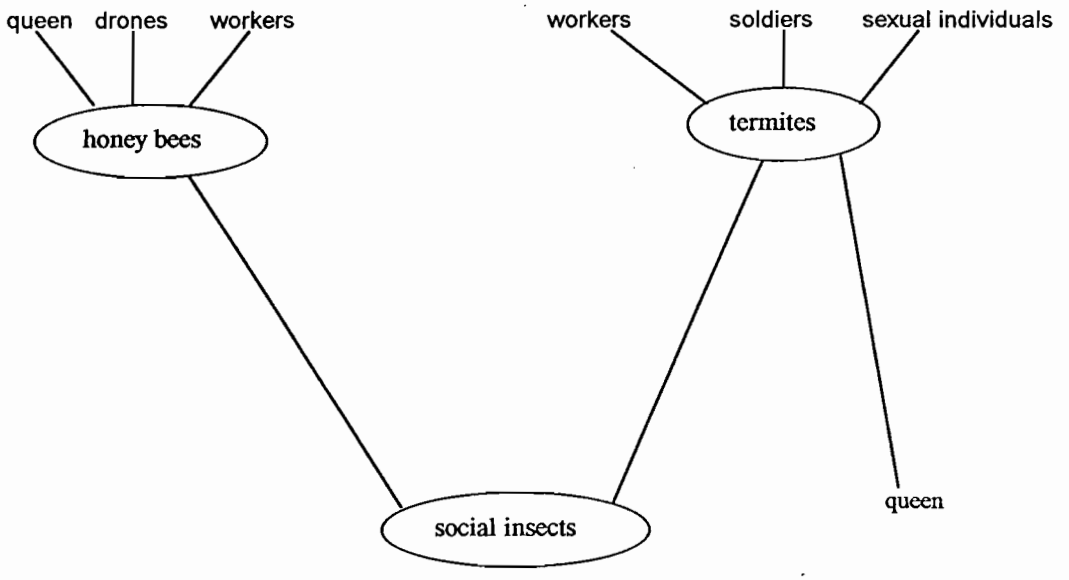

FIGURE 1: A text map diagram of Social insects.

Text mapping helps the encoding of information and by so doing they enhance learning (O'Donnel, 1994: 36). In a study conducted by Scevak, Moore and Kirby (1993: 401) the effectiveness of the text map strategy was determined. History learners were taught how to draw text maps after studying content. Another group of learners was not taught the strategy and they proceeded as normal. When testing recall three weeks later, the trained group outperformed the control group in factual retention.

Information presented in text maps is also more easily learned than that presented in normal text form. In a study conducted by Hall and Sidio-Hall (1993: 291), university students participated in an experiment in which they had to acquire information from text maps. Another group of students used traditional texts with the information presented as headings, explaining different aspects. Learners had to study the information for 45 minutes. Two days later subjects were required to recall the information they had learnt from the text maps and the traditional texts. The analysis of the results indicated that the learners who had studied information from text maps outscored the students who had used traditional texts. This trained group recalled most of the material they had studied when compared with the other group that did not.

The fishnet strategy links information like a net. This strategy is more or less similar to the network strategy (Mischel, 1989: 423). Both strategies link information according to its relationship, for example, kind and structure. The strands link the information to the other information already stored in memory and by doing this retrieval is made easy (Ormrod, 1990: 236; Schunk, 1991b: 170). The fishnet strategy and the network strategy can be used to learn a list of words such as aeroplane, boat, ship, gondola, submarine, jet, bus, van and truck. In order to learn this list, the learner will first have to discover that the list consists of things used for transport. Organising the list further the learner arranges the list according to water transport, land transport and air transport. The fishnet of the list can be represented as follows:

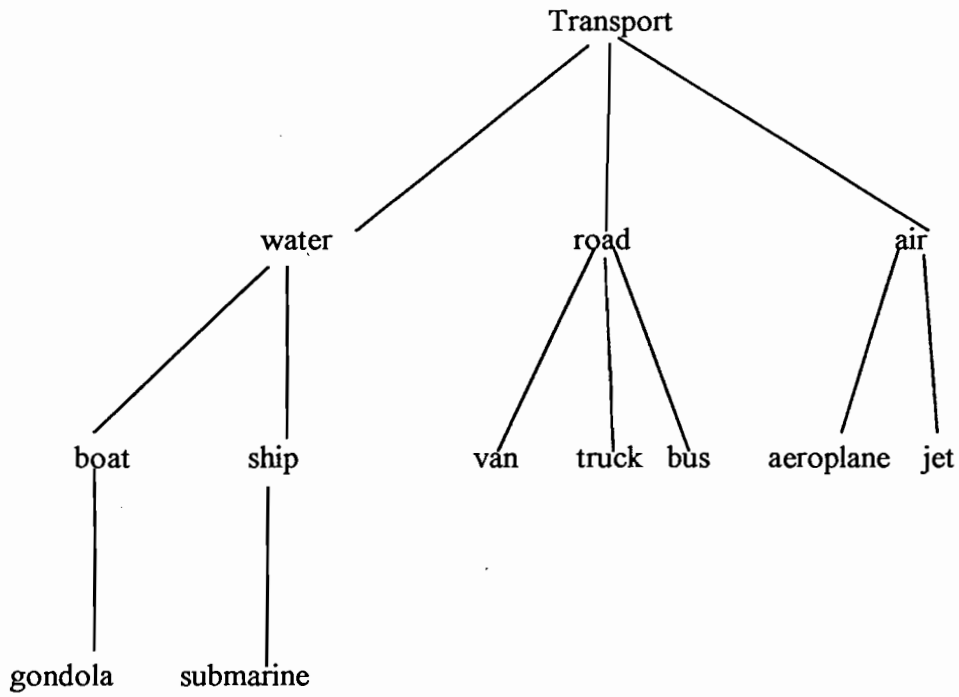

FIGURE 2: A fishnet diagram of transport.

The last organisation strategy to be discussed is the hierarchy. The learning hierarchy is an arrangement of information showing the main class(es) at the top with subclasses emanating from the main classes at the bottom, in diagram form (Gagné & Briggs, 1974: 109; Ormrod, 1990: 236). Using a hierarchy as a strategy involves arranging the information according to classes in a vertical way (Cormier, 1986: 288; Ormrod, 1990: 226). The connections that connect the different levels facilitate the search and easy access of information stored during retrieval (Ormrod, 1990: 237). A hierarchical presentation of the information on social insects can be represented as follows:

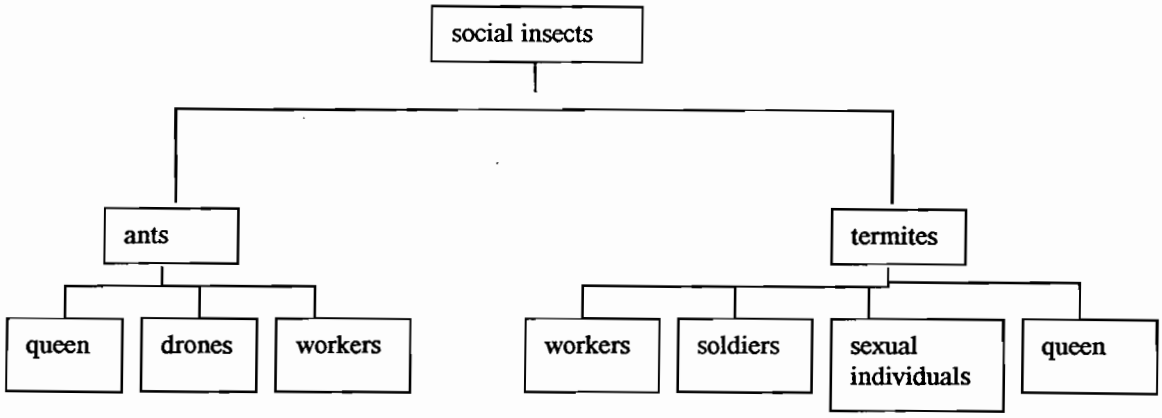

FIGURE 3: A hierarchical diagram of social insects.

The use of hierarchy facilitates learning whether one learns from it or creates one after learning. In a study conducted by Robinson and Kierwa (1995: 455) it was found that learners who had difficulty learning the ordinary text found it easy to learn from hierarchies and also that they acquired more information than they normally did.

Learners do not automatically use strategies. They need strategy training (Weinstein, Meyer & Van Mater Stone, 1994: 363). Once the learner starts using learning strategies, he gains experience in learning and using strategies. This experience develops metacognition that concerns skills to monitor and regulate one's learning. Andreassen and Waters (1989: 190) investigated the relationship that exists between organisation and control of one's memory (metamemory). Sixty-five graders were first trained in organisation strategy where they were given guidance on how to organise given pictures in order to recall them. Learners were also asked to reflect on how they applied the strategy. The study revealed that learners used the organisation strategy immediately after they had been trained on how to use it. Strategy monitoring skills that were imparted through reflection surfaced later as the learners used strategies.

2.4 METACOGNITION

Metacognition is a higher order skill that comes with experience and it involves thinking about thinking (Flavell, 1979: 232; Willemsen: 1995: 16). Metacognition enables the learner to be aware of how he thinks. Such awareness includes knowledge of the existence of various strategies, which involves the awareness of when and why strategies should be used when learning. Learners with effective metacognitive skills accurately estimate their knowledge, use that knowledge properly when learning, monitor their ongoing learning and develop effective plans for new learning (Weinstein *et al.*, 1994: 360; Stewart & Tei, 1983: 36; Everson, Tobias & Laitusis, 1997: 1). Bruer (1993: 7) refers to such learners as expert learners since they know more, have organised and integrated knowledge that they use and apply well, are motivated and direct their learning in a more self-regulatory manner (Weinstein *et al.*, 1994: 32).

2.4.1 Definition of metacognition

Metacognition is defined not only as knowledge of one's own cognition, but also as the deliberate, conscious regulation and control of one's thinking (Flavell, 1976: 232; Wellman, 1985: 2; Gordon & Braun, 1985: 2; Paris & Winograd, 1990: 17; Ertmer & Newby, 1996: 3). This definition implies two types of components. The first one is knowledge of cognition and the second is control and regulation of cognition (Bonds, Bonds & Peach, 1992: 56; Fisher, 1995: 34) or self-management (Jacobs & Paris, 1987: 259).

The use of knowledge and control in metacognition occurs in an interactive manner. Students' knowledge of themselves influences their judgements on how they handle tasks, and this in turn affects the strategies learners choose and how they use them (Ertmer & Newby, 1996: 6). The integration of one's knowledge and control of how this knowledge is applied, is a conscious and deliberate action that ensures the flow of the learning process (Brown, 1980: 455).

2.4.2 Metacognitive knowledge

Metacognitive knowledge refers to self-awareness of one's own thinking (Engelbrecht, 1990: 57). It includes one's own cognitive processes such as memory, perception and understanding (Babs & Moe, 1983: 428), understanding the task demands, understanding how strategies are used and knowing the comparative relationship between the types of knowledge mentioned above (Ertmer & Newby, 1996: 6). The comparative facts of cognitive processes, task demands and learning strategies acquired, whether positive or negative, are used to direct the learner's thinking and behaviour (Ertmer & Newby, 1996: 6; Yuill & Oakhill, 1991: 113). These facts guide the learner to choose certain learning tasks, learning strategies and they also determine how the learner learns. Flavell (1979: 907) categorises knowledge of cognition or metacognitive knowledge into knowledge of the self as learner, knowledge about the learning task and knowledge about strategies.

2.4.2.1 Knowledge of the self as learner

Knowledge of the self as a learner refers to one's beliefs about oneself and others as learners (Flavell, 1979: 907; Brown, 1975: 113; Paris & Winograd, 1990: 27). According to Weinstein (1993: 5), knowledge of the self as a learner includes knowing about personal characteristics such as one's strengths and weaknesses and preferences that direct and impact on one's learning. Flavell (1979: 907) distinguishes between knowledge of intra-individual differences, knowledge of interindividual differences and knowledge about the universals of cognition (Flavell, 1979: 907).

Knowledge of intra-individual differences involves knowing what type of cognitive tasks an individual performs best or worst (Alexander, Schallert & Hare, 1991: 328). Wenden (1989: 576) views knowledge of intra-individual differences as one's self-concept as a learner. It is the grouping of all the beliefs concerning one's permanent and temporal characteristics relating to learning (Paris & Winograd, 1990: 27). An example of this type of knowledge is that a learner may know that he learns very well by merely listening to

lectures without taking notes rather than by listening and trying to take notes at the same time.

Knowledge of interindividual differences is the awareness of how a learner compares himself with other people and the comparison of other people as learners with regard to a variety of tasks (Matlin, 1989: 237). A learner may know that he is not as intelligent as his parents are. At the same time he may realise that his mother is more intelligent than his father is. Such knowledge helps when he/she has to ask for help.

Knowledge of the universals of cognition refers to the facts and beliefs a learner acquires about how learning occurs in general, the nature of knowledge and which variables influence learning (Alexander *et al.*, 1991: 328). Knowledge of the universals of cognition is acquired over time through involvement in learning situations (Wenden 1989: 576). The learner develops insight into concepts such as understanding, the capacity of human memory, its limitations and mode of behaviour (Flavell & Wellman, 1977: 11). An example of this type of knowledge can be the realisation of the fact that something that has been learned cannot always be remembered.

Paris and Newman (1990: 4) indicate that the beliefs about this type of knowledge change as learners progress through school. A 7-year-old's conception of knowledge differs from that of an 18-year-old. At the beginning of school life knowledge is characterised by naiveté and as the years progress, it becomes more realistic (Paris & Newman, 1990: 4). The learner has to understand that he must make an effort and engage the use of proper learning strategies such as rehearsal and elaboration to ensure that the learning material is learnt in a meaningful way in order to facilitate later retrieval and use of that knowledge.
Knowledge of the self as a learner plays a very important role in how learners interact with learning tasks. A metacognitive learner strategically uses the different types of knowledge to achieve success in his learning. In a study conducted by Schommer (1990: 498) to determine the effects of beliefs about the nature of knowledge on comprehension, Schommer (1990: 500) discovered that undergraduate students who enter the university with beliefs that knowledge is simple, certain and is handed down by authorities, use such

knowledge in their studies at the university. The beliefs of the students affected how they learned.

2.4.2.2 Knowledge of the learning task

According to Brown (1980: 460), knowledge of the learning task refers to awareness of the different categories and properties of information that exist in the task and how these properties affect the learning of the task (Flavell, 1987: 22; Lloyd & Lopper, 1986: 339). Knowledge of the learning task is categorised as knowledge of the task demands (Flavell & Wellman, 1977: 15), knowing whether the task will need deliberate learning or not (Brown, 1975: 106) and knowledge of the nature of information involved in the task (Blumenfeld, Mergendoller & Swarthout, 1987: 138; Alexander & Judy, 1988: 385; Flavell, 1987: 22; 1979: 907).

Knowledge of the task demands refers to understanding that tasks have different purposes and goals (Flavell, 1987: 23). The purpose for which a task is undertaken influences the approach the learner adopts to learn that task (Pearson & Raphael, 1990: 224). For example, learning a task with the aim of presenting it verbatim makes different demands on the learner than when the learner learns the same task with the aim of presenting it in his own words.

Knowing whether a task needs deliberate learning or not is to be aware of the effort that one needs to expend on a task (Wenden 1989: 577). An example of this type of knowledge occurs when the learner decides to go over the learning task again after comprehension failure has occurred in the first attempt. The second attempt is done in a slower but more deliberate way, expending a lot of effort to ensure understanding.

Knowledge of the nature of information involved in a task entails awareness about how the information is arranged in a task (Flavell, 1979: 907), and knowing about the characteristics of different tasks (Weinstein, 1994b: 377). This type of knowledge helps the learner to approach the task strategically and in a fashion that shows that he is well

informed in order to utilise all the necessary and available options to benefit from learning that task.

Knowledge of the arrangement of the facts in a task involves among other things knowing whether the information is ample or scarce, abundant or meagre, well or poorly organised, trustworthy or untrustworthy (Flavell & Wellman, 1977: 16; Brown, 1980: 468). The learner has to be aware how the different variations in the arrangement of information, affect the task management (Flavell, 1979: 907). For example, when reading a passage densely packed with information the learner progresses slowly, taking note of each fact. On the other hand, a text that has the main facts sparsely arranged is read quickly and the learner takes note of the main ideas as he browses through the content.

Knowing the characteristics of the learning tasks involves understanding how various types of tasks are structured (Blumenfeld *et al.*, 1987: 139; Weinstein, 1994b: 376; 1994a: 267). For example, if a task demands that the learner obtains the information from a lecture or a textbook, the learner needs to understand how a lecture or a textbook is structured. The same applies to demonstrations or paper delivery. Such knowledge enables the learner to plan well before attempting the particular task (Alexander *et al.*, 1991: 329). The importance of knowledge of the learning task was confirmed by Mosenthal and Kirsch (1992: 64) in a study conducted with secondary school learners in order to determine how knowledge of the document structure affects its learning. They discovered that knowledge of document structure allows better application of cognitive steps and metacognitive strategies in document processing.

Ertmer and Newby (1996: 7) add another category to this type of knowledge as knowledge of the content which involves knowledge of the amount of prior knowledge a learner has concerning the task at hand. As indicated in paragraph 2.2.2 the existing knowledge helps to interpret new information that the learner is learning. The learner has to determine how much prior knowledge he has in store in order to learn the information at hand. Such knowledge sets the retrieval processes in motion so that information is well integrated with existing knowledge.

Knowledge of the task influences the academic achievement of learners. In a study conducted by Weinstein (1994b: 378) for the Cognitive Learning Strategies Project, "at risk" students were taught amongst other things, skills in establishing the purpose of a learning task. Learners also had to choose suitable strategies that would be used to acquire the set objectives. At the end of the study, students were tested and it was found that their performance was far above their normal performance before training (Weinstein, 1994b: 379). It was observed that training learners on how to attain knowledge of the task equips them with skills to interact more readily with the text and, therefore, leads to improved performance.

2.4.2.3 Knowledge of learning strategies

According to Myers and Paris (1978: 680), knowledge of strategies is not only the awareness about the existence of learning strategies but it also includes knowing why strategies should be applied, how they should be applied and when a particular strategy should be applied.

Flavell (1987: 23) makes a distinction between a cognitive strategy and a metacognitive strategy. A cognitive strategy is applied to attain a particular learning goal (Mann & Sabatino, 1985: 211). For example, when learning the meaning of second language words, the learner can use a mnemonic device such as the peg word method to help him learn the words and their meanings. A metacognitive strategy can be used to check whether the mnemonic strategy was successful and this can be done by asking probing questions requiring the display of acquired new words and their meanings (Alexander *et al.*, 1991: 320). Like all knowledge, knowledge of strategies is classified according to declarative, procedural and conditional knowledge (Driscol, 1994: 141; Schunk, 1991b: 181).

- ***Declarative knowledge of learning strategies***

Declarative knowledge implies what a person can declare or state as facts about something (Gagné, Yekovich & Yekovich, 1993: 60). These facts are organised collectively and are

elaborated upon in one's LTM in the form of disciplines, subjects and sections to ensure retrieval (Derry, 1990b: 20). Facts on knowledge of the self as learner and the learning task (see par. 2.4.2.1 & 2.4.2.2) are also declarative knowledge. Like knowledge of the self and knowledge of the learning task, declarative knowledge about strategies is the ability to describe a particular strategy (Chen, 1995: 183). Such knowledge enables one to describe a strategy in order to answer the question 'what' with reference to that strategy (Paris & Winograd, 1990: 32).

- ***Procedural knowledge of learning strategies***

Procedural knowledge concerns knowing how to do something and, in connection with strategies it refers to knowing how to carry out a particular strategy. (Gagné *et al.*, 1993: 59; Derry, 1990b: 22). Unlike declarative knowledge, which is stored in the form of ideas, procedural knowledge is stored as condition-action rules which are easily accessed whenever procedures are to be followed. An example of such knowledge can be knowledge on how to use a formula to solve a particular mathematical problem.

Training learners in procedural knowledge improves their learning. In a study conducted by Cardelle-Ellawar (1992: 64) the researcher investigated the effects of metacognitive mathematics instruction on the achievement of low ability sixth graders. He discovered that lack of linguistic, strategic and procedural knowledge influenced their low achievement. After learners had received metacognitive instruction that included much procedural knowledge, their achievement improved.

- ***Conditional knowledge of learning strategies***

Conditional knowledge concerns knowing when and why one has to apply knowledge (declarative and procedural knowledge). This involves making a decision when to apply a particular strategy and why (Schunk, 1991b: 180). A learner faced with failure of understanding while reading a particular text relies on conditional knowledge to be able to choose an appropriate strategy to ensure understanding. Conditional knowledge of

strategies assists learners to apply the knowledge they have (declarative and procedural) about strategies at the right time.

A study conducted by O'Malley *et al.*, (1988: 226) confirmed that knowledge of strategies improves academic achievement. One group of learners was trained in cognitive strategies, a second group was trained in metacognitive strategies, while a third group received no training. When all three groups were tested at the end of the training session it was found that the groups that received training performed better than the group that received no training. What was also remarkable was that the group that was trained in metacognitive strategies outperformed the group trained in cognitive strategies. This indicates that training learners in metacognitive strategies places them in an advantageous position to control their learning.

Spedding and Chan (1993: 91) determined the relationship between metacognitive awareness and reading comprehension in a study where they used Grade 5 learners. The researchers focussed on reading competence, word identification skills and how aware learners were of how they learn. Learners had to perform reading activities and were then asked how they learned and why they followed particular procedures. When analysing the results it was found that there was a direct relationship between metacognitive awareness and reading competence. Learners who displayed good clarity in awareness of their thinking and learning also displayed good reading comprehension. Zimmerman (1989: 330) refers to such learners as self-regulated as they are actively involved in their learning. The learner manages to be self-regulated if he displays good integration of knowledge of the self as learner, knowledge of strategies and knowledge of the learning task (Schunk, 1995: 214).

2.4.3 Metacognition as control

According to Ertmer and Newby (1996: 6), control, which is the second component of metacognition, refers to self-regulation. It is the ability to plan how a learning task should be approached, how the plan is carried out and what the evaluation of that action is

(Ormrod, 1990: 292; Ertmer & Newby, 1996: 6). This entails the methods that the learner employs to regulate, monitor and evaluate his learning (Brown, 1980: 453; Engelbrecht, 1990: 58). Brown (1987: 79) maintains that control is an effortful and strategic process governed by the executive system. The learner uses reflection to link his metacognitive knowledge and application of strategies. Reflection is the active process of relating past experiences with the action taking place at the moment (Ertmer & Newby, 1996: 16). It is also managing the process of learning progress by looking at the plans that were made before the learner embarks on learning and compare them against how the learning process is progressing at the moment, and then think about the following steps to be taken (Jones & Idol, 1990: 524). The success of the learner in controlling his learning depends on the use of metacognitive strategies (Karabenic & Collins-Eglin: 1996: 74).

2.4.4 Metacognitive strategies

Metacognitive strategies are those strategies used to monitor and regulate one's learning (Ormrod, 1990: 292). Jacob and Paris (1987: 259) categorise these strategies into three types, namely planning, monitoring and evaluation strategies.

2.4.4.1 Planning

Jacob and Paris (1987: 259) define planning as the careful pulling together of all possible ways of attaining the learning goal. This involves understanding one's personal resources (e.g. one's skills, knowledge, strengths and weaknesses), the task demands (e.g. type and length of the material to be learned), knowledge of strategies and the interaction of all three (Ertmer & Newby, 1996: 11). Such knowledge enables the learner to approach learning with a broad mind where relevant strategies are chosen and used maximally (Alexander *et al.*, 1991: 328). Strategies used for planning include, setting goals for studying, prediction, skimming and generating questions (see self-questioning) before reading the text (Pintrich, 1989: 132; Paris & Winograd, 1990: 29).

- ***Goal setting***

Setting a goal involves specifying the performance standard one needs to attain, selecting and sequencing a series of strategies or procedures for achieving the goal and identifying possible obstacles that might hinder the attainment of the goal (Ertmer & Newby, 1996: 11). How successful one sets one's goal is determined by one's aspirations and the values one holds (Weinstein, 1994b: 376).

Morgan (1985: 623) conducted a study to determine the effect of goal setting on learning. Undergraduate students were assigned to four conditions, i.e. self-monitoring of proximal goals, self-monitoring of distant goals and self-monitoring of time for study. The fourth group served as the control group. The group assigned to the proximal goal condition learned to set goals for reading and to monitor progress. The group assigned to distant goals learned to set a comprehensive goal for study and the group assigned for time for study monitoring received instructions on how to set aside time for studying. At the end of the research students were tested and the results revealed that the students assigned to the experimental conditions scored higher than the control group, irrespective of the particular aspect of training they were assigned to. When comparing the three groups that took part in the study it was also discovered that the students assigned to the proximal goal condition scored the highest marks of all the groups. Their intrinsic interest in the course was also higher than that of the students in the other two groups. The researchers concluded by indicating that setting short-term goals enhances learning as the learner receives immediate feedback on his learning.

- ***Prediction***

Prediction is a preliminary skill applied by guessing what the learning task contains before one learns it (Glendinnin & Holmstrom, 1992: 20). The learner uses cues such as pictures, topics and summaries to guess what the learning material is about and thereafter plans how to approach the learning task (Robeck & Wallace, 1990: 374). Prediction also helps the

learner to read with a purpose as reading is done to confirm or reject the prediction made (Glendinnin & Holmstrom, 1992: 20).

- ***Skimming***

Skimming is a method of reading by which a learner quickly reads through the text to obtain an overview (Usova, 1989: 49). When skimming, organisational cues such as headings, bold print, summaries, the opening and the closing paragraphs are read to give the learner an overview of the passage (Usova, 1989: 49). This enables the learner to decide whether to read intensively or not (Robeek & Wallace, 1990: 240). The learner is also helped to determine how to approach the learning material. Du Toit *et al.*, (1995: 29) refer to this assessment as surveying, previewing and reviewing.

2.4.4.2 Monitoring strategies

Monitoring strategies are used by learners to regulate and evaluate the progress they make towards attaining their learning goal (Zimmerman & Martinez-Pons, 1992a: 194). Monitoring involves an awareness of what one is doing, an understanding of where it fits into the sequence one has established and thinking ahead concerning what is to follow (Ertmer & Newby, 1996: 12). Closely related to monitoring is regulation, which is the continuous adjustment and fine tuning of one's learning and goal attainment by using cognitive, metacognitive and resource management strategies (Brown, Bransford, Ferrara & Campione, 1983: 121; Schutz, 1994: 137; Garcia, 1995: 30). The aim of such an activity is to help learners to correct their learning behaviour and get back on track if they have gone off (Pintrich & Schrauben, 1992: 162; Schunk, 1991: 292; Bonds *et al.*, 1992: 58). Weinstein and Mayer (1986: 323) regard all metacognitive strategies as comprehension monitoring strategies. Monitoring strategies include self-questioning while one reads and the checking of one's progress (Schunk, 1991b: 285).

- ***Self-questioning***

Self-questioning is a technique used to assess the processing of information before the learner starts learning (Pressley & McCormick, 1995b: 373). Irrespective of when questioning is done (before, during or after), self-questioning reveals the gaps that exist in one's knowledge so that the learning material can be revisited again to ensure understanding (Pintrich & Schrauben, 1992: 162). The learner is also helped to guard against the occurrence of an "information gap" in future (Ertmer & Newby, 1996: 12).

King (1992: 302) examined the effectiveness of self-questioning as a metacognitive strategy in a study conducted with college students. Training in study skills was provided to different groups of students over eight sessions. One group was trained in self-questioning. As part of the study, students had to apply trained skills when listening to a lecture. A week later when retention of the contents of the lecture was tested, it was found that students trained in self-questioning performed better than all the other groups.

- ***Checking***

Checking is done by stopping from time to time, looking back on what one has learned and making sure that one is still on track in moving towards a learning goal (Ormrod, 1995: 23). Checking can be done during the learning activity and also after learning has occurred (Mayer, 1988: 305). The level of one's understanding is established so that if one is not satisfied with one's progress remedial measures can be taken (Pintrich & Schrauben, 1992: 162). Strategies used for checking understanding are paraphrasing, summarising, and self-questioning.

2.4.4.3 Evaluation

Evaluation is the assessment of the task at the end of the learning period (Ertmer & Newby, 1996: 13). The learner assesses the reasonableness and accuracy of the product, determines the extent to which the learning goal has been achieved, goes over the

obstacles encountered (how well or poorly they were managed) and reconsiders whether the learning plan was the most efficient or the worst one (Ertmer & Newby, 1996: 13). The aim of evaluation is to improve future involvement on the basis of what has occurred in the present learning situation. Strategies used for evaluation are the same as those used for monitoring, however, there is a difference when they are applied. For example, when applying self-questioning for evaluation one uses it at the end of learning instead of during the learning activity. One will also ask questions relating to planning and the general effectiveness of learning instead of looking at the effect of a particular strategy.

Evaluation was applied successfully in a learning strategy programme conducted by Nunan (1996) with first-year university students over a 12-week period. Sixty students were taught learning strategies and monitoring strategies focussing on equipping them with skills to develop their knowledge, the ability to apply learning strategies, skills to assess their progress and apply language skills outside the classroom. The students were further requested to keep journals in which they reflected on what they had learnt, how they had learned, the difficulties they had encountered, and their future plans. When the study was evaluated at the end of the study period, it was observed that teaching students to reflect improves their learning. Students displayed improved performance as compared to before the strategy training and this improved performance was characterised by the independent use of learning strategies (Nunan, 1996: 41).

Metacognitive strategies such as planning, monitoring and evaluation surface later in learning strategy use. Pokay and Blumenfeld (1990: 41) confirmed this when investigating the relationship between cognitive strategies, metacognition, motivation and academic achievement. Two hundred and eighty-three high school learners were involved in the study. The focus of the study was geometry problem solving. Learners were firstly trained in problem solving strategies and in metacognitive strategies. When learners were tested at the end of the first semester, the test results indicated that the learners were only using problem-solving (cognitive) strategies. There was no indication of the use of metacognitive strategies. The study continued until the end of the second semester when

students wrote another test. The second test revealed that students were then using metacognitive strategies.

2.4.5 Resource management strategies

Resource management strategies are the strategies that learners use to control their environment and the resources available so that a climate conducive to learning prevails (Pintrich & Schrauben, 1992: 162). These strategies do not have a direct influence on learning but are general in the sense that they can aid or hamper learning (Weinstein, 1987: 593; Pintrich, 1989: 133). Schunk (1991b: 291) lists resource management strategies as time management, management of the study environment, seeking help and effort management (Karabenic & Collins-Eglin, 1996: 74).

2.4.5.1 Time management

Time management is a coping strategy that ensures that enough time is set aside for studying and learning (Pintrich, 1989: 134; McCombs & Pope, 1994: 69). The amount set aside is determined by the nature of the learning task (see paragraph 2.4.2.2), the learning goal to be attained and self-awareness (understanding own learning style, see paragraph 2.4.2.1) (Pintrich, 1989: 143). To manage one's time when learning requires that one knows whether the learning task is difficult or not, whether it is long or short and whether it contains sparse facts or has many facts densely crammed together (Pintrich, 1989: 143; Thomas & Rhower, 1986: 25). A difficult learning task needs more time than an easy one and will require more time and concentration.

Time management is also influenced by the purpose of learning (i.e. the learning goal) (Pintrich, 1989: 143). Study time set for exam preparation is not the same as the normal study period. A learner who usually studies for two hours in the evening every day will lengthen these study sessions when studying for exam by waking up early in the mornings and studying for an hour or two. This schedule will be intensified as the exam approaches.

To manage one's time the learner must combine the knowledge of the learning goal, the learning task and knowledge of oneself as a learner. Knowing that one's concentration is best in the early hours of the morning helps the learner to schedule intensive study sessions at that particular time while using other times of the day for less demanding tasks. Macan, Shanani, Dipboye and Philips (1990: 760) advise learners to identify their needs and wants, rank them according to priority and allocate the required time for each in order to manage the time factor well.

Good time management correlates very well with high academic performance. Macan *et al.*, (1990: 760) conducted a-survey in which 123 students took part. The items on the questionnaire were developed to measure the extent to which time management behaviours were used. The subjects were previously trained in time management. The survey included amongst others satisfaction, job-induced tension, behaviour pattern and performance. The analysis of the survey results indicated that high achievers managed their time well.

2.4.5.2 Management of the study environment

Managing one's study environment implies finding a quiet place away from any disturbances (Weinstein, 1987: 5920). The study place can be situated anywhere. It could be under the tree, inside a tent, in a library, in a dormitory or in any demarcated area where a learner will not be disturbed visually or auditorily (Pintrich, 1989: 134). The learner's attention must always be focused on the learning activity at all times and the chosen environment should meet this requirement so that the learning goal can be achieved (Weinstein & Mayer, 1986: 324).

2.4.5.3 Seeking help

Seeking help is a coping strategy displayed by enlisting minimum help from others (Karabenic & Sharma, 1994: 190). Paris and Newman (1990: 10) indicate that seeking help is a self-regulating strategy because high achievers are the ones who seek more help

than low achievers. Help can be requested from teachers, parents, friends or anyone knowledgeable enough to assist the learner to solve the problem (Newman & Goldin, 1990: 290; Brown, 1987: 100). A learner who asks questions benefits in several ways. Firstly, he obtains assistance, and secondly, he does not only manage to avoid disappointments, but also acquires knowledge (Newman, 1990: 71).

The correct timing for help seeking is very important. Learners benefit more from help seeking when it is enlisted as a last resort (Karabenic & Sharma, 1994: 190). After every possible attempt to complete the learning task has been explored without success, it is the right time to ask for help. For the benefit of the learner the help provided can only be that of guiding the learner to find his way out of a confusing situation and not giving him ready-made answers (Newman & Goldin, 1990: 290). An example of such help can be that of showing a student a mathematical formula using another example rather than solving that particular mathematical problem for him.

Newman and Schwager (1995: 352) observed the help-seeking behaviour of low achieving and high achieving learners in Grades 3-5. They also observed how help-seeking behaviour influences academic achievement. Observation involved monitoring help-seeking behaviours while learners solved mathematics problems. On the first and the second day learners were taught problem-solving skills and were given a chance to practice them. On the third day learners were encouraged to ask for help and were given some advice on how to go about it. The advice suggested the degree of help requested, for example, "May I have a little hint?" or "May I have a big hint?" or "How do you do it?" Analysing the findings indicated that low achievers asked questions that show despondency while high achievers asked for hints only here and there.

2.4.5.4 Effort management

Effort management is the ability to persist until a learning task has been completed (Pintrich & Schrauben, 1992: 62). Persistence is coupled with the self-control that the learner exercises to control his intention to learn, even when tasks seem difficult or boring

(Pintrich, 1989: 134). A metacognitive learner couples his effort management, study place management and help seeking when faced with difficulty (Pintrich & Schrauben, 1992: 163).

Resource management strategies do not have a direct influence on academic achievement but they support learning in a manner that makes them indispensable (Pintrich, 1989: 134). These strategies help the learner to adapt to his environment and change the environment to fit his needs so that maximum cognitive as well as metacognitive strategies can be used.

Research has also shown that a training programme that combines cognitive and metacognitive strategies training is more successful than a programme in which each group of strategies is taught separately. Montague (1992: 230) gave six learners with learning abilities instruction in either cognitive or metacognitive strategies in mathematical problem solving. He also gave them follow-up instruction combining the two. When evaluating the effect of the programme it was found that the integrated programme was more effective than a single training programme because learners learned to use strategies and develop strategy-monitoring skills side by side.

2.5 CONCLUSION

The chapter dealt with the influence of the use of learning strategies on academic achievement. Firstly, learning as a human activity was discussed and the discussion led to how information processing occurs (see paragraph 2.2.2). The processing that takes place in the memory stores indicates the involvement of learning strategies such as rehearsal, organisation and elaboration to ensure proper encoding. The learner needs to engage in these activities to support his learning. However, it became clear that learners do not automatically engage in learning strategy use. They need to be taught how to learn. As the learners use strategies they become experienced. The experiences they gain assist them to monitor, regulate and control their learning as well as becoming metacognitive learners. Hence, Andreassen and Waters (1989: 190) contend that metacognition surfaces later in the learning years after exposure to cognitive strategy use.

The three types of learning strategies, namely the cognitive, metacognitive and resource management strategies are all equally important. Metacognitive learners integrate all three types of strategies and achieve good academic results. Learning strategies and metacognition alone are not enough to produce good academic achievement. McKeachie, Pintrich and Lin (1985: 153) confirmed this finding in a study they conducted with students characterised as "at-risk" academically. The researchers observed that for those students to be self-regulated, motivation had to be included in their training programme. The next chapter deals with motivation.

CHAPTER THREE

3. THE INFLUENCE OF MOTIVATION ON ACADEMIC ACHIEVEMENT

3.1 INTRODUCTION

This chapter deals with motivation in learning and it aims at investigating how motivation influences academic achievement. The definition of motivation is dealt with in paragraph 3.2 and the discussion leads to the closer examination of motivation processes such as expectancy (paragraph 3.3), self-efficacy (paragraph 3.4) and attributions (paragraph 3.6).

3.2 DEFINITION OF MOTIVATION

Motivation is a process whereby goal-directed behaviour is initiated and sustained (Bandura, 1986: 472; Pintrich & Schunk, 1996: 4). The fact that motivation is a process rather than a product implies that it cannot be observed directly. It can only be inferred from behaviours such as persistence, choice of tasks, increased effort and learner's verbalisations like "I want to obtain an A in Biology" (Ormrod, 1995: 475; Schunk, 1996a: 284).

Goals direct and act as source of action in the learner's behaviour (Pintrich & Schunk, 1996: 4; Schunk, 1996a: 125). Learners set goals and direct their behaviour towards them (Ormrod, 1995: 474; Pintrich & Schunk, 1996: 4). Although the formation of goals may differ from one learner to the other according to experience, it is one's motivation that determines the specific goal towards which one strives (Ormrod, 1995: 474). Working towards a goal implies activity.

The activity associated with motivation can be physical or mental (Pintrich & Schunk, 1996: 4). Physical activity involves persistence, exertion of effort and other actions that

can be seen. Although mental activity is also persistent, it is cognitive in nature and cannot be seen with the naked eye. It entails activities such as one's thinking, organisation of information to facilitate encoding, rehearsal of information and planning one's activities when learning (Ormrod, 1995: 475). The learner engages in all these activities in order to attain his learning goal (Pintrich & Schunk, 1996: 5).

The involvement of activity in motivation prescribes that an activity should be initiated and sustained to a certain degree so that the learning goal can be realised (Pintrich & Schunk, 1996: 5; Ormrod, 1995: 474). Initiating working towards a goal can be very difficult as it involves committing oneself to working towards change. Unless the behaviour started is sustained, the learning goal cannot be realised (Pintrich & Schunk, 1996: 5).

According to Pintrich and Schunk (1996: 5), many major learning goals are long-term. Learners engage in study to attain degrees that take several years to complete. It is very common to hear high school learners announcing that they would like to become doctors, lawyers, nurses and teachers when they grow up. Such goals are difficult to achieve. Motivational processes such as expectancy, self-efficacy beliefs and attributions help the learner to pursue his goals no matter how long-term they may be. These motivational processes provide direction for one's learning (Bandura, 1986: 470; Robeck & Wallace, 1990: 38) and are discussed in paragraphs 3.3, 3.4 and 3.5.

3.3 EXPECTANCY

Expectancy is the individual's belief that concerns the likelihood that reinforcement will follow as a consequence of one's involvement (Schunk, 1991b: 97). The frequency, primacy and recency of the reinforcement (Weiner, 1985: 555) determine the belief. The more recent, frequent and important the reinforcement is to the learner, the higher the expectancy. High expectancy leads to high aspiration levels. Chang and Walkey (1997: 481) confirmed this in a comparative study they conducted concerning achievement and aspirations of New Zealand Chinese and European students. The study found that New

Zealand born Chinese learners have a higher level of motivation towards academic achievement than European learners do and as the result of that, they have high achievement. This was found to be due to their parents' high values and aspirations. The New Zealand Chinese-born parents instilled the same values in their children.

The expectancy construct comes from a cognitive perspective of motivation that views the learner as an active participant in his own learning (Pintrich & Schunk, 1996: 70). Early cognitive theorists used this perspective in contrast to the behavioural view of motivation that depicted a learner as the one driven by instincts, drives and habits to learn (Pintrich & Schunk, 1996: 70). The cognitive theorists believed that expectancy beliefs give direction to one's learning. They also help the learner to decide which goals to work towards and how much activity one needs to engage in, in order to pursue the learning goal (Pintrich & Schunk, 1996: 70).

Over the years the expectancy theorists stressed the various components in their theories. Lewin promulgated the level of aspiration construct (Lewin, Dembo, Festinger & Sears, 1944 in Pintrich & Schunk, 1996: 71) and Atkinson the motives – probability of success, and the incentive value construct (Atkinson, 1957 in Pintrich & Schunk, 1996: 71). A recent model of the expectancy construct is Eccles and Wigfield's expectancy-value construct presented in Figure 4 (see page 46) (Wigfield & Eccles, 1992 in Pintrich & Schunk, 1996: 77).

In this model expectancy and task value are of importance as they are regarded as predictors of achievement behaviour (Pintrich & Schunk, 1996: 77). In Figure 4 these two constructs are presented within the broken lines and this indicates that they are internal, cognitive and motivational beliefs as compared to the achievement behaviour aspects which are outside the broken lines in the figure.

The task value component refers to the reasons given by the learner when asked why a particular task is done (Pintrich & Schunk, 1996: 77). For example, when asking a Grade 12 learner who is taking Biology in the higher grade, why he chose that level, the answer

might be that it is one of the requirements for admission to the study of medicine or to a nurses' college. Such an answer indicates the value attached to what one learns. It is this value that drives the learner to attain a high level of achievement in the chosen subject.

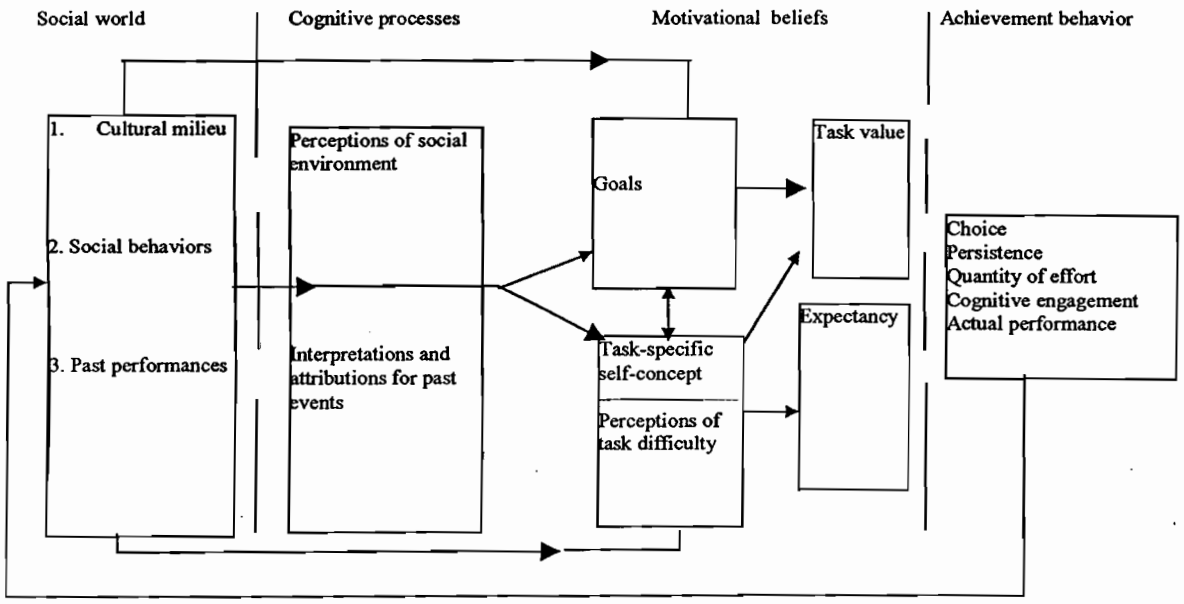

FIGURE 4. A social cognitive expectancy-value model of achievement motivation as drawn from Eccles *et al.*, (1983) (quoted in Pintrich and Schunk, 1996: 78).

The expectancy component refers to the beliefs learners have about their future expectancy for success (Pintrich & Schunk, 1996: 77). A learner may believe that he will pass in the coming exam and this belief can be measured by letting the learner predict how he will perform. Pintrich and Schunk (1996: 77) state that there are two components that play a role in expectancy, namely task-specific self-concept and perceptions of task difficulty.

Task-specific self-concept involves the learner's perceptions of his competence in the particular task. When learners are asked to guess whether they will be successful in the coming exam, they evaluate their present ability in that subject and estimate their future performance by looking at how they fare at that particular moment (Pintrich & Schunk, 1996: 77).

Task-perceptions are the learner's judgement of task difficulty (Pintrich & Schunk, 1996: 79). These perceptions are subject or section-related. Most commonly a learner who perceives English as a difficult subject has low expectations of success in the subject. Learners combine their task perceptions and their perceptions of competence to formulate their expectancy judgement. When learners judge themselves as competent in relation to a particular task they readily choose to perform the task yet when one judges oneself as less competent, one abstains from performing such a task.

The main source of motivational beliefs such as expectancy and task value is the social world as indicated in the left column of Figure 4. From the social world three categories of sources are identified, namely the cultural milieu, social behaviours and past performances. These external sources then influence one's cognitive processes and result in the formation of perceptions of one's environment and the interpretation of past events in the form of attributions. Should the external forces influence one's cognitive processes positively, the learner becomes motivated and formulates some beliefs that keep him involved in his learning. The beliefs associated with motivational behaviour are good choice of learning tasks, persistence, and exertion of effort when one is learning, engagement in learning tasks and high performance.

In a study conducted by Covington and Roberts (1994: 137) the researchers probed the profile of success-oriented students. They observed 220 undergraduates by administering the California Psychological Inventory (CPI) which assessed the well being and effective interpersonal functioning of students. The study revealed that success-oriented students have self-control, are intrinsically focused when dealing with learning tasks and have confidence in their own abilities (Covington & Roberts, 1994: 163). Success-oriented learners are highly motivated to learn. Their balanced interpersonal functioning makes them succeed in their academic engagement.

3.4 SELF-EFFICACY

3.4.1 Definition of self-efficacy

Self-efficacy is a person's judgement of his capability to organise and execute specific courses of actions required to attain a particular goal (Bandura, 1986: 88). The fact that this definition of self-efficacy includes organising and executing courses of actions indicates the important role competence and cognitive skills play in self-efficacy. Self-efficacy is a very specific judgement of one's perceived competence in a particular activity (Pintrich & Schunk, 1996: 88). For example, self-efficacy in Biology as a subject would not be merely general, but would specify the particular section one is efficient in, namely animal kingdom or plant life.

Another factor that distinguishes self-efficacy from other constructs is its situational view. Self-efficacy is used with reference to the type of goal one is involved in, in contrast with a personality or developmental trait (Pressley & McCormick, 1995a: 131). The goal is determined by an individual or by the task demands and the environment or the interaction of all three (Niedinger, 1997: 71). The implication of the inclusion of a specific goal is that self-efficacy judgements for similar tasks may differ depending on intra-individual or environmental influences the individual is exposed to (Pintrich & Schunk, 1996: 89).

Self-efficacy is the key source of learning motivation as it acts as a predictor of performance (Scott, 1991: 35, Bandura, 1993: 118, Niedinger, 1997: 71). Self-efficacy influences performance accomplishments by determining choice of behavior, thought patterns, effort expenditure and persistence (Zimmerman, Bandura & Martinez-Pons, 1992: 664; McCombs & Pope, 1994: 39; Schunk, 1996b: 5)). It also influences aspirations, strengthens goal commitment and improves analytical thinking (Bandura, Barbarelli, Caprara & Pastorelli, 1996: 1206). Associated with self-efficacy are expectations.

3.4.2 Expectations

An expectation is the individual's belief concerning the likelihood that something desirable will occur as a result of one's engagement in a particular behaviour (Schunk, 1996a: 107). The belief could be related to exam or any future event.

Bandura (1986: 123) distinguishes between two types of expectations, namely outcome expectations and efficacy expectations.

3.4.2.1 Outcome expectations

Outcome expectations are the learner's predictions that a particular behaviour will bring about a desired outcome (Bandura, 1977: 193; Schunk, 1997: 8). Outcome expectations are the personal beliefs and judgements regarding the outcome of one's involvement in learning. People formulate beliefs about what the results of their involvement will be and this is based on their experiences and observing others (models) (Driscol, 1994: 304).

Schunk (1996a: 107) indicates that at times the belief can be subjective and bear no relation to reality. Learners might believe that by enrolling in a reputable school, they will make themselves marketable for jobs, even if no learner from their previous school has ever enrolled at that reputable school before.

According to Schunk (1996a: 130), outcome expectations can refer to external events, personal standards and attitudes. An example of an outcome expectation directed towards an external event could be *If I study hard I shall get an A symbol.* An expectation directed towards a personal standard could be *If I work very hard I shall complete my degree and that will make me feel good. Who knows, perhaps I can enrol for something else again after spending such a long time on the present degree* (attitude towards studying).

Outcome expectations sustain behaviour over long periods when people believe that their involvement will result in success (Bandura, 1986: 193). Learners enrol in those courses they believe they will succeed in and they tend to avoid those in which their success is doubtful.

In a study conducted by Shell, Murphy and Bruning (1989: 91) it was found that there was a relationship between self-efficacy, outcome expectation beliefs and academic achievement. According to the results, both self-efficacy and outcome expectations accounted for a significant variance in reading and writing achievement.

3.4.2.2 Efficacy expectations

An efficacy expectation is a belief that one can be successful in executing the behaviour required to attain the designated goal (Bandura, 1977: 193). It is the person's conviction that he is capable of performing the desired behaviour and it can also be future-oriented (Niedinger, 1997: 71). When comparing efficacy expectations and outcome expectations the area of focus for each becomes evident. Outcome expectations focus on the expected outcome while efficacy expectations focus on the learner's behaviour or competence leading to a desired outcome. For example, a learner can believe that a particular form of behaviour will bring success (outcome expectation) but will have no confidence in his capability (efficacy expectation) to effect the desired behaviour (Bandura, 1977: 193). This can result in a clash of beliefs and can affect the learner's involvement in the task.

3.4.3 Sources of self-efficacy

Learners acquire information on their self-efficacy for performing tasks from enactive attainments, vicarious experiences, verbal persuasion and physiological states (Bandura, 1986: 399; Schunk, 1992: 93, Driscol, 1994: 302).

3.4.3.1 Enactive attainments

Enactive attainments refer to learning from the consequences of one's (own) actions (Schunk, 1996a: 109). This involves looking back and taking stock of how one has fared in the past. The past accomplishments then provide the learner with reliable feedback for assessing his self-efficacy (Schunk, 1991a: 93, Niedinger, 1997: 72). Successes raise perceptions of self-efficacy by conveying positive messages to the learner that he is capable of performing particular tasks. Regular failures lower one's perceptions of self-efficacy as they suggest that the learner is not capable. However, an occasional failure after a strong sense of self-efficacy has been acquired through repeated successes does not affect high self-efficacy negatively (Bandura, 1986: 399; Schunk, 1991a: 93).

Enactive attainments act as a source of self-efficacy especially when they suggest perceptions of skill improvement rather than acting as mere reflection of past performance (Schunk, 1997: 11). Schunk (1983: 89) involved third-grade learners who had problems in subtraction skills in a self-efficacy test. At the beginning of the study the learners' self-efficacy level was measured and was found to be low. Learners were then given instruction in subtraction skills. They also got the chance to practise trained skills. When the learners' self-efficacy was measured at the end of the study it was found that training in subtraction skills had improved the learners' self-efficacy.

3.4.3.2 Vicarious experiences

Vicarious experiences refer to the learner's observation of a model attaining success in a learning task (Driscol, 1994: 302). Observing peers successfully performing a learning task that one is hesitant to attempt, persuades one also to attempt such a learning task (McCombs & Pope, 1994: 57; Schunk, 1991a: 93).

There are several factors that influence learning from models. Firstly, learners are likely to be influenced and have high self-efficacy when they observe similar peers rather than

teachers performing learning tasks (Schunk, 1996a: 135). The similarity of the model's personal attributes to the learner's makes the learner accept that he too has equal potential which when used and explored properly, can make him succeed also (Schunk, 1985: 314; Driscol, 1994: 302).

Secondly, the type of model plays a very important role in the effect the model has on its observers (Bandura, 1986: 399). Driscol (1994: 302) distinguishes between mastery and coping models. A mastery model is one that is viewed as skilful in the learning task and has always remained so from the onset of learning (Bandura, 1986: 399). A coping model is one who has developed and acquired mastery of the learning task through improved effort and determination. Initially, a coping model shows fear and lack of confidence like everyone else. Mastery is then gradually acquired (Schunk, 1985: 314). Driscol (1994: 303) maintains that learners are more influenced by coping models than by mastery models.

Thirdly, the number of models observed is important (Schunk, 1996a: 134). Compared with a single model, a number of models have more effect. When learners observe a number of models there is a great probability that each one of them might find someone to model his behaviour upon.

In a study conducted by Schunk and Hanson (1985: 313), the influence of mastery and coping models on self-efficacy was observed. Seventy-two 8 to 10 year-olds who had problems in solving mathematical problems were trained in problem solving by using models. These learners also had a low level of self-efficacy (according to the results of a Pre-test). The experimental treatment involved watching videos in which teachers and peers were modelling problem solving. The results indicated that the learners had gained a lot of problem-solving skills from the models. Acquisition of problem-solving skills also improved their self-efficacy level.

3.4.3.3 Verbal persuasion

Verbal persuasion refers to convincing the learner that he is capable of achieving a high level of performance in a particular task (Driscol, 1994: 303; Bandura, 1982: 127). The aim of verbal persuasion thus is to persuade the learner to reach high levels of performance, which if regular, will result in a high level of self-efficacy perceptions.

Bandura (1986: 400) enlists several factors that govern the success of verbal persuasion as a source of self-efficacy. Firstly, the persuaded standard should be within the reach of the learner. If the persuaded standard is beyond the learner's reach, several efforts to reach the set standard might fail and this will impact negatively upon the learner's feelings of self-efficacy (Schunk, 1991a: 93).

Another factor governing verbal persuasion's success is the credibility of the persuader (Schunk, 1991b: 255). When learners are convinced that they have the capability to learn by means of a trustworthy source, they are likely to experience high levels of self-efficacy. Such feelings can move them to attempt the learning task they were hesitant to attempt before (Schunk, 1991b: 255). The persuader can be a parent, a teacher or anyone trustworthy. The onus of the persuader rests upon the fact that he understands the task demands very well. A persuader whose credibility is questioned owing to his lack of knowledge of the learning task is not trustworthy. Therefore, he is not taken seriously and his advice is disregarded (Schunk, 1991b: 255).

3.4.3.4 Physiological states

Physiological states refer to the bodily symptoms that indicate whether one is coping or not when engaged in a learning task (Schunk, 1991b: 256; Driscol, 1994: 303). Sweating and trembling may indicate that the learner is under stress and is not coping with the learning task at all (Schunk, 1991b: 256; 1992: 93). On the other hand, relaxation and less

tension may be viewed as a sign of coping with the learning task and this may result in high feelings of efficacy (Bandura, 1986: 401).

It is the learner's interpretation of the physiological states that is of significance to learning motivation (Bandura, 1986: 409). Learners rely on these bodily symptoms to judge their capabilities. Sweating and trembling while executing a learning task can have a negative effect on one's self-efficacy. The learner can conclude that she does not have the ability to perform the learning task and can, therefore, decide not to be involved in similar tasks in future. On the other hand, calmness and relaxation while others sweat reflect high self-efficacy in performing the task and this can boost future performance as other similar tasks will be approached positively (Bandura, 1986: 401).

3.4.4 Cognitive appraisal of self-efficacy information

Although factors such as vicarious experiences, enactive experiences and others act as sources of self-efficacy, the impact of self-efficacy beliefs depends on how this information is cognitively appraised (Bandura, 1986: 401). Cognitive appraisal is an inferential process in which learners weigh and combine the contributions of ability and environmental factors in order to form efficacy assessment (Schunk, 1996a: 133). To appraise one's self-efficacy the learner involves factors such as ability, the effort expended, task difficulty, the teacher's assistance and the number and pattern of successes one obtains (Bandura, 1986: 401).

Appraising one's self-efficacy depends on whether one has performed well according to ability or effort (Bandura, 1977: 201). Success with minimal effort is ascribed to ability and it usually produces high feelings of self-efficacy. On the other hand, success obtained after expending a lot of effort indicates lesser ability and, therefore, implies weaker self-efficacy perceptions (Bandura, 1977: 201).

Cognitive appraisal of the difficulty level of the task affects the effect of performance on self-efficacy (Bandura, 1986: 402). To succeed in easy tasks does not improve the individual's sense of self-efficacy whereas a high level of achievement in a demanding task increases perceptions of one's self-efficacy.

Success in a task is likely to enhance high perceptions of one's self-efficacy if it is the result of personal skill rather than external help from teachers and others (Bandura, 1977: 201). The direct involvement enables the learner to take full responsibility for his learning behaviour hence all achievement will be ascribed to personal competence rather than a shared venture.

3.4.5 Processes activated by self-efficacy

According to Bandura (1992: 10), self-efficacy beliefs regulate behaviour through four major processes, namely cognitive, motivational, affective and selection processes.

3.4.5.1 Cognitive processes

The cognitive processes activated by self-efficacy are thought patterns that can enhance or undermine performance. (Bandura, 1989: 1175; 1992: 10). A lot of learning behaviour is regulated by forethought, which consists of goal setting. Set goals guide performance until one's learning goals have been realised. Personal goal setting is guided by self-appraisal of one's capabilities in such a way that if one's perceptions of self-efficacy are strong, high and challenging goals are set. The learner also takes the responsibility and pursues the goals until fulfilment (Bandura, 1992: 10).

People's beliefs about their self-efficacy influence the type of thoughts they construct in their anticipation as they engage in a learning task (Bandura, 1992: 10). Learners with a high level of self-efficacy visualise scenarios that provide positive cues for performance.

The learner also has thoughts like "I can do it" repeatedly, while carrying out the learning task and such thoughts make him succeed. On the other hand, learners with low self-efficacy beliefs visualise scenarios that generate negative cues that are detrimental to learning (Bandura, 1992: 10).

In a study conducted by Bandura *et al.*, (1996) an investigation of how self-efficacy influences academic achievement was carried out involving 279 children aged between 11 and 14. The investigation also included the children's parents since it was believed that parents with high self-efficacy in their outlook on life instil the same beliefs in their children. A 37-item questionnaire gathered information on 7 domains, amongst them perceived self-efficacy for academic achievement and efficacy for social interaction.

The results of the investigation showed that children who perceived themselves as having a high degree of efficacy in a number of domains attained high academic levels. Such children had good social skills and handled peer pressure well (Bandura *et al.*, 1996: 1220). McKeachie (1990: 191) also maintains that self-efficacy makes learners optimise strategy selection and continue to learn. Students should consequently learn to monitor and evaluate their strategy choices in order to enhance their self-efficacy.

3.4.5.2 Motivational processes

Self-efficacy plays an important role in self-regulating motivational processes such as causal attributions (see paragraph 3.5) and outcome expectations (see par. 3.4.2.1) (Bandura, 1992: 18).

When learners give reasons for their failures and successes, the reasons are bound to be based on their perceptions of self-efficacy (Bandura, 1992: 19). If the learner has a high perception of self-efficacy the cause for failure in a particular task will be given as lack of effort and by so doing provide room for improvement. On the other hand, a learner with a

low perception of self-efficacy attributes his failures to fixed factors such as, lack of ability, and as a result motivation to improve the performance is not enhanced.

Outcome expectations are affected by self-efficacy beliefs since learners' beliefs concerning the desired outcome are based on whether the learner can perform the learning task or not (Bandura, 1992: 19). There are many activities that are worth pursuing but are not, since the learners doubt their ability to perform them.

3.4.5.3 Affective processes

Self-efficacy plays an important role in the self-regulation of affective processes. Bandura (1992: 24) and Niedinger (1997: 71) cite three ways through which self-efficacy beliefs affect the depth and variation of emotional states in learning: Firstly, self-efficacy influences the way in which emotions are interpreted and presented. Secondly, they regulate the exercise of control and thirdly, they provide courses of action that change the environment (Bandura, 1992: 24).

Perceived coping efficacy acts as a mediator of anxiety and reactions associated with stress (Bandura, 1992: 25). Learners display less anxiety and stress when they experience high self-efficacy perceptions with reference to the task they perform. Learners with low self-efficacy display anxiety and stress, which can result in learning helplessness (Niedinger, 1997: 71). Should self-efficacy be strengthened by guided mastery, the negative affective state displayed previously no longer surfaces and the learner then gains control of his emotions (Bandura, 1992: 25). A learner with high self-efficacy remains in control of his emotions even under stressful conditions because of the strong belief in his own capability.

3.4.5.4 Selection processes

Self-efficacy beliefs enable learners to influence their life and learning by selecting and creating the suitable environments they want to be in (Bandura, 1992: 30). Learners avoid situations and activities they believe exceed their capabilities. They readily choose to involve themselves in activities they believe they are capable of succeeding in. Self-efficacy can also affect the choice of career paths that the learner follows late in life (Bandura, 1992: 31). People with strong beliefs in themselves have more career options to choose from because their high self-efficacy perceptions in one sphere enable them to have confidence in their general performance. They feel confident to attempt any career.

3.5 ATTRIBUTIONS

3.5.1 Attribution theory

Attribution theory is a cognitive theory that examines attributions and their influence on human behaviour (Weiner 1974: 185). The theory suggests that a person is a conscious, rational and all-knowing being that takes decisions with the help of his internal drive. According to Pintrich and Schunk (1996: 108), the internal drive is orchestrated by two assumptions: Firstly, that an individual has a goal of understanding and mastering his environment to enable him to manage his life adequately. Secondly, an individual tries to find causal determinants of his own behaviour and that of others in order to make his life and environment controllable and more predictable. It is directly on the basis of these assumptions that attributions feature (Pintrich & Schunk, 1996a: 108).

3.5.2 Definition of attributions

Attributions are a system of beliefs about the causal explanations given for one's successes and failures and are inferred from self-evaluation of the results and consequences of behaviour (Ormrod, 1995: 498; Scott, 1991: 39; Weiner, 1985: 548).

Attributions are not necessarily the actual causes of the events but they are what an individual perceives as causes of his successes and failures (Pintrich & Schunk, 1996: 110). For example, a learner may have failed his test because of lack of hard work, but may give the reason for his failure as lack of ability. The reason he gives might have a psychological influence on his future behaviour. The attributions one assigns to one's successes and failures influence and guide one's feelings and future behaviour irrespective of whether they are the actual reasons or not.

3.5.3 Attribution process

The attribution process is the influence that environmental and personal factors have on the generation of attributions one assigns to one's success and failure (Pintrich & Schunk, 1996: 110). The environmental factors include specific information (e.g. if the teacher told Peter that he had failed because he did not study hard enough) and social norms and information like how others view Biology as a subject. Personal factors include prior beliefs the individual has about himself and the task he engages in. A learner who attributes his failure to lack of ability might combine this attribute with what he thinks of himself as a learner and some social attributes like how others fare in the subject before he gives a reason for his failure (Pintrich & Schunk, 1996: 110). It is the combination of these factors that affects the learner's future involvement in learning tasks.

3.5.4 Dimensions underlying learners' attributions

According to Weiner (1974: 186; 1985: 548), learners' attributions vary along three dimensions, namely locus, controllability and stability. It is these causal dimensions that have the psychological force to influence expectancy and the learner's self-efficacy (Pintrich & Schunk, 1996: 111).

3.5.4.1 The locus dimension

The locus dimension refers to the perceived location of a cause, whether it is within the learner or not (external) (Stipek, 1988: 82). Causes located in the learner are aptitude, effort, skill, interest, fatigue and mood. Task difficulty, help from others and luck are viewed as external causes (Driscol, 1994: 307; Pintrich & Schunk, 1996: 130).

The locus of causality dimension influences the motivation to learn (Schunk, 1991b: 249). Attributing one's failure to an internal cause like effort places the learner in a position to improve in future because the perceived cause is in the learner himself. There is understanding that one has the power to manipulate the cause and produce desirable results (Weiner, 1974: 5).

Attributing one's failure to chance, task difficulty and help from others (external causes) leaves one with no hope that an improvement will be made as causes of failure are perceived as being beyond one's control (Driscol, 1994: 306; Pintrich & Schunk, 1996: 130). Such attributions are characteristics of underachieving learners as they undervalue their effort (Rimm, 1997: 18).

3.5.4.2 The controllability dimension

The controllability dimension refers to the extent to which a learner is able to control or manage the perceived cause of failure or success (Weiner, 1979: 3; Hiebert, Winograd & Danner, 1984: 1140). Controllable causes are, for example, effort and interest as they can be managed by the learner to achieve better results. Uncontrolled causes are those that fall beyond the learner's control, for example, aptitude, task difficulty, help from others and chance (Driscol, 1994: 308; Pintrich & Schunk, 1996: 133).

Closely related to the controllability dimension is intentionality (Pintrich & Schunk, 1996: 134). Intentionality is a decision to act in a certain way. It deals with taking action

and, therefore, it cannot be classified as one of the causes (Pintrich & Schunk, 1996: 134). Weiner (1986: 98) suggests that intentionality be used as a wing of the controllability dimension although it differs slightly. For example, a learner may intentionally choose not to put too much effort into his work owing to poor judgement of the task whereas he cannot intentionally choose a wrong strategy for a particular task. His poor choice might be due to his limited knowledge of strategies. Intentionality is both controllable and uncontrollable.

In a study conducted by Vispoel and Austin (1995: 377) 211 junior secondary school learners had to rate luck, ability, task difficulty and effort against other achievement causal factors such as strategy use, interest, teacher's help and family influence. The analysis of results revealed that a large number of learners blamed themselves for their failures and they indicated lack of effort as a reason for their failure.

3.5.4.3 The stability dimension

The stability dimension refers to how constant and variable a perceived cause is, when seen across situations over time (Stipek, 1988: 82). A stable cause stays the same and is regarded as a trait of that person, whereas an unstable cause changes according to situations (Driscol, 1994: 307; Weiner, 1979: 3).

In his earlier model, Weiner (1979: 3) regarded ability as stable and effort as unstable. Owing to the fact that the use of ability has been found misleading, recent sources have made some adaptations to the naming of perceived causes (Weiner, 1986: 112). Aptitude is used in the place of ability and is regarded as stable as it is the constant internal characteristic of the individual (Weiner, 1986: 47). However, Stipek and Gralinski (1996: 402) carried out a particular study and observed that understanding aptitude as being stable did not preclude the learners from believing that effort can still have a positive effect on intelligence and performance. The use of skills is preferred to effort. Skills are

internal abilities that are learned over time and are unstable (Weiner 1986: 112). Effort, on the other hand, is regarded as being both stable and unstable depending on the type of effort involved. For example, a learner may put in more effort to succeed in a particular task and in this regard effort can be viewed as unstable. In another case a learner can continually work hard in all subjects in such a way that his performance improves. Such effort becomes stable (Pintrich & Schunk, 1996: 131).

Task difficulty (Weiner, 1979: 4) which is referred to as objective task characteristics, (Weiner 1986: 47) is regarded as external and stable. Luck has always been regarded as unstable since it is unpredictable. One can experience good luck one moment and bad luck the next. But at times when one experience good or bad luck consistently, the type of luck experienced becomes a personal trait and it could be said that "he always wins" or "he always loses". In such an instance luck can be said to be stable. However, Weiner (1986: 47) replaces luck with chance, in order to put the focus on environmental factors displayed by chance rather than the personal trait of an individual. Chance can, therefore, be said to be external and unstable.

Most of the causal attributions fit in more than one dimension which shows the interrelatedness of the three dimensions (Driscol, 1994: 307). For example effort as an internal cause is stable or unstable and it can be controlled or be uncontrollable. Chance on the other hand, is an external, unstable cause, therefore, it cannot be controlled.

Aptitude, an internal cause, cannot be controlled. It is a personality trait and like all the other causes it has implications for motivation (Stipek & Gralinski, 1996: 397). A learner who attributes his failure to aptitude is not motivated to improve his performance unless expectations are coupled with chance. On the other hand, attributing one's success to aptitude enhances one's self-esteem, as the learner becomes aware of the stable nature of aptitude and judges himself (Pintrich & Schunk, 1996: 135; Schunk, 1991b: 250).

Perceived causal attributions are expressed differently by learners of different ages, depending on what they mean to them and also depending on the type of activity a learner

involves himself in (Stipek & Gralinski, 1996: 397). Vispoel and Austin (1995:377) in a study they performed discovered that junior secondary school learners blamed themselves for their failure instead of levelling the blame on their teachers and family members when they rated causes for their failure. In another study conducted by Hiebert *et al.*,(1984: 1139) Grade 6 learners were observed. The researchers investigated the learners' conceptions of attributions in reading. Learners were assigned different reading activities such as reading aloud, comprehension tests and reading for meaning. Learners were then asked questions that allowed them to evaluate their attributions relating to the type of task they did. Analysis of the responses indicated that learners attributed all their successes to themselves while failures were ascribed to external factors.

3.5.5 How attributions influence behaviour and cognition

Attributions influence a number of aspects of behaviour and cognition including emotional reaction to success and failure, expectation for future success and failure, expenditure of effort, help-seeking behaviour, classroom performance, future choices and self-concept (Ormrod, 1995: 500).

3.5.5.1 Emotional reaction to success and failure

Students feel happy when they succeed. However, not all their successes make them proud and satisfied. Learners feel proud if their successes are perceived to be due to what they had done personally, for example, working hard. If the successes are due to another person's actions rather than their own, learners are likely to feel grateful rather than proud (Ormrod, 1995: 500).

Failure, on the other hand, brings about sadness but not always feelings of shame and guilt. When learners believe they have failed on account of internal causes like lack of ability or effort, they are bound to feel ashamed or guilty. But when failure is believed to have been caused by external causes such as other people and task difficulty, learners are likely to be angry instead of feeling guilty or ashamed (Ormrod, 1995: 501).

In a study performed by Covington and Omelich (1985: 446) the learners' emotional reactions were confirmed. The study involved undergraduate students with low self-concept. A distinction was drawn between failure-accepting and failure-avoiding students. A questionnaire describing a number of situations was administered and students had to rate themselves. When the results of the questionnaire were analysed it was confirmed that high ability students do not experience feelings of guilt. It was also found that the less competent students experienced humiliation and shame.

3.5.5.2 Expectations of success or failure

When students attribute their successes and failures to stable factors they expect their future performance to be the same (Ormrod, 1995: 501). Weiner (1986: 154) maintains that the stability dimension is closely linked to future performances. Successful students expect to succeed while failing students believe that they will always fail. When successes and failures are attributed to unstable factors their current attributions have less or no influence on the learner's future expectations (Pintrich & Schunk, 1996: 136). Students who have the highest expectations of future success are those who attribute their successes to stable causes and failures to unstable causes like effort and skill (Simpson, Licht, Wagner & Stader, 1997: 388; Vispoel & Austin, 1995: 378). Attributions can be set into motion when the unusual happens for example, an occasional failure will make the learner think about the reason why he failed so that he can do something about it (Pintrich & Schunk, 1996: 135).

3.5.5.3 Expenditure of effort

When students believe that their failure is due to lack of effort, they are bound to try harder next time because the perceived cause is internal and can change if certain conditions are met (Ormrod, 1995: 501; Weiner, 1986: 77). But if failure is attributed to lack of innate ability, the learner feels helpless to try harder because he understands that he cannot succeed no matter how much he tries. The influence of such attributes for

future performance is that the learner gives up easily and tends to fail even the tasks he has succeeded in before (Ormrod, 1995: 501).

3.5.5.4 Help-seeking behaviour

Students who believe that their success is due to their own making (internal and controllable causes) are likely to do and repeat what they did before which made them succeed (Ormrod, 1995: 502). If their success was due to the fact that they had asked for help from the teacher, then they are likely to do it again. If their success was due to attending extra classes, they are also likely to continue to attend such classes. In contrast, learners who feel their learning and success is not in their hands are likely to sit back and not enlist any help from others or attend extra classes.

3.5.5.5 Classroom performance

Students' attributions and their expectations to succeed affect their classroom performance (Ormrod, 1995: 502). Learners who attribute their failures to unstable, controllable and internal causes are likely to improve their future classroom performance because they feel that they themselves are in charge of their learning. Students who attribute their failures to external, uncontrollable and stable causes such as ability (stable – uncontrollable – internal) have low expectations of success and, therefore, cannot improve their classroom performance.

3.5.5.6 Future choices

A learner who attributes his failures to internal, unstable but controllable causes like effort chooses challenging tasks even if he has failed a similar task previously because he believes he can improve his performance. Such a student has high expectations of success in a particular task (Ormrod, 1995: 502).

3.5.5.7 Self-concept

Attributions have implications for the formation of one's self-concept since the learner whose attributions show that he does not have control over his learning, will always have a low self-concept. Attributing one's failures to controllable, unstable and internal causes indicates a high self-concept (Weiner, 1986: 234). Students develop their self-concept around their perceived school performance and perceived ability (Ormrod, 1995: 502; Simpson *et al.* 1997: 387). Students who usually succeed in their schoolwork tend to perceive themselves as having the ability to succeed. This realisation helps to develop their self-concept and results in a high sense of self-efficacy. A learner who has a history of failures develops a low perception of his ability, which leads to poor self-concept and low self-efficacy. Such a learner avoids academic tasks and never enjoys schoolwork.

3.6 THE INFLUENCE OF MOTIVATION ON ACADEMIC ACHIEVEMENT

According to Anderson and Keith (1997: 268), learner motivation is a strong predictor of academic achievement. In a study conducted among high school learners a survey was undertaken of the learners' family background, school experiences, their particular perceptions of themselves as learners, and their aspirations after Grade 12. The results indicated that all the variables explored obtained a meaningful effect size indicating learner motivation as a strong predictor of academic achievement.

Pintrich and De Groot (1990: 33) also conducted a study to determine the influence of motivation on academic achievement. One hundred and seventy-three seventh grade learners were involved in the study. Students responded to a self-report questionnaire (the Motivated Strategies for Learning Questionnaire (MSLQ)). The MSLQ contained items on motivation, cognitive skill and effort management. Learners' academic performance was also measured by using the learners' actual classroom tasks and assignments. The first and second semester marks were collected and the MSLQ was administered on both occasions.

Analysis of the results indicated that high self-efficacy correlated with high levels of cognitive strategy use in all types of tasks. However, it was also noted that self-efficacy and intrinsic value were not predictors of exam performance. These findings suggested that self-efficacy only plays a facilitative role in relation to cognitive engagement. Teaching learners cognitive strategies led to improved classroom performance, but improving learners' self-efficacy led to more use of cognitive strategies (Schunk, 1991a: 94.)

Intrinsic value was found to be more related to the use of cognitive engagement. Learners who were motivated to learn found that their schoolwork was interesting. It was also found that intrinsic value did not have a significant direct relation with achievement but it affected learners' choices concerning engagement in a task.

Pintrich and De Groot (1990) also found that test anxiety was not significantly related to the use of cognitive strategies but negatively impacted on self-efficacy and performance. The problems the learners had were found to be related to retrieval of knowledge during exams. Although learners knew the work, test anxiety interfered with their retrieval processes.

According to Schunk (1990: 8), attributions can support or tamper with self-efficacy and self-regulated learning. The use of feedback on attributions enhances self-efficacy, which leads to a high level of academic achievement. In a study conducted by Schunk (1984: 1159) the effect of feedback on attributions was focused upon. Children who lacked subtraction skills received instruction and practised solving problems over four sessions. There were four groups of learners. One group received ability feedback for success periodically, a second group received effort feedback, the third group received ability feedback during the first two sessions and effort feedback during the last two sessions. Observing the effect of the treatment at the end of training indicated that the group that had received ability feedback during the second half of the instructional programme developed higher ability attributions and self-efficacy owing to the positive feedback received on their ability to use the skills.

In another study conducted by Visser, Basson, Pedro and Swanepoel (1997: 31) the relationship between motivation and learning strategies was determined. The study involved 539 learners and data were collected by using questionnaires. The analysis of data indicated that high achievers used better learning strategies and were intrinsically more highly motivated than low-achieving learners were.

3.7 CONCLUSION

Chapter 3 focused on the influence of motivation on academic achievement. The interaction of motivation processes such as expectancy, self-efficacy and attributions enhances academic achievement. Although self-efficacy, attributions and expectancy do not directly develop academic achievement, these factors motivate and facilitate the use of learning strategies, which leads to a high level of academic achievement. Motivated learners who have high levels of self-efficacy and expectancy and who attribute their actions to controllable, internal and unstable causes attain high achievement levels in their academic tasks.

CHAPTER FOUR

4. METHOD OF RESEARCH

4.1 INTRODUCTION

This chapter deals with the empirical procedure used in the study. The aim of the study is stated in paragraph 4.2. The population and the sample used are indicated in paragraph 4.3, while the experimental design is presented in paragraph 4.4. The procedure followed in the research is discussed in paragraph 4.5 and the research instrumentation is dealt with in paragraph 4.6.

The Post-tests used in the research are stated in paragraph 4.7 and the variables used in the study are mentioned in paragraph 4.8. The statistical techniques are given attention in paragraph 4.9. and the summary is presented in paragraph 4.10.

4.2 THE AIM OF THE RESEARCH

As indicated in paragraph 1.3 the aim of the research was to determine whether there was a relationship between learning strategies and the academic achievement of Grade 8 Siswati-speaking learners in English L2.

4.3 STUDY POPULATION

The study population used for the research consisted of Grade 8 learners from an intermediate school. The school is a public school similar to the other schools with the same grades in the area. The grades in the school start from 5 and go up to Grade 9.

The reason for targeting Grade 8 for the experiment was because this grade constitutes the tenth year of the learners at school. This guarantees that the learners have had some experience in reading and using texts. Such experience would be helpful to learners when

given instruction in reading strategies. Grade 8 learners should be able to read and work with long passages and novels within a specified time.

The school had three Grade 8 classes containing 51, 52 and 56 learners respectively. The grouping of learners in these classes was not done according to learner's abilities, but according to subject streams. The groups were thus heterogeneous with relation to reading ability and academic achievement.

Although each class followed a particular stream, all three classes used English as the medium of instruction as well as taking it as one of their subjects. All three groups were therefore, suitable for the study.

Two of the intact groups (i.e. classes) were used for the study. Random cluster sampling was used to choose the experimental and control groups from the three classes. The reason for using intact groups was that the smooth running of the school would not be disturbed during the study. Normal teaching had to continue especially with the third group that was not involved.

4.4 THE EXPERIMENTAL DESIGN

The experimental design used was a non-equivalent pre-test - post-test control group quasi-experimental design.

As indicated in paragraph 4.3 two groups were used for the experiment. One group served as the experimental group (RE) and the other as the control group (RC).

The experimental design used was as follows:

Group	Pre-test	Independent Variable	Post-test	
RE	Y1	X	Y2	Y3
RC	Y1	-	-	Y3

4.5 PROCEDURE

At the beginning of 1998 the school was visited to address the headmaster and the staff on the research. A request was made to enlist the use of Grade 8 learners for the purpose of the research and permission to undertake it was granted by the headmaster.

The actual research took place in September and October 1998 over 17 days. The research was conducted over two sessions. The first session was from the 8th to the 25th of September 1998 with a few days' break in between, on which reading strategy instruction could not be given on account of the school's tight programme. The second session was conducted from the 5th to the 7th of October 1998. Between sessions the schools were closed for the September holidays. The programme for the 17 days was as follows:

Day 1	: Pre-test and the biographical questionnaire
Day 2 & 3	: Instruction in skimming
Day 4 & 5	: Instruction in predicting
Day 6 & 7	: Instruction in finding keywords
Day 8 & 9	: Instruction in finding key sentences
Day 10 & 11	: Instruction in making text maps
Day 12 &13	: Instruction in writing summaries
Day 14 &15	: Instruction in paraphrasing
Day 16	: Post-test 1 (Y 2)

Day 17 : Post-test 2 (Y3) and MSLQ

4.5.1 Pre-test (Y1)

Day 1

On Day 1 all learners in both the control and the experimental groups completed the biographical questionnaire (see paragraph 4.6.1 and Appendix A) and did the Pre-test, which consisted of a comprehension test (see paragraph 4.6.2 and Appendix B).

4.5.2 The experimental treatment

The experimental treatment consisted of instruction in reading strategies, namely skimming, predicting, finding keywords and key sentences, writing text maps, summarising and paraphrasing.

Day 2 & 3: Instruction in how to skim

On Day 2 skimming as a strategy was introduced. The session took two hours. The instruction involved the completion of worksheets to teach the following:

- The definition of skimming was given as a method for quick reading to assess the text by making use of cues such as headings, bold print, pictures, summaries and opening and the closing paragraphs of given a text.
- When is skimming used?
- Why is it used?
- How is skimming done?

On Day 3 learners were given more practice in skimming, using magazines, textbooks and other material. The session lasted for two hours.

Day 4 & 5: Instruction in how to predict

On Day 4 instruction in prediction was given. The session lasted for two hours. The instruction given focused on:

- The definition of prediction which was given in the form of guessing what the text or reading material was about before one reads, by making use of a book cover, the pictures in the book or text and other visual cues that could help one assess and decide whether to read intensively or not.
- When is prediction used?
- Why is it used?
- How is prediction applied as a strategy?

Day 5 was devoted to practising prediction as a strategy. Learners were given novels and magazines to use. Pair work and group work was encouraged so that partners could check how close peers' predictions were to what the book really was about. The session lasted for two hours.

Day 6 & 7: Instruction in how to find keywords

Day 6 was used to introduce finding keywords. The session lasted for two hours. The instruction covered the following:

- The definition of a keyword which was given as the most important word or phrase in a sentence or paragraph.
- Where is a keyword found in a sentence?
- What is its function in a sentence?
- How can a keyword be identified?

The instruction was accompanied by worksheets, which the learners answered as they were taught how to find keywords. On Day 7 learners were given more time to practise finding keywords using their literature books, text books, magazines and library books. The session lasted two hours.

Day 8 & 9: Instruction in how to find key sentences

On Day 8 instruction to find key sentences was given during a two-hour session. Instruction included the following:

- The definition of a key sentence given as the most important sentence in a paragraph.
- Where are key sentences commonly found in paragraphs?
- How is a key sentence selected from the other sentences?
- What is the link between a key sentence and the keyword?
- How do other sentences in the paragraph relate to the key sentence?

All these questions were answered using worksheets with exercises in finding key sentences.

On Day 9 learners did more exercises using their own textbooks, library books and magazines. Learners were also taught how to underline and highlight keywords and key sentences to aid their learning. The session lasted for two hours.

Day 10 & 11: Instruction in how to draw up text maps

On Day 10 text maps were attended to. The instruction aimed at illustrating:

- The definition of a text map given as firstly the identification of key sentences and their supporting ideas and the portrayal of the relationship between these sentences in a diagram.
- When are text maps used?
- What is their importance?
- How are text maps drawn up?

The session lasted for two hours.

Day 11 was devoted to more practice on how to draw up text maps using passages from textbooks and magazines.

Day 12 & 13: Instruction in writing summaries

On Day 12 learners were taught how to write summaries during a two-hour session. Instruction covered the following:

- The definition of summaries which was given as the presentation of information in fewer words without losing what the longer text states by making use of key sentences and some of their supporting ideas.
- Why summarising is an important strategy.
- How to write a summary.

Day 13 was used to give the learners more practice in writing summaries. They used passages from their textbooks and other day-to-day material. The session lasted for two hours.

Day 14 & 15: Instruction in how to paraphrase texts

Day 14 was used to introduce and deal with paraphrasing as a strategy. During a two-hour session the following aspects were dealt with:

- The definition of paraphrasing which was given as the presentation of what the text is about in one's own words.
- The importance of paraphrasing.
- When is it used?
- How is paraphrasing used?

The activities involved looking at all the passages used from Day 2 to Day 13 and paraphrasing them.

Day 15 was used to give the learners the opportunity to get more practice in paraphrasing passages from their textbooks and other day-to-day material. The session also lasted for two hours.

4.5.3 The Post-tests

Day 16 & 17

On Day 16 Post-test 1 (Y2) (see paragraph 4.7.1 and Appendix D) was written by the experimental group only because it was this group that had been trained in learning (reading) strategies.

On Day 17 both the control and the experimental groups wrote Post-test 2 (Y3) (see paragraph 4.7.2 and Appendix E) and completed the MSLQ (see paragraph 4.6.3 and Appendix D).

4.6 INSTRUMENTATION

The instruments used for the research were a biographical questionnaire (see paragraph 4.6.1 and Appendix A), the Pre-test (Y1) (see paragraph 4.6.2 and Appendix B), the Motivated Strategies for Learning Questionnaire (MSLQ) (see paragraph 4.6.3 and Appendix C), Post-test 1 (Y2) (see paragraph 4.7.1 and Appendix D) and Post-test 2 (Y3) (see paragraph 4.7.2 and Appendix E).

4.6.1 The biographical questionnaire

The biographical questionnaire consisted of 11 items. The aim of the questionnaire was to collect data on the subjects and to find out more about their learning habits especially in English as subject.

The first 3 items required subjects to give personal details such as name (1), age (2) and gender (3). Item 4 was designed to find out whether the subjects received help from their parents in their schoolwork.

Item 5 dealt with finding out how the learners viewed English as a subject. This involved indicating whether English was regarded as a difficult subject or was an easy subject for the learner.

Item 6 was designed to find out whether the learners received extra tuition in English after school hours. A professional institution or person could provide this extra tuition. Parents, peers or any other competent person could also provide such tuition.

Items 7 and 8 established what the learner's expectations were with regard to their exam mark in English. In Item 7 the learner had to indicate what mark he would be happy with (What is the mark you would like to obtain?). In Item 8 the lowest mark the subject would be happy with, had to be indicated (What is the lowest mark you would be happy with in English?).

4.6.2 The Pre-test (Y1)

The Pre-test (Y1) (see Appendix B) consisted of a passage titled "The guitar" (Ellis, Robinson & Mbhele, 1988:126). Learners had to read the passage and answer questions that tested their ability to access knowledge from the English passage.

4.6.3 The Motivation Strategies for Learning Questionnaire (MSLQ)

The MSLQ (see Appendix C) is a self-report questionnaire that consists of 44 items on learner motivation, cognitive strategy use, and metacognitive strategy use (Pintrich & De Groot, 1990: 33). To answer the questionnaire learners had to respond to a 7-point Likert Scale (1= not at all true of me to 7= very true of me). The questionnaire referred to the learners' behaviour in Grade 8. Items were adapted from different instruments used to assess the learners' motivation, cognitive strategy use, effort management and metacognitive strategy use.

Observing the motivation factors closely indicated that there were three distinct motivational factors involved, namely self-efficacy, intrinsic value and test anxiety. The Self-efficacy Scale (alpha = .89)[1] consisted of nine items regarding the competency of the learners to perform some learning activities (e.g. *"I think I will be able to use what I learn in this subject in other subjects"* (7), *"Compared with others in this class, I think I am a good learner"* (9) and *"My study skills are excellent compared with others in this class"* (16) (Pintrich & De Groot, 1990: 35)

The Intrinsic Value Scale (alpha = .87)[1] consisted of nine items, five of which dealt with intrinsic interest (e.g. *"I like what I'm learning in this class"* (5), *"It is important for me to learn what is being taught in this class"* (4) and the other four dealt with Test Anxiety (alpha= .75)[1], (e.g. *"I have an uneasy, upset feeling when I take a test"* (12), *"I worry a great deal about tests"* (20) (Pintrich & De Groot, 1990: 35).

Two cognitive scales were constructed and these covered cognitive strategy use and self-regulation. The Cognitive Strategy Use Scale (alpha = .83)[1] consisted of 13 items concerning the use of rehearsal strategies (e.g. *"When I study for a test I practice saying the important facts over and over to myself"* (34), elaboration strategies (e.g. *"When reading I try to connect the things I read about with what I already know"* (44) and organisational strategies (e.g. *"I outline the chapter in my book to help me study"* (42) (Pintrich & De Groot, 1990: 35).

The Self-regulation Scale (alpha = .74)[1] was constructed from metacognitive and effort management items. The items on metacognitive strategies, namely planning, skimming and comprehension monitoring (e.g. *"Before I begin to study I think about the things I will need to know to learn"* (35), *"I find that when the teacher is talking I think of other things and don't really listen to what is being said"* (38) were adapted from Weinstein *et al.*, (1987) and Zimmerman and Martinez-Pons (1986).

[1] Alpha levels as reported by Pintrich and De Groot (1990)

The effort management strategies were adapted from Zimmerman and Martinez-Pons (1986) and involved learners' persistence when learning during difficult or trying times (e.g. *"I always try to understand what the teacher says even if it does not make sense"* (29), *"I work hard to get a good mark even when I don't like the class"* (43).

4.7 THE POST-TEST

The Post-test consisted of two tests. The experimental group wrote both tests (Y2 and Y3) whereas the control group wrote one of the tests (Y3). The experimental group had to complete both tests because they had undergone training in reading strategies while the control group did their normal work. The researcher wanted to assess whether reading strategies training was effective.

4.7.1 Post-test 1 (Y2)

Post-test 1 (Y2) was the first test written at the end of the experimental treatment and was done by the experimental group only. The aim of the test was to assess whether the learners had mastered the application of the trained strategies. The control group was not given this test, as it had not been trained to use reading strategies.

Post-test 1 (Y2) consisted of three sections. The first section tested skimming. It consisted of a passage titled "The Renaissance" (Cretchley & Stacey, 1983: 93). Learners had to skim through it over a stipulated time and then answer questions on the passage. Questions asked probed whether learners had managed to obtain an overview of the passage without intensive reading.

The second section aimed at testing the learners' prediction skills. The section consisted of a set of photocopied pictures from a novel "The house on the hill" (Laird, 1992: 2) which the learners had never read before. The first picture was that of a book cover consisting of the front and the back part of the book. The other four pictures were taken from different sections of the book and placed in such a way that they showed the

progress of the story. The questions asked required learners to use the pictures and guess what the story was about. Answers had to indicate that the learner had used his/her imagination and obtained clues from the book title, the blurb and the pictures.

The third section focused on testing the ability of finding keywords and key sentences, text mapping, summarising and paraphrasing. The section consisted of a passage titled 'Musical instruments' (Cretchley & Stacey, 1983: 206), which the learners had to read with understanding and answer questions afterwards. As indicated above, only the experimental group wrote this test and the reason for this was to test whether learners could display the use of trained learning strategies.

4.7.2 Post-test 2 (Y3)

The second test consisted of a comprehension test titled "The future of the sea" (Ellis, *et al.*, 1988: 90) and was written by both the experimental and the control group. The aim of the test was to assess whether learners trained in learning strategies could use the strategies spontaneously and independently to aid their learning. If learners did use the strategies, the test would also assess whether the used learning strategies did improve the learners' performance in English. Post-test 2 (Y3) used variables such as factual knowledge, general knowledge and correct use of English.

4.8 VARIABLES USED IN THE STUDY

4.8.1 Independent variables

- Skimming ability
- Prediction ability
- Ability to identify keywords
- Ability to identify key sentences
- Summarising ability
- Paraphrasing ability

- Ability to write text maps
- Age
- Gender
- Self-efficacy
- Motivation
- Attitude
- Intrinsic value
- Effort management

4.8.2 Dependent variables

The academic achievement in English L2 defined as performance in the comprehension test.

4.9 STATISTICAL PROCEDURES AND TECHNIQUES

The data were processed by using computer facilities of the PU for CHE. Independent t-tests were performed with the TEST procedure of SAS (SAS INSTITUTE CARY, NC, USA, 1996). An effect size (d) was calculated to determine the practical significance between two independent groups as follows:

$$d = \frac{X_1 - X_2}{S}$$

Where

d = effect size

X_1 = mean of group 1

X_2 = mean of group 2

S = standard deviation

If d = 0,2 small effect size

d = 0,5 medium effect size

d = 0,8 large effect size

If $d \geq 0,8$ then the difference between means is practically significant.

A multiple regression analysis was performed to determine the collective and individual influence of the independent variables on the dependent variable. The Statistica's Multiple Regression analysis computer program (STATISTICA, 1988) was used for the calculation of the multiple regression analysis. Multiple regression analysis is a method for analysing the collective and separate contributions of two or more independent variables (Kerlinger & Pedhazur, 1973: 3). Multiple regression was found to be an appropriate procedure to use in this research so that the collective and separate contributions of learning strategies and self-efficacy on academic achievement in English could be determined.

An effect size (f^2) was calculated to determine the practical significance of the multiple regression. The following formula was used:

$$f^2 = \frac{\text{contribution to } R^2}{1 - R^2}$$

Contribution to R^2 can be defined as the difference between R^2 and the R^2 value of a particular variable.

$f^2 = 0{,}02$ small effect size
$= 0{,}15$ medium effect size
$= 0{,}35$ large effect size

If $f^2 \geq 0{,}35$ then the contribution of the particular variable is of practical significance (Cohen, 1977).

4.10 SUMMARY

The chapter dealt with the procedure and the method followed when conducting research to determine whether learning strategies influence academic achievement. All the steps of the research as stated from 4.1 to 4.9 were followed as mentioned. The statistical analysis follows below.

CHAPTER 5

5. STATISTICAL ANALYSES AND INTERPRETATION OF RESULTS

5.1 INTRODUCTION

As mentioned in paragraph 1.3, the aim of this study was to determine whether there was a relationship between learning strategies and the academic achievement of Grade 8 Siswati-speaking learners in English L2. The hypothesis to attain this goal is found in paragraph 5.2.

Descriptive statistics for each variable were calculated and presented in Table 5.1. The variables used in the analyses are explained in paragraph 5.3. Paragraph 5.5 explains the different tests used in the experimental design. In paragraph 5.6 the relationship between the basic set of variables and academic achievement is explained while the relationship between reading strategies and academic achievement is explained in paragraph 5.7. In paragraph 5.8 the performance of the experimental group and the control group in English is compared. Paragraph 5.9 explains the difference between the means of the scores in the Pre-test (Y1), Post-test 1 (Y2) and Post-test 2 (Y3) in the experimental group while paragraph 5.10 compares the difference between the Pre-test (Y1) and Post-test 1 (Y2) in the experimental group. Paragraph 5.11 explains the difference between the Pre-test (Y1) and Post-test 2 (Y3) in the experimental group while paragraph 5.12 explains the difference between the scores of the Pre-test (Y1) and Post-test 2 (Y3) in the control group. The chapter is concluded in paragraph 5.13.

5.2 HYPOTHESIS

The following hypothesis was investigated in this research:

There is a relationship between the use of learning strategies and the academic achievement of Grade 8 Siswati-speaking learners in English L2.

5.3 THE VARIABLES USED IN THE ANALYSES

Two sets of variables were used in the analyses - a basic plus an experimental set of variables.

5.3.1 The basic set of variables

The following variables constituted the basic set: age, gender, encouragement to study, English as a difficult subject, extra class, goal setting, satisfaction with performance, prior achievement, self-efficacy, intrinsic value, test anxiety, strategy use and self-regulation. The basic set of variables was relevant to both the experimental and the control group.

5.3.2 The experimental variables

The experimental variables constituted the following learning/reading strategies: skimming, prediction and ability to identify keywords. In this study the learning strategies were defined as skimming, prediction and ability to identify keywords (see paragraph 2.3.1). Ability to identify keywords was a composite variable, which was composed of ability to identify keywords and key sentences, text mapping, making summaries and paraphrasing. These variables were grouped together, as ability to identify keywords is a prerequisite for identifying key sentences, writing text maps, making summaries and paraphrasing.

5.4 SUMMARY STATISTICS

The summary statistics for each variable were first calculated (see Table 5.1).

TABLE 5.1 Summary statistics for variables in the basic set of variables and the experimental variables

Variable	Number	Means	Standard Deviation	Minimum	Maximum
Age	43 (51)	13,9 (14,5)	1,4 (1,6)	12 (12)	17 (18)
Gender	43 (51)				
Encouragement to study	43 (50)	1,6 (1,8)	0,5 (0,4)	1 (1)	2 (2)
English a difficult subject	43 (51)	2,3 (2,5)	0,6 (0,9)	1 (1)	4 (4)
Extra class	43 (51)	1,2 (1,2)	1,2 (1,2)	1(1)	2 (1,2)
Goal setting	42 (51)	69,3 (33,0)	12,7 (4,3)	33,5 (22,5)	98,5 (44)
Satisfaction	43 (51)	1,4 (1,5)	0,5 (0,5)	1 (1)	2 (2)
Prior achievement	43 (51)	29,7 (27,2)	8,4 (7,2)	16 (10)	59 (42)
Self-efficacy	46 (51)	4,8 (4,5)	0,7 (0,8)	3,7 (2,6)	6,6 (6,8)
Intrinsic value	46 (51)	5,5 (5,0)	0,6 (0,7)	4,2 (2,8)	6,7 (6,1)
Test anxiety	46 (51)	3,7 (4,4)	0,9 (0,8)	1,5 (3)	5,8 (6,5)
Strategy use	46 (51)	4,7 (4,5)	0,5 (0,5)	3,6 (3,7)	5,8 (5,7)
Self-regulation	46 (51)	4,8 (4,4)	0,7 (0,5)	3,2 (3,2)	6,2 (5,7)
Skimming	45 (-)	2,6 (-)	2,6 (-)	2 (-)	12 (-)
Prediction	45 (-)	3,6 (-)	3,6 (-)	2 (-)	16 (-)
Keywords	45 (-)	7,9 (-)	7,9 (-)	1 (-)	38 (-)

Key: Statistics in parenthesis are those of the control group.

5.5 EXPLANATION OF THE DIFFERENT TESTS USED IN THE EXPERIMENTAL DESIGN TO INVESTIGATE THE HYPOTHESIS

5.5.1 Pre-test (Y1)

The Pre-test (Y1) was administered to both the experimental and the control group to determine baseline information on whether the two groups were of more or less on the same level of achievement in English L2. The variable investigated was the ability to access information from an English passage.

5.5.2 Post-test 1 (Y2)

Post-test 1 (Y2) was administered to the experimental group only in order to assess whether the group had grasped the instruction concerning the different learning (reading) strategies.

The variables used in this test were skimming, prediction and ability to identify keywords.

5.5.3 Post-test 2 (Y3)

Post-test 2 (Y3) was administered to both the control and the experimental group. The aim of the test was to determine whether instructing learners in learning (reading) strategies improves their academic performance in English L2.

The variables investigated were the ability to understand factual knowledge, a reasonable level of English that makes access of information from a passage possible, general knowledge of English and using English as a language. It was also expected that trained learners would automatically use trained learning strategies to aid their learning.

5.6 *THE RELATIONSHIP BETWEEN THE BASIC SET OF VARIABLES AND ACADEMIC ACHIEVEMENT IN ENGLISH*

The collective contribution of the basic set of variables as well as the individual contribution of each variable was first calculated (see Table 5.2 and 5.3). Multiple regression analyses were performed to determine what the influence of the basic set of variables was on academic achievement in English.

With reference to the control group (see Table 5.2), it can be inferred that the basic set of variables explains 41,50 percent ($R^2 = 0,4150$) of the variance in academic performance in English. An analysis of Table 5.2 reveals that no individual variable made a statistically significant contribution to academic achievement in English ($p > 0,05$).

TABLE 5.2 The collective and individual contribution of the basic set of variables to R^2. Criterion: academic achievement in English (control group)

$R^2 = 0,4150$ ($R^2_a = 0,1107$); Cp = 14,00

Variables	Contribution to R^2	F-value	p-level
Self-efficacy	0,0257	1,10	0,30
Intrinsic value	0,0593	2,54	0,12
Test anxiety	0,0092	0,40	0,53
Strategy use	0,0060	0,15	0,70
Self-regulation	0,0323	0,14	0,71
Age	0,0113	0,48	0,49
Gender	0,0424	0,63	0,43
Encouragement to study	0,0423	1,81	0,19
English a difficult subject	0,0543	2,32	0,14
Extra classes	0,0045	0,19	0,66
Satisfaction with performance	0,0033	0,14	0,70
Prior achievement	0,0027	0,1 2	0,73
Goal setting	0,0162	0,70	0,41

With reference to the experimental group (Table 5.3), it can be inferred that the basic set of variables explains 48,63 percent ($R^2 = 0,4863$) of the variance in academic achievement in English. An analysis of the table reveals that self-efficacy is the only variable that makes a statistically significant contribution to English. Self-efficacy explains 31,81

percent (contribution to R^2 = 0,3181; p< 0,03; f^2 = 0,06) of the variance in academic achievement in English. Its effect size (f^2), however, is 0,06 implying that the influence of self-efficacy is not of practical significance.

TABLE 5.3 The collective and individual contribution of the basic set of variables to R^2. Criterion: academic achievement in English (experimental group)

R^2= 0,4863 (R^2_a = 0,2081); Cp: 14,00

Variables	Contribution to R^2	F-value	p-value	Effect size f^2
Self-efficacy	0,3181	5,55	0,03 *	0,06
Intrinsic value	0,0594	1,15	0,29	
Test anxiety	0,0241	0,65	0,43	
Strategy use	0,0068	0,09	0,76	
Self-regulation	0,0902	1,79	0,19	
Age	0,0280	0,97	0,34	
Gender	0,0215	0,63	0,44	
Encouragement to study	0,0050	0,17	0,68	
English a difficult subject	0,0280	0,65	0,43	
Extra classes	0,0019	0,08	0,78	
Satisfaction with performance	0,0212	0,42	0,52	
Prior achievement	0,0398	0,49	0,49	
Goal setting	0,0163	0,24	0,63	

* $p < 0,05$

** $p < 0,01$

Small effect: f^2 = 0,02

° Medium effect: f^2 = 0,15

°° Large effect: f^2 = 0,35

No effect sizes were calculated where p-levels were not of statistical significance.

5.7 THE RELATION BETWEEN READING STRATEGIES AND ACADEMIC ACHIEVEMENT

An analysis of Table 5.4 which consists of the basic set of variables plus the experimental variables reveals that the basic set of variables, together with the experimental variables, explains 96,62 percent ($R^2 = 0,9662$) of the variance in academic achievement in English. The multiple regression analysis indicated that there is a relationship between the experimental variables (skimming, prediction and ability to identify keywords) and academic achievement in English. The identification of keywords has the largest influence on academic achievement in English as it explains 21,36 percent (contribution to $R^2 = 0,2136$; $p< 0,00$; $f^2 = 6,32$) of the variance in academic achievement in English. Its effect size of 6,32 is of practical significance.

Skimming as a reading strategy has the second largest influence on academic achievement in English. Skimming explains 3,49 percent (contribution to $R^2= 0,0326$; $p < 0,01$; $f^2 = 1,03$) of the variance in academic achievement in English. Its effect size ($f^2 = 1,03$) is large implying that the influence of skimming on academic achievement in English is of practical significance.

Further analysis of Table 5.4 indicates that prediction explains 3,26 percent (contribution to $R^2 = 0,0326$, $p < 0,01$; $f^2= 0,96$) of the variance of academic achievement in English. The effect size of prediction ($f^2 = 0,96$) is large indicating that prediction's influence on academic achievement in English is of practical significance.

Another variable that is of importance in academic achievement is test anxiety. Although test anxiety contributes 1,1 percent (contribution to $R^2 = 0,011$; $p <0,05$; $f^2 = 0,33$) of the variance in academic achievement in English. The effect size is 0,33 and therefore not practically significant.

The variable English as a difficult subject explains 0,83 percent (contribution to $R^2 = 0,0083$; $p < 0,04$; $f^2 = 0,25$) of the variance in academic achievement in English. The

effect size (f^2 = 0,25) is of medium effect suggesting that the learners' views on whether English is a difficult subject or not to them is not of practical significance.

From Table 5.4 it can, therefore, be concluded that identifying keywords, skimming and prediction (i.e. learning strategies) are good predictors of academic achievement in English. The hypothesis that there is a relationship between learning strategies and academic achievement in English can, therefore, be tentatively accepted.

TABLE 5.4 The collective and individual contribution of the basic set of variables plus the experimental variables to R^2. Criterion: academic achievement in English (experimental group)
R^2 = 0,9662 (R^2_a = 0,9392); Cp: 17,00

Variables	Contribution to R^2	F-value	p-level	Effect size f^2
Self-efficacy	0,0024	1,44	0,24	
Intrinsic value	0,0006	0,34	0,57	
Test anxiety	0,0110	6,53	0,02*	0,33°
Strategy use	0.0011	0,67	0,42	
Self-regulation	0,0052	3,09	0,09	
Age	0,0000	3,27	0,09	
Gender	0,0000	0,02	0,90	
Skimming	0,0349	20,62	0,00**	1,03 °°
Prediction	0,0326	19,30	0,00**	0,96 °°
Keywords	0,2136	126,38	0,00**	6,32 °°
Encouragement to study	0,0003	0,15	0,70	
English a difficult	0,0083	4,89	0,04*	0,25 °
subject	0,0009	0,52	0,48	
Extra classes	0,0010	0,64	0,43	
Satisfaction	0,0000	0,00	0,98	
Prior achievement	0,0000	0,03	0,86	
Goal setting				

* $p < 0,05$
** $p < 0,01$

Small effect: f^2 = 0,02
° Medium effect: f^2 = 0,15
°° Large effect: f^2 = 0,35

5.8 COMPARISON BETWEEN THE EXPERIMENTAL GROUP AND THE CONTROL GROUP IN ENGLISH PERFORMANCE

5.8.1 Pre-test (Y1)

To determine the equivalence of the experimental group and the control group a two-sample t-test was calculated (see Table 5.5). From Table 5.5 it can be inferred that the means of the scores of the two groups are not equal as the control group has a mean of 9,04 and the experimental group has a mean of 15,98. Although the two groups differ statistically significantly from each other (p = 0,00) the effect size (0,68) is of medium effect and, therefore, the difference between the two groups is not of practical significance.

TABLE 5.5 The difference between the control group and the experimental group Variable: Pre-test (Y1)

Group	N	Means	Standard deviation	t-value	p-value	Effect size (d)
Control	46	9,04	4,64	-4,05	0,00	0,68
Experimental	42	15,98	10,17			

Small effect: d = 0,2
Medium effect: d = 0,5
Large effect: d = 0,8

5.8.2 Post-test 2 (Y3)

The data in Table 5.6 were also calculated by using a two-sample t-test. This comparison aimed at determining the difference between the control group and the experimental group in Post-test 2 (Y3). The groups differ statistically significantly from each other (p = 0,01). An effect size of 0,61 which is of medium size was then obtained and, therefore, indicated that the difference was not practically significant. The two groups, therefore, did not differ practically significantly. In the light of the analyses of Table 5.5 and 5.6 it can, therefore,

be concluded that the two groups used for the research tend to be equal in their level of English competence.

TABLE 5.6 The difference between the control group and the experimental group Variable: Post-test 2 (Y3)

Group	N	Mean	Standard deviation	t-value	p-value	Effect size (d)
Control	46	11,60	7,51	-2,57	0,01	0,61
Experimental	42	15,77	7,71			

Small effect: d = 0,2
Medium effect: d = 0,5
Large effect: d = 0,8

5.9 *THE DIFFERENCE BETWEEN THE MEAN OF THE SCORES IN THE PRE-TEST (Y1), POST-TEST 1 (Y2) AND POST-TEST 2 (Y3) OF THE EXPERIMENTAL GROUP*

With reference to Table 5.7 the means of the scores in the Pre-test (Y1), Post-test 1 (Y2) and Post-test 2 (Y3) vary. The mean of the scores in Post-test 2 (Y3) is the smallest of all the means at 15,77, followed by the mean of the scores in the Pre-test (Y1) at 15,98. The mean of the scores in Post-test 1 (Y2) is the largest at 18,93.

A comparison between the mean of the scores in the Pre-test (15,98) with the mean of the scores in Post-test 2 (Y3) indicates that the learners scored slightly lower in Post-test 2 (Y3) than in the Pre-test (Y1). The reason for this difference could be related to the content of the passages and the appeal of such to learners. The Pre-test (Y1) passage dealt with the different types of guitars, their varying structures and the type of music that each type is used for. The passage given for Post-test 2 (Y3) dealt with the future of the sea,

indicating the resourcefulness of the sea and the threats facing it. It is possible that the learners related more to the passage on the guitar than to the one on the sea, since the topic of the sea is more environmentally related and this might have influenced the high mean in the performance of the Pre-test (Y1).

The highest mean of 18,93 obtained for Post-test 1 (Y2) could be due to the influence of the strategy training programme as well as the nature of the learning task that was given to the learners to perform. Learners were given instructions to apply the learning (reading) strategies that were trained using the passages and texts given. The high mean of scores obtained can be interpreted as an indication that the learners did grasp the instruction concerning how the taught strategies should be applied. This also indicates that learning strategies can be taught and when applied they do influence academic achievement.

TABLE 5.7 The mean score of the Pre-test (Y1), Post-test 1 (Y2) and Post-test 2 (Y3) of the experimental group

Variable	N	Mean	Standard deviation	Minimum	Maximum
Pre-test (Y1)	42	15,98	10,17	2,00	45,00
Post-test 1 (Y2)	42	18,93	7,58	4,14	36,71
Post-test 2 (Y3)	42	15,77	7,71	4,51	39,60

5.10 A COMPARISON BETWEEN THE PRE-TEST (Y1) AND POST-TEST 1 (Y2) IN THE EXPERIMENTAL GROUP

To compare the performance of the experimental group in the Pre-test (Y1) and in Post-test 1 (Y2) a paired t-test was carried out. Although the means of the two tests (Table 5.7) indicated a difference in the two tests, the analysis of the test results indicated that there

was no statistically significant difference between the two tests as the value of 0,13 ($p > 0,05$) was registered. No effect sizes were calculated.

TABLE 5.8 The difference between the Pre-test (Y1) and Post-test 1 (Y2) in the experimental group

N	Difference between means	Standard Deviation	t-value	Prob> | T |	Effect size (d)
42	-2,96	12,35	-1,55	0,13	

5.11 THE DIFFERENCE BETWEEN THE PRE-TEST (Y1) AND POST-TEST 2 (Y3) (EXPERIMENTAL GROUP)

To determine whether there was a difference between the scores of the Pre-test (Y1) and Post-test 2 (Y3) in the experimental group a paired t-test was carried out. From Table 5.9 it can be inferred that with a p-value of 0,9 there was no statistically significant difference between the performance of the experimental group in the Pre-test (Y1) and Post-test 2 (Y3).

TABLE 5.9 The difference between the Pre-test (Y1) and Post-test 2 (Y3) in the experimental group

N	Difference between means	t-value	Prob> | T |
42	0,20	10,08	0,90

With reference to Tables 5.7, 5.8 and 5.9 it can be concluded that there was statistically no significant difference between firstly, the Pre-test (Y1) and Post-test 1 (Y2) and, secondly, between the Pre-test (Y1) and Post-test 2 (Y3). Closer scrutiny of the tests

provided for the experiment indicated some limitations that might have made the tests incomparable. The tests had been of different structures and objectives. These structural differences suggest that the research benefited most when the tests were viewed in isolation rather than in a comparative form.

The Pre-test (Y1) (an ordinary passage titled 'The guitar') was given to establish the extent to which learners could work with English passages. It tested whether learners could access information from texts.

Post-test 1 (Y2) was administered to assess whether learners could display some knowledge of how to apply the trained strategies such as skimming, prediction and finding keywords. Post-test 2 (Y3) was administered for the purpose of assessing whether trained learners had acquired independent use of learning strategies in such a way that they could use learning strategies in everyday learning without being told to do so. It became clear that such independent use of strategies could not have been acquired over the 17 days used for the experiment. It takes much time, some consistency and a lot of monitoring for such behaviour to be inculcated.

However, this lack of difference should not be interpreted as failure for learners to use learning strategies or that learning strategies had no influence on the learners' academic achievement. The result of Post-test 1 (Y2) (see Table 5.4) indicated that learners could apply the learning strategies, which according to the research analysis contributed significantly to the learners' academic achievement. It can, therefore, be concluded that learning strategies do influence academic achievement.

5.12 THE DIFFERENCE BETWEEN THE SCORES OF THE PRE-TEST (Y1) AND THE SCORES OF POST-TEST 2 (Y3) IN THE CONTROL GROUP

To determine whether there was a difference between the Pre-test (Y1) and Post-test 2 (Y3) scores in the control group, a paired t-test was carried out. From Table 5.11 it can be inferred that a p-value of 0,04 ($p < 0,05$) indicates that there is a statistically significant

difference between the Pre-test (Y1) and Post-test 2 (Y3) in the control group. This difference however, is not of practical significance since the effect size is 0,31 which is small. It could therefore be concluded that there was no difference between the performance of the control group in the Pre-test (Y1) and in Post-test 2 (Y3).

TABLE 5.10 The means for the Pre-test (Y1) and Post-test 2 (Y3) in the control group

Variable	N	Mean	Standard deviation	Minimum	Maximum
Pre-test (Y1)	46	9,04	4,64	2,00	20,00
Post-test 2 (Y3)	46	11,60	7,51	1,80	42,30

TABLE 5.11 The difference between the Pre-test (Y1) and Post-test 2 (Y3) in the control group

N	Difference between means	Standard deviation	t-value	Pro > | T |	Effect size (d)
46	-2,56	8,26	-2,10	0,04	0,31

5.13 CONCLUSION

The results of the two-sample t-test calculated to determine the equivalence of the control group and the experimental group in the research indicated that the two groups differed statistically significantly from one another but with the effect size of 0,68 which has a

medium value, the difference was found to be of no practical significance. It was therefore concluded that the two groups used in the research had equivalent levels of achievement in English.

Although the comparison of the results of Post-test 2 (Y3) indicated that there was statistically no difference between the performance of the control group and the experimental group, the higher mean obtained by the experimental group indicated a better performance of the experimental group than that of the control group. The better performance was attributed to the learning strategy training received by the experimental group. It was then concluded that learning strategies can be taught to learners and when learners use strategies, learning strategies do influence academic performance.

The results of the multiple regression analysis performed to determine how the different variables of the basic set contributed to the variance in academic performance in English of the control group indicated that there was no specific variable that made a statistically significant contribution to academic achievement. Whereas, the results of the multiple regression analysis carried out on the experimental group indicated that the learning strategies skimming, prediction and identifying keywords are good predictors of academic achievement in English. The hypothesis that there is a relationship between learning strategies and academic achievement was therefore tentatively accepted.

CHAPTER SIX

6. SUMMARY AND CONCLUSION

6.1 INTRODUCTION

This chapter consists of a summary of the research. A statement of the problem is presented in paragraph 6.2. The literature review is summarised in paragraph 6.3 and is followed by a discussion of the method of research in paragraph 6.4. The procedure according to which the research was conducted is discussed in paragraph 6.5. The results of the research appear in paragraph 6.6 and the conclusion is drawn in paragraph 6.7. The limitations of the study are discussed in paragraph 6.8 and the recommendations are presented in paragraph 6.9. The chapter is then concluded with brief remarks on the whole research in paragraph 6.10.

6.2 THE STATEMENT OF THE PROBLEM

The high failure rate in English of Grade 8 Siswati-speaking learners in the Badplaas Circuit, a region in the province of Mpumalanga, has resulted in the development of a negative attitude towards English amongst learners as they regard the subject as difficult.

There are some learners who are motivated to learn but they constitute only a small percentage when compared to those who lack motivation. These motivated learners choose challenging tasks and they engage in learning with enthusiasm. They do this intuitively without knowing the variables that influence high achievement. Learners, both achievers and non-achievers though, need to be made aware of the different learning strategies and how they can be applied in order to improve one's academic achievement.

The aim of the research was, therefore, to determine whether learning strategies had an influence on the academic achievement of Grade 8 Siswati-speaking learners in English

L2.

6.3 REVIEW OF LITERATURE

6.3.1 The relationship between learning strategies and academic achievement

Learning strategies are defined as a series of deliberate behaviours, thoughts and actions that the learner engages in during learning to influence the encoding process (Wittrock, 1986: 310; Schunk, 1991b: 282). The use of learning strategies influences the learners' engagement in learning tasks. Nunan (1996: 41) found that training learners in learning strategies and in monitoring their own learning, makes them good processors of information and leads to high levels of achievement. Jacob and Paris (1987: 264) believe that training learners in metacognitive strategies such as planning, monitoring and self-regulation increases the learners' use of cognitive strategies. Good management of resources such as time and study environment supports learning and provides an atmosphere conducive to learning so that the learner is able to use cognitive and metacognitive strategies successfully to achieve high performance (Macan, *et al.*, 1990: 760).

6.3.2 The relationship between motivation and academic achievement

Motivation (see paragraph 3.2.) is defined as a process whereby goal-directed behaviour is initiated and sustained (Bandura, 1986: 472). Motivation processes involved in student learning are expectancy, self-efficacy and attributions (Pintrich & Schunk, 1996: 4; Pintrich & De Groot, 1990: 33).

Expectancy (see paragraph 3.3.) which is defined as the belief learners have about their future expectancy of success predicts learning behaviour (Pintrich & Schunk, 1996: 77). Task-specific self-concept and task perceptions determine judgements of expectancy. A learner who regards himself as less competent in a particular task does not involve himself in that particular task. Instead he chooses another task that he can succeed in.

Self-efficacy regulates the other motivation processes such as attributions, expectations and cognized goals (Bandura, 1992: 18). A high self-efficacious learner attributes his failures to factors from within himself like lack of effort so that he stays in control of his learning. Such a learner generates positive thinking, coupled with good use of cognitive and metacognitive strategies that lead to success.

Attributions that are defined as the system of beliefs one holds about the reasons one gives for one's failures and successes, influence learning behaviour (Scott, 1991: 39; Weiner, 1985: 548). Learners state a number of reasons for their failures, namely lack of aptitude, effort, task difficulty and luck. The type of attributions one mentions for failure determines whether one hopes to succeed in future or not. Pintrich and Schunk (1996: 135) believe that a learner who perceives lack of aptitude as a reason for his failure has no hope of improving his academic achievement, as aptitude is fixed and stable. The learner accepts that he is a failure. Attributing one's failure to an unstable but controllable factor like effort indicates one's hope that the performance can be improved with added effort and other changes in one's approach to the learning task (Ormrod, 1995: 501).

Motivated learners choose to be involved in learning tasks. They choose suitable cognitive strategies and regulate their learning by using metacognitive strategies and resource management strategies. Good strategy use results in high academic achievement (Zimmerman, 1989: 330).

6.4 METHOD OF RESEARCH

6.4.1 Subjects

One hundred and fifty-nine Grade 8 learners, from an intermediate school in the Badplaas Circuit in the province of Mpumalanga constituted the population for the study. The learners used were from three classes of the same school. From the population two classes were required; therefore random sampling was used to determine which two class groups were to be used for the research, resulting in a sample of 107 learners.

6.4.2 Instruments

The following instruments were used:

6.4.2.1 A biographical questionnaire

A biographical questionnaire (see paragraph 4.6.1 and Appendix A) consisted of 11 items and its aim was to ascertain the subjects' history. The questionnaire contained questions about the subjects' gender, age, expectations and prior achievement in English.

6.4.2.2 A Pre-test (Y1)

The Pre-test (Y1) (see paragraph 4.6.2 and Appendix B) consisted of a passage titled "The guitar"(Ellis *et al.*, 1988: 126) and was read and answered as a comprehension test.

6.4.2.3 The Motivated Strategies for Learning Questionnaire (MSLQ)

The MSLQ (Pintrich & De Groot, 1990: 33) (see paragraph 4.6.3 and Appendix C) consisted of 44 items on learners' motivation and their use of self-regulated learning strategies. The motivation items inquired about the learners' self-efficacy, test anxiety and intrinsic value while the self-regulated strategy section probed cognitive strategy use and the use of self-regulated strategies. Learners responded to a 7-point Likert Scale (1 = "not at all true of me" to 7 = "very true of me") evaluating their behaviour in an English class.

6.4.2.4 A Post-test (Y2 and Y3)

Post-test 1 (Y2)

Post-test 1 (see paragraph 4.7.1 and Appendix D) consisted of exercises to test skimming, finding keywords and key sentences, prediction and comprehension skills.

Only the experimental group wrote the test. The aim of the test was to determine whether the reading strategies' instruction had been successful.

Post-test 2 (Y3)

Post-test 2 (Y3) (see paragraph 4.7.2 and Appendix E) consisted of one passage that was to be read with understanding. Learners had to answer questions that evaluated their understanding, factual knowledge and general English knowledge.

6.5 PROCEDURE

Two class groups of 51 and 56 Grade 8 learners were selected from a population of three class groups (159 learners) of an intermediate school in the Badplaas Circuit in Mpumalanga Province. Instruction in reading strategies was given over 17 days after which questionnaires and tests were marked and scored. Scores and data were analysed by means of the Statistica Multiple Regression Analysis Program.

6.6 RESULTS

The hypothesis that there is a relationship between learning strategies and academic achievement was accepted with certain reservations.

The literature review indicated that the appropriate use of cognitive, metacognitive and resource management strategies results in improved academic performance. It was indicated that learning strategies also enhance self-efficacy, which is a predictor of high academic achievement. Learners who have high self-efficacy feel capable of performing learning tasks and have a high motivation level.

A multiple regression analysis using the basic set of variables indicated a collective contribution by all the variables to academic achievement but with no particular variable contributing statistically significantly to academic achievement. On the other hand self-efficacy made a statistically significant contribution towards academic performance. This contribution though was not of practical significance.

The results of the multiple regression analyses using the experimental variables indicated that the learning strategies skimming, prediction and identifying keywords were good predictors of academic achievement as these learning strategies contributed significantly to the variance of academic achievement. The hypothesis that there is a relationship between learning strategies and academic achievement was therefore accepted on the basis of the multiple regression analysis (paragraph 5.7).

Although the hypothesis that there is a relationship between learning strategies and academic achievement was accepted on the basis of the multiple regression analyses, the hypothesis was accepted with some reservations because a comparison between the experimental and the control groups by means of a two-sample t-test revealed a statistically significant difference, but with no practical significant difference.

6.7 CONCLUSION

The review of literature and the empirical study established that learning strategies have an influence on academic performance. The hypothesis that there is a relationship between learning strategies and academic achievement of Grade 8 Siswati-speaking learners in English was, therefore, accepted with some reservations.

6.8 LIMITATIONS

The study had a number of limitations. The first one was the time spent for the experimental treatment which was very short (17 days), considering that only two hours was spent on learning strategies instruction each day. One of the conclusions made was that for learners to use learning strategies independently, a longer period of training is needed so that learners could inculcate spontaneous use of strategies in order to benefit more from their learning.

Another limitation was the time of the year when the study was undertaken. The study was conducted during the last days of the third quarter just before the September holidays and extended to the beginning of the last quarter of the year. That was an unstable period of the year because schools are then usually busy with revision.

Although the experimental school was stable at the time of the study, there was, however, some excitement in the environment (e.g. a neighbouring school had started with exams and learners only attended school when they had to write exam papers). This affected the learners' concentration and responses to the experiment.

The fact that there were school holidays half-way through the study disturbed the reinforcement of trained skills. Although learners were given many assignments to complete at home during this period, a large number of learners did not do the given exercises. This created a limitation in practising the learning strategies taught and therefore impacted negatively in the learners' knowledge of the taught learning strategies.

6.9 RECOMMENDATIONS

It is, therefore, recommended that research involving classroom instruction should be given over a longer period (preferably over a minimum period of six months) to allow enough time for learners to acquire independent use of the learning strategies that were taught. The longer time recommended suggest that more time should be used in administering the treatment, an activity that would require that teachers at the school where the experiment is conducted be used as researchers. As a prerequisite, teachers shall have to know the purpose of such an intervention so that they can support and enhance the process. This involvement will also expose them to knowledge of the learning strategies and the methods of teaching these strategies to learners.

It is also recommended that learning strategy instruction be integrated with subject content to give it context. This does not mean that direct explanation of strategies and definition should be done away with, but that an integrated approach to the teaching of learning strategies be adopted so that learning strategy teaching be subject-based in order to facilitate practice by using day-to-day school work. This implies that all teachers of all subjects should receive strategy training in order to incorporate strategic instruction into the subjects they teach.

6.10 CONCLUDING REMARKS

In this research learning strategies variables were investigated. The aim was to determine how these variables influenced academic achievement. It is hoped that the findings of this research will be useful in dealing with the high failure rate of Grade 8 Siswati-speaking learners in English. It is also believed that by teaching learners how to use learning strategies their self-efficacy in performing tasks will be improved and that they will then become motivated for learning. Highly motivated learners show high academic achievement.

APPENDIX A

BIOGRAPHICAL QUESTIONNAIRE

BIOGRAPHICAL QUESTIONNAIRE

Questionnaire Number [ ][ ][ ] (1-3)

Card Number [ ] (4)

1. Name of student..... Student umber..... [ ][ ] (5-6)

2. Age [ ][ ] (7-8) [ ][ ] (9-10)
Years Months

3. Gender
Male 1
Female 2 (11)

4. Do your parents encourage you to study?
No 1
Yes 2 (12)

5. Is English one of your difficult subjects? Indicate on the following scale how difficult you find English in comparison with your other subjects.

Very difficult	5
Moderately difficult	4
As difficult as other subjects	3 (13)
Moderately less difficult	2
Not difficult at all	1

6. Do you get teaching in English after school hours?
No 1
Yes 2 (14)

7. What is the mark you would like to get in English? [ ][ ][ ] (15-16)

8. What is the mark you would be happy with? [ ][ ][ ] (17-19)

9. Are you satisfied with the mark you received for English in the last exam?
No 1
Yes 2 (20)

10. Marks obtained [ ][ ][ ] (24-26)

APPENDIX B

PRE-TEST

Read the following passage and answer the questions below.

The guitar

The guitar is one of the most versatile and exciting instruments in rock, jazz and classical music. It has all the qualities a musician could desire. It can be used simply for accompaniment rhythm or to dominate in solos or to entrance with the intricacy of its harmonies.

There are several different kinds of guitar. The classical guitar has nineteen frets and a wide flat fingerboard, which (though more difficult to play on than the curved type) allows room for the demanding techniques of classical guitar playing. The classical guitar has unique strutting under the bridge. This enables the thin pine table which is responsible for the special tone and the volume of the instrument, to vibrate without splitting the wood on top.

The flattop acoustic guitar is used for folk music. Its construction is very similar to that of the classical guitar except that it has a cross-bracing rather than fan-strutting to give added strength to the table under the bridge, where it takes the strain of the metal strings. The other differences are mainly in the neck. This is longer, with at least fourteen frets between the body and nut. It is also narrower and has a slight chamber for ease of fingering.

The semi-acoustic is an electric guitar. It is a very popular rhythm and jazz instrument. It is a cello-bodied and is fitted with pick-ups. The sounds of both the strings and the body are amplified, but because the sound produced by the guitar itself does not need to be very loud, the instrument is quite shallow in its construction. The semi-acoustic guitar has a characteristically mellow sound. The solid-body guitar is the instrument that lead guitarists prefer in modern bands. Like the semi-acoustic it is fitted with pick-ups. These convert the vibrations produced by the strings into electrical impulses which are then amplified and made to sound any way the musician wants with the use of various gadgets such as pre-amplifiers and effects pedals. The solid body guitar, like the flat-top and semi-acoustic, has a pick guard to protect the

soft table from scratches. Solid-body guitars have been made in many unorthodox shapes and sizes. For example there is a double-necked guitar which combines two necks on one instrument.

All guitars are constructed in much the same way, apart from the solid guitar where the construction of a properly resonant body is not necessary. First the sides of the guitar are planed down to 3 mm or less and then shaped over a bending iron or by clamping them in the mould. Next, the soundboard and the back are made. Both are constructed out of single planks of wood, which are split down the middle and then glued edge to edge. Cross-braces and struts have to be glued to the underside of the soundboard to give it the strength required. The strutting is tapered away with a chisel to reduce the weight at the top of the instrument. The soundboard and back are then fitted to the side. Any waste is trimmed off using a fret saw so that there is a perfect fit. The body is then sanded down.

Next the bony fingerboard has to be made. Great pains are taken to ensure that this fits perfectly from the nut, which attaches the fingerboard to the neck and head, to the sound hole in the body. The fret positions are measured with great accuracy and then cut using a fine saw. Fret wire is hammered into the cuts very gently so that the damage is caused to the fret board. The fingerboard is then attached to the head and neck, which is then dovetailed into the top of the body. Next the bridge is glued into position, and the whole instrument is given a final polish and varnish. When the strings are attached the guitar is ready for selling.

Answer the following questions:

a) Write down the names of the four different types of guitar described in the passage.

b) Name any other three musical instruments you know.

c) Complete the table below :

Type of guitar	Type of music	Distinguishing features
i.	classical music	
ii.	folk music	
iii.		many shapes and sizes
iv.		has a mellow sound

d) In not more than 5 sentences write a summary of the passage.

e) Say whether the following statements are true or false and give reasons.

i. The classical guitar does not have a pick guard.

ii. The classical and the semi-acoustic guitar both have curved bodies.

iii. All guitars must have bodies that amplify the sound produced by the strings.

iv. When the guitar is finished the cross-braces and the struts are invisible.

v. The guitar is polished or varnished after all the main parts have been assembled.

APPENDIX C

MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE (HIGH SCHOOL)

MSLQ-HS

MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE (HIGH SCHOOL)

National Center for Research to improve Postsecondary Teaching and Learning (NCRIPTAL)

School of Education, The University of Michigan,
Ann Arbor, Michigan

Adapted by

J.L. de K. Monteith (Potchefstroom University for CHE)
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M.J. Mathebula

For

Standard 7 learners

The attached questionnaire asks you about your study habits, your learning skills, and your motivation for work in this subject

THERE ARE NO RIGHT OR WRONG ANSWERS
TO THE QUESTIONNAIRE. THIS IS NOT A TEST.

We want you to respond to the questionnaire as accurately as possible, reflecting your attitudes and behaviours in this subject.

PART A. MOTIVATIONAL BELIEFS

The following questions ask you about your motivation for and attitudes towards this class. **Remember there are no right or wrong answers,** just answer as accurately as possible. Use the scale below to answer the questions. If you think the statement is very true of you, cross out 7, if you think a statement is not at all true of you, cross out 1. If the statement is more or less true of you, find the number between 1 and 7 that describes you. Cross out this number.

Not at all true of me	1	2	3	4	5	6	7	Very true of me

1. I prefer classwork that is challenging so that I can learn new things.
2. Compared with other students in this class I expect to do well.
3. I am so nervous during a test that I cannot remember facts I have learned.
4. It is important for me to learn what is being taught in this class.
5. I like what I am learning in this class.
6. I am certain I can understand the ideas taught in this class.
7. I think I will be able to use what I learn in this subject in other subjects.
8. I expect to do very well in this class.
9. Compared with others in this class I think I am a good learner.
10. I often choose passages I will learn something from even if they require more work.
11. I am sure I can do an excellent job on the problems and tasks assigned for this class.
12. I have an uneasy, upset feeling when I take a test.
13. I think I will receive a good mark in this class.
14. Even when I do poorly in a test I try to learn from my mistakes.
15. I think that what we are learning in this class is useful for me to know.
16. My study skills are excellent compared with others in this class.
17. I think that what we are learning in this class is interesting.
18. Compared with other learners in this class I think I know a great deal about the subject.
19. I know that I will be able to learn the material for this class.
20. I worry a great deal about tests.
21. Understanding this subject is important to me.
22. When I take a test I think about how poorly I am doing.

PART B: SELF-REGULATED LEARNING STRATEGIES

The following questions ask about your learning strategies and study skills for this class. **Again, there are no right or wrong answers. Answer the questions about how you study in this class as accurately as possible.** Use the same scale to answer the remaining questions.

Not at all true of me	1	2	3	4	5	6	7	Very true of me

If you think the statement is very true of you, cross out 7; if a statement is not at all true of you, cross out 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you. Cross out this number.

23. When I study for a test, I try to put together the information from the teacher and from the book.
24. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.
25. I ask myself questions to make sure I know the material I have been studying.
26. It is hard for me to decide what the main ideas are in what I read.
27. When work is hard I either give up or study only the easy parts.
28. When I study I put important ideas in my own words.
29. I always try to understand what the teacher says even if it doesn't make sense.
30. When I study for a test I try to remember as many facts as I can.
31. When studying, I copy my notes over to help me remember the material.
32. I work on practice exercises and answer end of chapter questions even when I don't have to.
33. Even when study materials are dull and uninteresting, I keep working until I finish.
34. When I study for a test I practise saying the important facts over and over to myself.
35. Before I begin to study I think about the things I will need to do to learn.
36. I use what I have learnt from old homework assignments and the textbook to do new assignments.
37. I often find that I have been reading for class but don't know what is all about.
38. I find that when the teacher is talking I think of other things and don't really listen to what is being said.
39. When I am studying a topic, I try to make everything fit together.
40. When I am reading I stop once in a while and go over what I have read.
41. When I read the material for this class, I say the words over and over to myself to help me remember.
42. I outline the chapters in my book to help me study.
43. I work hard to get a good mark even when I don't like a class.
44. When reading I try to connect the things I am reading about with what I already know.

ANSWER SHEET

NAME:

STUDENT NUMBER:

PART A: MOTIVATION

1	1	2	3	4	5	6	7	(2)
2	1	2	3	4	5	6	7	(3)
3	1	2	3	4	5	6	7	(4)
4	1	2	3	4	5	6	7	(5)
5	1	2	3	4	5	6	7	(6)
6	1	2	3	4	5	6	7	(7)
7	1	2	3	4	5	6	7	(8)
8	1	2	3	4	5	6	7	(9)
9	1	2	3	4	5	6	7	(10)
10	1	2	3	4	5	6	7	(11)
11	1	2	3	4	5	6	7	(12)
12	1	2	3	4	5	6	7	(13)
13	1	2	3	4	5	6	7	(14)
14	1	2	3	4	5	6	7	(15)
15	1	2	3	4	5	6	7	(16)
16	1	2	3	4	5	6	7	(17)
17	1	2	3	4	5	6	7	(18)
18	1	2	3	4	5	6	7	(19)
19	1	2	3	4	5	6	7	(20)
20	1	2	3	4	5	6	7	(21)
21	1	2	3	4	5	6	7	(22)
22	1	2	3	4	5	6	7	(23)

ANSWER SHEET

NAME:

STUDENT NUMBER:

CARD NUMBER:

PART B: LEARNING STRATEGIES

23	1	2	3	4	5	6	7	(24)
24	1	2	3	4	5	6	7	(25)
25	1	2	3	4	5	6	7	(26)
26	1	2	3	4	5	6	7	(27)
27	1	2	3	4	5	6	7	(28)
28	1	2	3	4	5	6	7	(29)
29	1	2	3	4	5	6	7	(30)
30	1	2	3	4	5	6	7	(31)
31	1	2	3	4	5	6	7	(32)
32	1	2	3	4	5	6	7	(33)
33	1	2	3	4	5	6	7	(34)
34	1	2	3	4	5	6	7	(35)
35	1	2	3	4	5	6	7	(36)
36	1	2	3	4	5	6	7	(37)
37	1	2	3	4	5	6	7	(38)
38	1	2	3	4	5	6	7	(39)
39	1	2	3	4	5	6	7	(40)
40	1	2	3	4	5	6	7	(41)
41	1	2	3	4	5	6	7	(42)
42	1	2	3	4	5	6	7	(43)
43	1	2	3	4	5	6	7	(44)
44	1	2	3	4	5	6	7	(45)

APPENDIX D

POST-TEST 1

SKIMMING
PREDICTION
KEYWORDS

TEST 1 A: SKIMMING

For 30 seconds skim through the following passage and then answer the questions that follow:

THE RENAISSANCE: AGE OF NEW IDEAS

The Renaissance, pronounced REN uh sahns or ren uh SAHNS, is the name given to a period of history that lasted about 300 years between the Middle Ages and modern times. It began in Italy about 1300. The Renaissance spread throughout Europe during the 1400s and 1500s. It swept away customs and institutions that had dominated Europe for almost a thousand years. The new ideas and attitudes that grew up still influence our lives today.

Probably the greatest achievement of the Renaissance came in scholarship (learning) and the arts. The people of the Renaissance looked back on the Middle Ages as a time of ignorance and superstition. They tried to imitate the ways of life in ancient Greece and Rome. Scholars found and translated ancient Greek and Latin writings that had been lost during the Middle Ages. Artists invented new techniques to make their works as beautiful and lifelike as those of the Greek and Roman artists. Writers broke with the religious thinking of the Middle Ages. Like the Greeks and Romans, they were more interested in man than in God.

The main ideas of the Renaissance

The Renaissance was an age of adventure and curiosity. Men became fascinated with the world about them. They made scientific studies of plans and animals, and tried daring experiments in astronomy and physics. Most of all, they studied man himself.

The importance of man

Everything that concerned man and his life on earth became important to the people of the Renaissance. This emphasis on man formed a philosophy known as humanism. During the Renaissance, a person's class in society became less important. Men began to attach importance on the individual. They took pride in their own achievement and

began to judge others on the basis of merit rather than birth. In their works artists tried to glorify man. At the same time the artists tried to win fame for themselves.

Painting, sculpture, architecture and literature

Painting became more realistic than it had been before. Most painters of the Middle Ages only painted religious subjects. Renaissance painters preferred portraits, landscapes and scenes of everyday life even in religious paintings. Renaissance artists made their figures look like real people. They often dressed Biblical figures in clothing of their own day.

Sculpture showed a new understanding of human anatomy. Throughout the Middle Ages, sculpture had been used merely to decorate buildings. Figures were so thickly covered with clothes that the human shape underneath could barely be seen. Now, sculptors created status that was not stuck to a background. They often carved nude figures, and showed muscles and joints accurately.

Renaissance literature emphasised individual personality. New forms, such essays and biographies became important. Most medieval literature had been written in Latin. Renaissance writers began using vernacular (national) languages such as French and Italian.

The Renaissance in Italy

The Renaissance began in the city of Florence in central Italy. The painters, sculptors, architects and writers who lived there included some of the greatest artists the Western World has ever known.

Renaissance art and literature reached their high point in the 1500s; a period called the high Renaissance. In this period Rome, not Florence was the centre of art and science in Italy.

The Renaissance spread to Europe

As political, social and economic conditions changed in various European countries, Renaissance attitudes began to spread.

The main countries where the Renaissance spread were France, Germany, the Netherlands, England and Spain. Here people started to use new ideas to develop their own styles.

Answer the questions below. Answer question 1-7 by making a cross next to the answer of your choice.

1.1. What is the whole passage about?

a) Middle ages
b) Religion
c) The Renaissance

	1
	2
	3

(4)

1.2 Will the passage tell you about

a) Year 2000
b) The main ideas of the Renaissance
c) The stone age

	1
	2
	3

(5)

1.3 Is the passage about

a) The importance of God
b) The importance of man
c) Life after death

	1
	2
	3

(6)

1.4. Will the passage tell you more about

a) Europe
b) Painting during the Renaissance
c) Renaissance

	1
	2
	3

(7)

1.5 Is the article about

a) World war
b) The dark ages
c) Renaissance

	1
	2
	3

(8)

1.6 Will the passage tell you about

a) Architecture during the Renaissance
b) Family life
c) Sport

	1
	2
	3

(9)

1.7 Renaissance is

a) The period of old ideas
b) The period of religious thinking
c) The period of new ideas
d) The period of customs

	1
	2
	3
	4

(10)

1.8. What is subheading 1 about? | | | (11-12)

1.9. What is subheading 2 about? | | | (13-14)

1.10. What is subheading 3 about? | | | (15-16)

1.11. What is subheading 4 about? | | | (17-18)

1.12. What is subheading 5 about? | | | (19-20)

1.13. What is subheading 6 about? | | | (21-22)

Questionnaire Number [ ][ ] (1-2)

Card Number [ ] (3)

TEST 1 B: PREDICTION

Look at the supplied four pictures from the novel "The house on the hill".

Read the copy of the blurb of the book.

Answer the following questions.

2.1. What is the title of the book? [ ][ ] (4-5)

2.2. Who do you think the two people on the cover are? [ ][ ] (6-7)

2.3. What time of the day do you think these people met? [ ][ ] (8-9)

2.4. What do you think the conversation of the people on the cover is about? [ ][ ] (10-11)

2.5. Look at picture 1 and write down what you think is happening. [ ][ ] (12-13)

2.6. What is happening in picture 2? [ ][ ] (14-15)

2.7. What is happening in picture 3? [ ][ ] (16-17)

2.8. Who are in picture 4 and what do you think is happening? [ ][ ] (18-19)

2.9. What do you think the book is about? Write in not more than 5 sentences. [ ][ ] (20-25)

Questionnaire Number | | | (1-2)

Card Number | | | (3)

TEST 1 C: Identification of keywords and key sentences.

Read the following passage and answer the questions below.

1) There are many different kinds of musical instruments but broadly speaking musical instruments can be divided into four classes. These four classes are stringed instruments such as guitars and violins; percussion instruments such as drums and cymbals; woodwind instruments such as flutes; and brass instruments such as trumpets.
2) Stringed instruments produce sound by setting a string vibrating. There are three ways you can vibrate a string; you can pluck it as in a guitar, or you can stroke it with a bow as in a violin, or you can strike it as in piano.
3) There are also three things you can do to strings on a stringed instrument to change the sound the string makes. The shorter you make a string of a given thickness, the higher the pitch of the note it produces. The more tightly you stretch a string (thus increasing the tension in the string), the higher the pitch it produces. The heavier the string is for a given length and tension, the lower the pitch of the note it produces.
4) Percussion instruments have to be hit or struck to produce sound. The drum is a good example. Music probably began with a man beating a drum. All drums have drumheads made of animal skin stretched across the edges of the drum. When you strike one of the drumheads you set the air inside the drum vibrating.
5) Have you ever blown across the top of an empty bottle? If you have, scientists will tell you that you have played a woodwind instrument! As you blew your breath set the air inside the bottle vibrating, and you heard a soft low whistling sound. An instrument that is made to sound when someone blows across an opening is a woodwind instrument. Woodwind refers to a family of instruments which were originally made of wood. Today, flutes and saxophones are made of metal. Clarinets, oboes and bassoons are still made of wood.
6) Bugles and trumpets have been known for thousand of years. Four thousand years ago, it is believed Moses sounded a bugle of a ram's horn to help direct the

migrating Hebrew tribes in their exodus from Egypt. We also know that the Vikings used trumpets to signal from one ship to another. In our own folklore we hear of Rabbit using the horns of another small animal to blow music on.

7) Today trumpets and bugles are made from a mixture of zinc and copper, called brass. Zinc does not pick up vibrations very easily but when it does it gives a loud tone. Copper picks up vibrations very easily, but its tone is not very loud. Many different combinations of these metals have been tried. So far thirty per cent zinc and seventy per cent copper is believed to be the best.

Questions:

Mark your choice with an x in the relevant box.

3.1 The most important sentence in paragraph 1 is:

a) These four classes are stringed instruments such as guitars and violins.		1
b) Woodwind instruments such as flutes, and brass instruments such as trumpets.		2
c) There are many different kinds of musical instruments, but broadly speaking they can be divided into four classes.		3
d) But broadly speaking musical instruments can be divided into four classes.		4

(3-4)

3.2. The most important sentence in paragraph 2 is:

a) Stringed instruments produce sound by setting the string vibrating.		1
b) There are three ways you can vibrate a string.		2
c) You can pluck it - as in a guitar.		3
d) There are three ways in which you can vibrate a string. You can pluck it as in a guitar or you can stroke it with a bow as in a violin or strike it - as in a piano.		4

(5-6)

3.3. The most important sentence in paragraph 3 is:

a) There are also three things you can do to strings on a stringed instrument to change the sound the string makes.		1
b) The more tightly you stretch a string, the higher the pitch of the note it produces.		2
c) The heavier the string is for a given length and tension, the lower the pitch of the note it produces		3
d) The shorter you make a string of a given thickness, the higher the pitch of the note it produces.		4

(7-8)

3.4. The most important sentence in paragraph 4 is:

a) When you strike one of the drumheads you set the air inside the drum vibrating.		1
b) The drum is a good example.		2
c) All drums have drumheads made of animal skin stretched across the edges of the drum.		3
d) Percussion instruments have to be hit or struck to produce sound.		4

(9-10)

3.5. The key sentence for paragraph 5 is:

a) Have you ever blown across the top of an empty bottle?		1
b)As you blew, your breath set the air inside the bottle vibrating and you heard a soft low whistling sound.		2
c) Woodwind refers to a family of instruments, which were originally made of wood.		3
d) An instrument that is made to sound when someone blows across an opening is a woodwind instrument.		4

(11-12)

3.6. The key sentence for paragraph 6 is:

a) Four thousand years ago, it is believed that Moses sounded a bugle made of ram's horn to help the migrating Hebrew tribes in their exodus from Egypt.
b) Bugles and trumpets have been known for thousands of years.
c) We also know that the Vikings used trumpets to signal from one ship to another.
d) In our folklore we hear of Rabbit using the horn of another animal to blow music on.

	1
	2
	3
	4

(13-14)

3.7. The summary of paragraph 1-6 is:

a) 1a	2d	3d	4b	5a	6d
b) 1b	2c	3b	4c	5b	6a
c) 1d	2b	3c	4a	5c	6c
d) 1c	2a	3a	4d	5d	6b

	1
	2
	3
	4

(15-16)

3.8. The most appropriate heading for the passage is:

a) Percussion instruments
b) Musical instruments
c) Bugles
d) Stringed instruments

	1
	2
	3
	4

(17-18)

Write down the keywords for :

3.9 Paragraph 2. | | 1 | (19-20)

3.10. Paragraph 3 | | 2 | (21-22)

3.11. Paragraph 4 | | 3 | (23-24)

3.12. Paragraph 6 | | 4 | (25-26)

3.13 Present the information in paragraph 1 in text map form. | | | (27-36)

APPENDIX E

POST-TEST 2

COMPREHENSION TEST

Read the following passage and answer the questions below.

THE FUTURE OF THE SEA

By the year 2000 the population of the world will have doubled. More than ever we will need to use the oceans to support the growing population. This can be done in a number of ways. However, care must be taken to ensure that the delicate balance of nature is not upset. It is important that the oceans are properly managed so that their resources are not destroyed.

Exploitation of the sea is likely to take three forms: extracting minerals from the seabed, fish farming and using the tides as a source of energy.

The rocks on the seabed contain valuable minerals. Already people have found ways of tapping this mineral wealth. For hundreds of years scientists have known about vast quantities of strange lumps called 'nodules' that are made of a valuable metal called manganese. Unfortunately the manganese nodules are found in deep water out of reach of divers and most submarines. Remote-controlled dredges acting like giant vacuum cleaners have been designed to suck up the nodules from the seabed. However, the most important mineral to be obtained from the seabed is oil. This is extracted by erecting huge drilling rigs from which wells are drilled, and production rigs, which pump the oil out. It is likely that developments in technology will increase our capacity to extract minerals from the seabed.

Fish farms consist of special enclosures close to the shore, which fill up with seawater. They have been used for many years with oysters and prawns and some kinds of fish. Scientists hope that by discovering more about breeding and feeding habits of fish many fish farmers can be started.

The sea provides a cheap source of potential energy if the tides can be harnessed. This has already been tried on limited scale. On the north coast of Brittany, the French have constructed the world's first tidal power station. As the tide rises it is trapped

behind the big wall barrage, which has been built across the mouth of a river. The trapped water is then used to drive twenty-four turbines in order to produce electricity. Wave power is likely to become more popular in the future, because it is a lot safer than nuclear power.

The threat to the oceans is of two kinds: over-exploitation of the sea's resources, and pollution.

A good example of the over-exploitation of resources is in fishing. Fishing has become a mechanised, large scale operation. The world fish catch has increased by about 7 percent each year since 1945. This intensive fishing has so reduced fish stocks that the fish are not able to regenerate fast enough. Other sea creatures such as whales have been hunted to the point of extinction. If the oceans are to supply much of the food requirements of the world in the future, the fisheries will need to be controlled much more thoroughly.

The greatest threat to the future of oceans, however, is pollution. The oceans are used as a dumping ground for waste. Much of the sewage from coastal cities is discharged directly into the sea. This reduces the oxygen content of the seawater depriving animals of oxygen and causing their death. One of the most spectacular forms of pollution comes from oil spills when huge oil tankers are wrecked when there is a blow-out from an offshore drilling platform. Oil is harmful to plants and animals and beaches. Manufactured chemicals are also likely to cause damage to the sea. Pesticides such as DDT get washed into the oceans and then become concentrated in marine animals. Nuclear waste has also been dumped at sea with the possibility of radioactivity entering the world's food chains.

The oceans are a challenge. Only if nations work together to manage them, will they survive and contribute to our future.

POST-TEST 2: QUESTIONS

Answer the following questions.

1. What are the three forms of sea exploitation that are described in the passage?
2. Name two kinds of threat that face the sea.
3. Mention three ways in which sea pollution occurs.
4. Write down the number of lines where the following sub topics can be fitted in the passage:

a) Exploitation of the resources of the sea.

b) The threat to the ocean

5. In your own words explain what the following words mean:

a) Tide

b) Barrage

c) Extinction

d) Pollution

6. Complete the following list using the information from the passage:

a) Sea creatures

I. .....

II. ... .

III... .....

IV.....

b) Types of energy

I. ----------

II. ----------

c) Minerals from the seabed.

I. ----------

II. ----------

7. Arrange the groups of words in such a way that the most general meaning is on the left and the most specific is on the right.

a) Fish - prawns - marine animals

b) Minerals - resources - manganese

c) Pesticides - DDT - manufactured chemicals

8. Write a summary of the whole passage in not more than 3 sentences.

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