

**THE INFLUENCE OF LEARNING STRATEGIES
LEARNERS' SELF-EFFICACY
AND
ACADEMIC ACHIEVEMENT**

by

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DECLARATION

I declare that this research project is my own effort. It is being submitted for the degree of Masters of Education at the University of South Africa, Pretoria. It has not been submitted for examination or any degree in any other university before.

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ABSTRACT

Accelerated social change emphasises knowledge and innovation, creating a need for learners to excel at learning and thinking. The study's purpose was to replicate previous cognitive research findings, which emphasise the positive influence of learning strategies on learners' self-efficacy and academic achievement and to verify the validity of training learners in learning strategy-use to promote learner-autonomy and accountability. The research targeted a selected primary school in a Black township in Gauteng Province using quasi-experimental and qualitative methods. The sample comprised 152 4th - 7th graders assigned by quota system to the treatment group and the control group. Learners participated in pre-tests and post-tests for learning strategies, self-efficacy and academic achievement. Only the experimental groups received strategy instruction before the post-test. The experimental group's improved performance compared to the control group's lower performance suggests the effectiveness of strategy-training. Subsequent learner reports of improved self-efficacy beliefs and academic achievement confirm strategy-effect on these variables.

KEY CONCEPTS

LEARNING STRATEGIES,

SELF EFFICACY

SELF- REGULATED LEARNING

ACADEMIC ACHIEVEMENT

MOTIVATION

COGNITIVE

METACOGNITIVE

INFORMATION PROCESSING

OUTCOME EXPECTATIONS

LIST OF ACRONYMS

a	after intervention
ABET	Adult Basic Education
ANOVA	Analysis of Variance
ANCOVA	Analysis of Co-variance
b	before intervention
COLTS	Culture of Learning and Teaching
CPSES	Children's Perceived Self-Efficacy Scale
d	difference/improvement between before and after intervention
DE/DoE	Department of Education
EAZ	Education Action Zone
EFA	Education for All
EIC	Education Information Center
GDE	Gauteng Department of Education and Training
GET	General Education and Training Band
HOD	House of Delegates
HOR	House of Representatives
IEB	Independent Examination Board
LTM	Long term memory
MLSO	Motivated Learning Strategy Questionnaire
NQF	National Qualifications Framework
OBE	Outcomes- Based Education
SAHRC	South African Human Research Council
SAQA	South African Qualifications Authority
SOWETO	South Western Townships
SR	Sensory register
SRL	Self-Regulated Learning
SRLIS	Self-Regulated Learning Interview Schedule
STM	Short term memory
WM	Working memory

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CHAPTER 1

INTRODUCTION, PROBLEM FORMULATION AND AIMS OF THE STUDY

1.1 INTRODUCTION

This study on the effect of learning strategies on learners' self-efficacy perceptions and academic performance is part of an old but ongoing search for factors that can improve the low academic attainment by learners and the declining educational standards in institutions of learning, which have always posed major challenges to education systems all over the world (Patchen 2004:3, 19; Slabbert, de Kock & Hattingh 2009:1&17; Steyn, Steyn & De Waal 2001:6-7). Such a quest for effective learning is necessitated by the evidence that correlates educational success with the development and prosperity of individuals as well as that of their communities (Wobmann 2002:1-3). On the other hand, low educational attainment is linked with joblessness, poverty, delinquency and crime (Vitaro, Larocque, Janosz & Tremblay 2001:402, West & Pennel 2003:14; Vaughn, Bos & Schumm 2000:315). Notions of effective learning and academic achievement have become more pronounced in the rapidly changing and competitive world of the 21st century and beyond, where citizens are expected to learn and adapt readily to any new learning situation they encounter, and to participate fully and prosperously in their society (Anderson 2000:4; Chisholm 2000:18; Dawetti 2000:69-71; West & Pennel 2003:17).

With this picture in mind, a series of educational conferences (Jomtien 1990, Johannesburg 1999, Dakar 2000, and Katmandu 2001) resolved to campaign for the provision of quality public education and life-long learning for all citizens of the world (EFA) by 2015 (Hatwood-Futrell 2001:12-13; Kellaghan & Greany 2004: 1, Matsuura 2002:5).

Most countries have introduced various projects in order to meet their educational challenges. While there may be visible changes in the education systems of some countries because of the improvement projects they introduced, the challenges are apparently still daunting in others, including South Africa, causing incessant calls for reforms from many quarters (Kruger & Adams 2010:5; Montgomery 1998:140-148). Many of the improvement projects recommend intervention and remedial programs designed to meet the needs of particularly those learners who are under-performing, or have mild to moderate learning disabilities (Lopez 2001:51 and Montgomery 1998:37).

Intervention is mostly recommended for younger learners, ideally while still in primary school, so that they can benefit optimally from advanced learning in future, making them active, confident and autonomous life-long learners who achieve academically. Researchers also contend that remedial work carried out at a later stage in a child's life is costly in more ways than simply financial; it is time-consuming and impacts on the child's self-image negatively (Castello 2000:4, 5; Meichenbaum & Biemiller 1998:1, 41-45; Wallace 2000: xii).

The most common approach of these programmes is to discourage learners from storing vast amounts of facts, but rather that they should "learn how to learn" new information by applying effective learning strategies (Castello 2000:1-6; Montgomery 1998:140; Paris & Paris 2001:91-93; Van Keer & Verhaegde 2005:291). According to Anderson (2000:437), bad performance in learning is not only caused by lack of relevant knowledge, but it is also the result of poor learning and memory strategies.

'Learning strategies' are defined as "systematic plans, thoughts, affect and behaviour that are consciously invoked by learners to facilitate information processing, especially during the learning and the thinking processes" (Lopez 2001:49; Mayer 2008:290-292; Weinstein & Hume 1998:120) and enhance their self-efficacy (Linnenbrink & Pintrich 2003: 123-124; Schunk, Pintrich & Meece 2008:310 & 327-332).

Self-efficacy is defined as "... a person's judgment of his or her capability to organise and execute the courses of action that are required in bringing about certain desired levels of

performance” (Bandura 1977a:193). ‘Academic self-efficacy’ is a learner’s belief in how well he or she can perform learning tasks to confident levels of achievement (Bong 2002:133; Pastorelli Caprara, Barbaranelli, Rola, Rozsa & Bandura 2001:89; Walker 2003:174; Zimmerman 2002:82).

Self-efficacy beliefs are further described as predictors of learner motivation, thus affecting the choices they make, how much effort they expend, their persistence even in the face of obstacles, and their courage to seek help where they need it (Bong 2002:134; Zimmerman 2000:86).

Given the importance of knowledge about learning strategies and positive self-efficacy perceptions in learning situations, a study investigating learners’ knowledge and use of learning strategies for the purpose of enhancing their self-efficacy perceptions and academic performance is essential. Although children are exposed to some form of strategy-use even before they become part of formal education (e.g. rehearsal strategy/repetition), Van Keer and Verhaegde (2005:292) insist that it cannot be assumed that they develop strategic knowledge spontaneously, or that they understand that they have developed strategic knowledge. Therefore, equipping learners with learning strategies enables them to manage and effectively regulate information, comprehension, knowledge acquisition and retrieval; while enhancing their positive self-efficacy beliefs raises their motivation to achieve at a higher level, as active, self-regulated and life-long learners (Linnenbrink & Pintrich 2003: 123-124; Mayer 2008:423). Walker (2003:186) argues that teachers have a major role to play in laying the foundation for their learners’ future success. They also have to be equipped with appropriate methods that will enable them to teach the application of strategies to their learners.

1.2 ANALYSIS OF THE RESEARCH PROBLEM

1.2.1 Awareness of the problem

Having taught for more than thirty years in a number of Gauteng (RSA) township schools, I have witnessed the yearly disappointment, frustration and controversies in Black communities following the failure and under-achievement of scores of learners, especially after the publication of the matriculation results.

To date, almost two decades since the introduction of a progressive and non-racial system of education, the failure rate of Black learners is still very high. Only a few matriculants obtain a good pass; many more obtain only a minimum pass and many others have already dropped out of school earlier to swell the ranks of the unemployed.

Consequently, parents, out of concern for their children's future, 'vote with their feet', by opting to bus their children out of township schools, to 'better' schools (Foks 1997:131), such as independent schools and former model-C schools. Alternatively the children are registered with schools which were formerly administered by the now defunct House of Representative (HOR) and House of Delegates (HOD), which catered for Indians and Coloreds respectively in the apartheid dispensation (Garson 1999:6; Mangena 2001: 12; Ka Sibande 2001:22).

The national Department of Education has expressed their concern and dismay about the quality of teaching and learning in township schools, especially in terms of the continuing high failure and dropout rates in these schools (Kgosana 2007:21; Mabe 2001:3; Mkhabela 2004:6). Various school improvement programmes have been introduced by the national Education Department and by the Gauteng Department of Education (GDE), especially for the improvement of matric results and the general running of the schools. Amongst others, the Culture of Learning and Teaching campaign (COLTS) was launched in 1997, reviving education from collapse, following the 1976 Soweto uprising and the 1980 school boycotts when learners and their communities aired their dissatisfaction about the oppressive conditions in their schools, and called for

reforms and an alternative to 'Bantu education'. Nonetheless, township schools continued to produce poor results.

As a corollary to the COLTS, some secondary schools have been identified as the Education Action Zone (EAZ) schools, poor-performing, or dysfunctional schools. These schools have been marked for rigorous monitoring by the education officials because they produced less than a 20% pass-rate in the matric exams (GDE Annual Report 2001/2002; Fleisch 2002:103). Primary schools have received very little or no attention from the education authorities.

The recent decrease in the number of the EAZ schools would suggest that there is an improvement in learner achievement rates. However, critics believe that the results are contrived, or that the improvement is too meager to be euphoric about, because the general impression in the communities is that the quality of the passes obtained is unsatisfactory. Instead, it is suggested that much more still needs to be done to raise the standards of education (Kgosana, 2007:21; Jansen 2001: 7).

Meanwhile, the National Systemic Evaluation report on a sample of 1 000 learners representing 34 000 Grade six-learners from public schools throughout the country showed that learners achieved less than 50% in Natural Sciences, 40% in the language of learning, and 20% in Mathematics (Department of Education, Policy Brief 1 2006:1). Recent results have shown little or no improvement, leading to an emphasis on the new foundations for the learning intervention programme.

Interested parties argue about what they perceive as the causes of learners' poor performance. For many years it has become customary everywhere to attribute the causes of success or failure of learners to factors of mainly contextual nature, such as a lack of resources, the lack of parental support, teachers' incompetence and ineffective school and teaching approaches (Du Toit 2001:35; Jinks & Lorschbach 2003:113-115; Kgosana 2007: 9-10)

However, Kivilu (2000:48) argues that school programmes are not in touch with learners' needs because they are still very academic and theoretical. In a similar tone, Mahomed (2003:26) argues that, despite new progressive policies and programmes, education in South Africa, particularly for the poor in the townships and the rural areas, is still characterised by a tradition of conditioning education, teacher-centeredness and authoritarianism.

Moving away from the trend of looking for factors that reside outside the learner, Mahomed (2003:26) and Grewel (2001:5) contend that the lack of discipline, confidence, commitment low participation and rote-learning on the part learners are barriers to effective learning. Concurring with the latter view, Barr and Parret (2001: viii) cite the common complaint heard from teachers about the learners' lack of discipline, their inability to read and to work independently, as well as their inclination to disruptive behaviour.

Reiterating the views presented in the previous section, De Jager and Ferreira (2003:187) and Lopez (2001:50) insist that learners cannot learn effectively because they lack appropriate learning strategies, and that noticeable improvement in performance can be expected if intervention includes providing them with knowledge of effective learning/thinking strategies, and the motivation for learning to take responsibility for their own successes or failures.

Monteith (1998:118) maintains that feeling responsible for one's successes and failures is an important prerequisite for one's success in school, and an important characteristic of a self-regulated learner, who he defines as one that is metacognitively, behaviourally and motivationally an active participant in learning.

Furthermore, De Jager and Ferreira (2003:187) raise the concern that many teachers do not teach learning strategies because they themselves do not know about them, or that they may be teaching them without knowing that they are doing it. As a teacher and researcher, my observations are that many teachers and parents still incorrectly think

that learning means cramming large quantities of information, and reproducing it in tests and examinations.

In most cases the learners cram the work without understanding the information. This makes it difficult for them to own, to use, or to build upon this information as personal knowledge (Kruger 2010:4-5). That could be seen to have a negative effect on the teachers and learners' morale, which contributes to the low achievement rates and the inability to fulfill the learners' aspirations as individuals and the community. In spite of the changes in the curricula, many teachers have maintained the *status quo* as traditional teachers, while others have developed to meet the challenges of providing quality education and a decent future for their children.

This study took the approach that the school, as a learning institution, has an obligation to increase the learners' chances of success in class by providing them with the learning strategies that will help them to participate confidently and independently in learning.

Based on the arguments presented in the growing number of theories and studies reporting on the relation between learning strategies, self-efficacy and academic achievement, it could be argued that teachers have a responsibility to train their learners in self-regulated learning strategies of rehearsing, elaborating and organising information for basic and complex tasks in order to facilitate the deep processing, understanding and retention of the information that they are learning at any particular time. By so doing, they would not only raise the achievement and self-efficacy levels of learners, but the quality of education and standard of living would also improve.

To be able to instruct learners on the use of learning strategies, teachers need to understand the development stages (sensitive periods) of children, when they are ready for or responsive to certain experiences (Woolfolk 2010:27). This will enable the learners to be reached at their actual level of development with appropriate programmes and activities that enhance learning development, achievement and self-efficacy through deliberate instruction, modeling, providing practice and time for reflecting and

automatically applying the newly acquired learning strategies. If that is not the case, the teacher fails in his or her task of facilitator of learning.

1.2.2 Motivation for the study

The primary aim in conducting this study was to gain a comprehensive understanding of learning strategies and determine whether the knowledge and use of the strategies by primary school learners could promote their positive self-efficacy perceptions and academic achievement.

It was also important to understand how primary school learners develop and adopt effective strategies, especially strategies that facilitate text comprehension from a very early age because reading comprehension is described as the cornerstone to all learning.

Theories explaining the importance and the methods of teaching learning strategies to learners were reviewed. In particular, the learners' knowledge and use of learning strategies as a basis of their self-efficacy perception and academic achievement were examined.

Therefore, the purpose of this study was to determine the influence of learning strategies on the self-efficacy and academic achievement of primary school learners, especially those learners who attend a Black township primary school and to create and integrate a programme for early intervention which would help learners to approach learning strategically and achieve at a higher level while they function as lifelong and self-regulated learners.

Thus, this study was conducted:

- to gain a better understanding of learning and learning strategies and examine how the learning strategies apply to different levels of primary school learning
- to develop programmes that would develop the children's learning strategy knowledge and use and to evaluate the programmes in terms of their reliability, validity and potential for replication.

For this purpose, a literature review and an empirical investigation was conducted.

1.3 THE PRELIMINARY LITERATURE REVIEW

Among the various theories provided by the initial review of literature on primary school children's learning and development, the need for the examination of theories about influence of learning strategies and their influence on the self-efficacy and academic achievement of learners became apparent.

Besides helping the researcher to identify the problem, the literature review is a necessary step that acquaints the researcher and the readers with theoretical perspectives in their particular field of study. It involves the search, collection and analysis of existing literature on present and past accounts related to the chosen topic or similar to the problem at hand. It also informs researchers about the variety of research methods and techniques they can have, thus it will serve as another means of guiding various kinds of investigation (Collins, Du Plooy, Grobbelaar, Puttergill, Terreblance, Van Eeden, Van Rensburg & Wigston 2000: 45-50).

In this study, the available theories on the relationship between learning strategies, self-efficacy and academic achievement; as well as on research methods and the strategy instruction programmes were carefully studied, analyzed and used as a reference so that an integrated programme for strategy-training could be developed for primary school learners

The review of the literature revealed a growing body of theories and empirical studies on the learning strategies, self-efficacy and academic achievement relationship from overseas countries such as America, china and Europe. However, apparent dearth of literature and research programmes that are particularly aimed at primary schools catering mainly for Black township and rural learners of South Africa. Therefore, there is a dire need for suitable programmes to be developed, especially for the South African context.

D'Ailly (2003:84) insists that globalisation makes it imperative that parallel studies be conducted in different countries and situations, so that different communities can develop an understanding of the cross-cultural differences and similarities when trying to meet the academic challenges of the citizens of the new millennium

The library as the main resource, led me to various information sources in the form of newspaper articles, periodicals, text books and web-based resources in order to explore the theories that elaborate on the foundations that underlie learning strategies and self-efficacy as the major concepts involved in the phenomenon of learning- achievement. The information search was conducted with the assistance of librarians and computer catalogues.

The theoretical perspectives for learning strategies, self-efficacy and achievement that were examined are found within Bandura's social-cognitive learning and motivation paradigm. Bandura's theory was chosen because its presentation of learning and motivation as triadic interactions among environment, personal characteristics and behaviour recognizes the complexity of real human experience the self as having potential to find fulfilment (Martin 2004:138; Pastorelli *et al.* 2001:87); rather than separating personal factors from environmental ones as the cognitive and behaviorist theories do.

1.3.1 The social cognitive learning theory of learning and motivation

The social cognitive learning theory that was conceptualised by Albert Bandura (Bandura 1977:191-215) is referred to as a major shift from his original behaviorist stance. The behaviorist theory with its stimulus-response-consequence model describes learning mainly as a learner's response to environmental stimuli and the probability of behaviour increase if the behaviour is reinforced. On the other hand, the cognitive theory learning depends on mental structures and processes.

Bandura's contention is that people's learning behaviour is neither driven solely by factors that reside within them (especially cognitions), nor are they totally controlled by

external forces to the extent of passively absorbing and responding to external stimuli without some form of recourse theory (Jahnke & Nowaczyk 1998:1; Sobel 2001:301). The social cognitive learning theory is therefore, a merger of the cognitive and the behaviorist learning theories (Jinks & Lorschbach 2003:113-115; Zimmerman 2000:82).

According to this theory, the learning process is attributed to the system called 'triadic reciprocal causality', or the dynamic interplay between those three influences shown (in Figure 1.1) below; and learners must be viewed as organisms that act and interact reciprocally in person, with environmental and behavioural influences to actively and pro-actively seek, regulate and transform information (Chemers, Hu & Garcia 2001:56.)

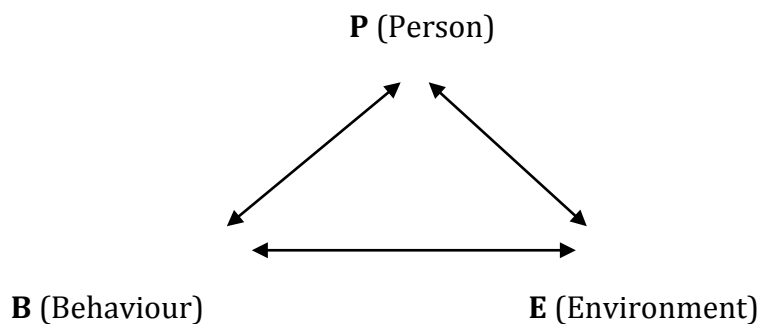


Figure 1.1 Model of triadic reciprocity or reciprocal determinism

According to Woolfolk (2010:17), while the social cognitive learning theory retains its emphasis on the role of other people such as models and teachers, the self, especially personal belief and 'self-regulated learning' have become one of the concept that have assumed great importance.

1.3.2 Self-regulated learning

Self-regulated learning describes a process in which learners are viewed as active participants who independently and consciously apply and regulate various learning strategies (cognitive, meta-cognitive, motivational, affective and behavioural) to reach their learning goals (Linnenbrink & Pintrich 2003:122-124; Lopez 2001: 49; Martin 2004:135).

bvOther key concepts in social cognitive theory, which are also regarded as major components of self-regulated learning process are learning strategies, self-efficacy beliefs and goals-setting (Alderman 1999: 138-140; Paris & Paris 2001: 90 & 94; Schunk & Pajares 2003:17; Sobel 2001:301).

1.3.3 Learning strategies

Bruning, Schraw, Norby and Ronning (2004:84) and Paris and Paris (2001:92) describe a good strategy-user as one who possesses a good repertoire of strategies, a broad knowledge-base, uses strategies automatically and knows where and when to use the strategies

A learning strategy is defined as a plan, cognition, affect, or behaviour that facilitates the processing, storage and retrieval of information from the environment during learning. As an essential part of self-regulated learning, the use of learning strategies (cognitive, meta-cognitive and affective), enhances learner-achievement and learner self-efficacy perceptions, thus promoting learner autonomy and lifelong learning (Mayer 1998:16-24; Monteith 2010:92, Muthukrisna 2010:145; Rickard 2004:65; Weinstein & Hume 1998:12).

1.3.4 Self-efficacy beliefs

Alongside strategy training, teachers are also urged to cultivate a sense of efficacy in their learners in order to increase their levels of achievement.

‘Self-efficacy perceptions’(including academic self-efficacy) are defined as personal beliefs about, or judgment of one’s capability to perform behaviours required for successfully bringing about specific outcomes (Bong 2002:133; Kitsantas 2002:102; Pastorelli, *et al.* 2001:87; Walker 2003:174; Woolfolk 2010:350).

Perceived self-efficacy beliefs are hypothesized to predict learner motivation by affecting the choices the learner makes and the effort he/she expends on learning tasks, the

persistence he/she exhibits even in the face of obstacles, and the courage to seek help whenever necessary.

Self-efficacy is also described as a mediator for the influence of other determinants of academic achievement, such as the learners' use of learning strategies and the formation of attribution patterns for failures and successes; and that when acting in concert with other common mechanisms of personal agency, it predicts academic outcomes (Martin 2004:137 - 138).

Research suggests that in contrast to learners with a lower sense of efficacy, learners with high efficacy perceptions are more likely to take initiative, set higher goals, use learning strategies, and monitor their progress in the learning environment. What is more, the highly efficacious learners achieve at a higher level than those with low or negative perceptions of themselves (Kitsanta 2002:102; Pajares & Graham 1999:124; Pastorelli, *et al.* 2001:87; Schunk 2003:161 Woolfolk 2010:351).

Against this background, and in order to focus on the topic, the main research question and related sub-questions are formulated in the ensuing section.

1.4 THE RESEARCH QUESTION

The above discussion of the research problem and the literature review have suggested the need to examine the influence of learning strategies on the self-efficacy and academic achievement of primary school learners. In order to conduct this study, specific activities and programmes needed to be carefully planned, aided by the research question, which were formulated as follows:

- What are the effects of learning strategies on learners' self-efficacy and academic achievement, and how can they be enhanced?

If this study confirms the significance of learning strategies, it will have implications for teachers and other interested parties. Additionally, the following secondary questions were indicated, namely:

- Is the acquisition and the deliberate implementation of learning strategies necessary and possible in the primary school?
- Does instruction in the use of learning strategies and self-efficacy improve learners' tendency to embrace learning strategies, while also cultivating their positive efficacy-perceptions?
- What activities and programmes are needed, and what can teachers do to promote the development of these programmes and to increase the knowledge and use of learning strategies in the primary school so as to enhance the learners' self-efficacy and academic achievement?
- Why do some children not make use of the strategies they have learned? What will aid the generalisation of the newly-acquired strategies?
- What recommendations can be made for further research about learning strategies?

1.5 THE AIMS OF THE STUDY

This study was undertaken with the following primary aims in mind, namely:

- To define, outline and explain learning strategies, self-efficacy and achievement;
- To establish the extent of the teachers' and the learners' knowledge and use of learning strategies;
- To design, develop and evaluate programmes and activities, as well as methods of implementation that will enable the researcher to examine the relationship between the learners' knowledge and the use of learning strategies, their perception of self-efficacy, and their academic performance;
- To investigate and outline what role the school community, particularly teachers, could play with regard to the development of their learners' strategic behaviour.

Moreover, this study aims encouraging debates among educators and bigger research projects involving more schools within the district to replicate the study and to test whether the outcomes of the study can be applied in other areas, especially in other township primary school classrooms in future.

1.6 THE RESEARCH HYPOTHESES

On account of the suggested relationship between self-efficacy, learning strategies and academic achievement, the following hypotheses were formulated:

Hypothesis One: Ho1: There is no relationship between the learning strategies and self-efficacy learners.

Ha1: There is a relationship between the learning strategies and self-efficacy of learners.

Hypothesis Two: Ho2: There is no relationship between self-efficacy and the academic achievement of primary school learners.

Ha2: There is a relationship between self-efficacy and academic achievement of primary school learners.

Hypothesis Three: Ho3: There is no relationship between the learning strategies and the academic achievement of learners in primary schools.

Ha3: There is a relationship between the learning strategies and the academic achievement of learners in primary schools.

Hypothesis Four: Ho4: There is no relationship among learning strategies, self-efficacy and academic achievement.

Ha4: There is a mutual relationship among learning strategies, self-efficacy and academic achievement.

Hypothesis Five: Ho5: Strategy-training does not improve learners' knowledge and use of learning strategies.

Ha5: Strategy-training improves learners' knowledge and use of learning strategies.

1.7 RESEARCH DESIGN

Based on the theories that deal with the merits of learning strategies and self-efficacy in achievement settings, the study attempted to test the above-stated hypotheses. Necessarily, the research design was drawn to guide the selection of the research methods, test subjects, measuring instruments, data-collection procedure, data analysis and the interpretation processes before the actual collection of the data (Collins *et al.* 2000: 122).

1.7.1 Research methods

This study adopted a combination of quantitative and qualitative approaches to explore the influence of learning strategies on the learners' self-efficacy and academic achievement respectively. The quasi-experimental method and action research were employed.

Quasi-experimental research is described as approximation of the condition of a true experimental design in a test-situation that involves the analysis of numerical data. Unlike the true experimental design, it does not permit the strict control of variables in the explanation of a cause-and-effect relationship between the independent variable and the dependent variable, especially where human beings are involved (Haslam & McGarty 1998:46; Collins, *et al.* 2000:132). These two conditions, which characterise this study, made the quasi- experimental a suitable method.

As in a true experimental design, the experimental group and the control group took part in the pre-test and the post-test sessions, but only the experimental group was exposed to the experimental treatment that involves strategy and self-efficacy training.

Action research is characterised as the collective enterprise aimed at the change, improvement and development of a specific condition in a situation. It entails research conducted by insiders, such as the teachers in a school situation to enable them to formulate and act upon their own concerns with the aim of improving their practice (Nieuwenhuis 2007:74). In the same way, this study was interested in improving the quality of teaching and learning in the primary school that had been selected for the learning-strategy training programme.

As a form of qualitative research, action research was conducted in this study by means observing the participants as they engage in tasks, but to give the researcher an opportunity to interact with the participants, semi structured and unstructured interviews were conducted in order to understand their feelings and experiences, which could not readily be put on paper.

For the purpose of performing action research, Zuber-Skerrit's (1995) four moments cyclical model of qualitative action research was adopted. This model of action research is presented as a process consisting of a series of spirals. Each spiral consists of a cycle of four different moments (or phases) of the investigation, namely planning, action, observation and reflection (Appendix). As part of the action, data analysis and interpretation were performed in this study (Holy, Arhar & Kasten 2005: 43, 44, 132; Zuber-Skerrit 1995:3 -29).

During the planning moment goals are set, plans are analysed and action plans for solving the problem at hand are drawn. The action moment involves implementation of the action plans in order to effect the changes the researcher and others want to see at the end of the investigation. The observation moment is concerned with monitoring and identifying problems, progress and other key issues. The reflection moment is the phase where researchers contemplate the challenges at the beginning and at the end of an investigation cycle (Zubber-Skerrit 1992:16).

The actions were continuously observed to see if the expected changes in the subjects or in their situation had occurred and to decide whether there was need for intervention or

not. Observation was followed by reflection as the participants thought about the programmes in which they participated and how it affected them. The research team also reflected on what took place, as the data was being recorded, analysed, interpreted, discussed and concluded with the consideration for future action (Zubber-Skerrit 1992:16).

Using two methods in conducting the research involved selecting the participants and the data-collection procedures (completing questionnaires and conducting interviews), as well as conducting the intervention procedures and analyzing and interpreting the results.

1.7.2 Sampling

According to Nieuwenhuis (2010:79), 'sampling' can be defined as "to select a small portion of the population for study."

A sample of one hundred and fifty-two (152) boys and girls, between 10 and 13 years, was selected from a population of three hundred (300) learners in the intermediate and senior phase (Grades 4 to 7) of a selected primary school in the Johannesburg Central District (or D 14) in the Gauteng Province. The selected school is a typical example of a public primary school found in any historically Black residential area of South Africa. The selection of the learners was based on their past records of underperformance and poor achievement (less than 40%).

The quota-sampling method was used so that each Grade was represented in the same proportion. One hundred and twenty learners (120) were allocated to the experimental group and 32 two learners formed the control group.

1.7.3 Statement of assumptions

When the research was designed, the following assumptions were formulated, namely:

- a. the relationship and significance of the variables being investigated will be revealed in terms of their contribution to the education practice;
- b. the subjects of investigation make up a good and sufficient sample;
- c. all the teachers want to see their learners achieve at the highest levels, and the learners themselves wish to succeed; therefore, any factor that purports to increase the achievement levels will interest them;
- d. the variables being investigated are easy to define and readily measurable;
- e. the learners in the experimental group will be able to work more independently and responsibly than those in the control group after the treatment;
- f. the teachers are capable of teaching the learning strategies and cultivating their learners' positive efficacy; and
- g. the perceptions are that Black primary school learners, as their counterparts in other parts of the world, are capable of learning and acquiring learning strategies when instructed, and of applying them, while also developing a sense of efficacy to learn effectively and successfully.

1.7.4 The research instruments

The following data collection instruments were used in this study and applied in the same sequence as presented in this list:

- a) questionnaires and inventories, such as:
 - the Learning and the Self-regulated Learning Interview Schedule (SRLIS) to provide questions for the interviews with learners in respect of their knowledge and use of learning strategies and their sense of efficacy
 - the Motivated Learning Strategy Questionnaire (MLSQ) to test the learners' use of learning strategies and their perceptions of self-efficacy; and
 - the Children's Self-Efficacy Scale (CPSES), which is another test for self-efficacy;

- (b) Texts and tests from the learners' grade learning areas;
 - Classroom performance tests
- (c) Models of lessons used for the purpose of instruction and intervention;
- (d) Workshops on experimentation and instruction; as well as educators' journals, diaries, observation checklists, and mark schedules.

1.8 DATA COLLECTION PROCEDURES

At the beginning part of the Planning moment of the cycle, the researcher convened a meeting with staff members to discuss the rationale for the research and to seek their collaboration to plan and implement the study. The five member research team agreed that:

- Permission would be sought from the relevant office of the Gauteng Department of Education for the study to be conducted in one of their schools (A--appendix A).
- The consent of the parents would be obtained by means of signed consent forms (Appendix B)
- The learners would be informed about the intention to conduct the research, and invited to participate (Appendix C).
- The control and the experimental groups would undergo an initial test to determine the level of their knowledge and the use of learning strategies, as well as their self-efficacy and class task performance levels.
- The learners would first meet with members of the research team for a one-on-one interview session. Thereafter, the questionnaires would be administered by the researcher with the help of the collaborating teachers, and the learners would respond by completing the questionnaires.
- For a period of ten (10) weeks the learners in the two groups would be involved in the daily school programme, to which intervention sessions would be added for

the experimental group, in order to increase their knowledge and use of learning strategies.

- The learners in the experimental group would observe the strategy modeling by the instructors who, in turn, would observe and monitor the process and the progress throughout the treatment period. The instructors particularly would observe the learners during practice sessions to ensure that they understood what was expected of them.
- At the end of the 10-week treatment period both groups would take part in the post-tests in order to evaluate the effectiveness of the intervention programme, especially the effectiveness of the learning strategies used by the experimental group in enhancing their perceptions of self-efficacy and their academic achievement.
- The scores would be recorded, analysed and interpreted. The findings would be reported with suggestions for further research, as well as for learning and teaching activities.

1.9 DATA ANALYSIS AND INTERPRETATION

The following statistical techniques were used for the analysis of the data:

Descriptive statistics were used for single variables (frequency distribution, means, standard and deviation) to show the differences between the 'before' and 'after' treatment scores.

Item analysis, consisting of factor analysis and the Cronbach coefficient alpha calculations, were used to determine the reliability of the pre- and post-intervention scores. 'Reliability' refers to the extent to which the instrument produced consistent measurements in similar conditions.

T-tests were performed to determine the effect of the intervention programme, especially the level of significance in the control and experimental group, and as a comparison, the groups' mean scores ($P < .001$ at 0.1% level of significance)

The level of the significance of the study was determined by the P-level or the level of probability, a critical value at the 5% level of confidence ($P > .05$) will also reflect the level of significance.

The Analysis of Variance (ANOVA) looked at the main effect and the interaction among variables when the mean scores of the different groups were considered.

1.10 ETHICAL MEASURES

The research took ethical considerations, which can also be described as 'trustworthiness', into account. For the purpose of this research, trustworthiness was defined in terms of the "true-value" of the findings (Petal 1998:68). The truthfulness, or true-value, of this study would be evaluated based on informed consent, confidentiality, reliability, validity and applicability.

Communication with the parents of the learners included a detailed explanation of the aims and objectives of the investigation. They were assured that strict confidentiality would be observed in order to protect the children's self-image or any damage that might result from the research process.

Care would be taken to record the information just as the participants presented it, so as to ensure the credibility of the outcomes. According to De Vos (1998:332), a qualitative study is credible when it represents such an accurate description and interpretation of human experience that people who share the experience would immediately recognise it. The participants were given the opportunity to respond in their own words during the interviews.

According to Strauss and Myburg (2000:64), the use of different data collection methods is a means of ensuring reliability and validity, respectively. Validity and reliability means that if the research was carried out again in similar circumstances, the same results would be obtained. 'Validity' means that the research measures what it intends to measure.

According to Strauss and Myburg (2000), applicability, as another form of trustworthiness, refers to the degree to which the study can be generalised or applied to other contexts, settings or groups. Because the study was restricted to only one selected primary school, with a particular purpose in mind, the findings and recommendations of this study will be restricted to this school until similar research has been carried out with a wider range of schools. That is why a range of methods, as mentioned previously, were used in this study.

The ethical measures are discussed in Chapter 4.

1.11 DELIMITATION OF THE STUDY

The study included a group of 152 boys and girls within the ages of 10 and thirteen years from one selected primary school, who were selected to participate in the programme. The selection of participants was done according to sampling strategies discussed in paragraph 1.7.2 above.

An exploration of relevant theories facilitated a close examination of the variables so that only strategies that are simple to medium in difficulty, and falling within the scope and grasp of young learners, were taught. The main focus was on cognitive strategies for reading-comprehension (repetition, prior knowledge activation, main idea summarisation, hierarchical text re-structuring), meta-cognitive (goal setting, monitoring through self-questioning), and affective strategies that are linked the cultivation of positive self-efficacy perceptions.

Since the language used in this research (English) was a second or third language for the participants in this study, their limited language proficiency demanded more time to complete their tests.

Only teachers in the intermediate and senior phases of the school were asked to assist in this project, as they had all direct interest in the intervention programme and indicated their concern about raising the achievement levels in the school.

The study presented certain limitations.

1.12 LIMITATIONS OF THE STUDY

Given the limited time within which the study had to be completed and the costs involved in conducting it, it was not possible to:

- Repeat the study in order to verify some of the details, especially the results and to move to the next cycle of the spiral as per Zuber-Skerrit's model.
- Conduct the study during contact time, due to an already full school time-Table and unavailability of learners during weekends because they had to help with housework or run errands for their parents. Thus, time in the afternoons was negotiated with the parents.
- Include the participation of other schools, because the nature of action research is such that the results are situation-specific.
- Exhaust all the learning strategies and consider all the learning areas and,
- Access questionnaires from previous studies conducted locally.

1.13 CLARIFICATION OF THE CONCEPTS

In this section the key concepts used in the study are explained.

1.13.1 Learning

The generally-used definition of 'learning' is that it is the process that brings about a relatively permanent change of behaviour as a result of experience (Herrmann, Yoder, Gruneberg & Payne 2006:86). Such a change has often been confused with development, which accounts for changes that come with growth and maturity (Hawley 2006:15). Other changes may be the result of disease, injury or drug-abuse (Hermann *et al.* 2006:149; Woolfolk 2010:198). Cognitive psychologists describe learning as an invisible, internal, neurological and mental process of changing raw data from the environment into knowledge; therefore it amounts to gaining knowledge (Taylor 2000: 1-2; 117-119).

Effective learning is the ideal situation towards which learning centers are incessantly working, so that learners can attain competent performance status. It is constructive, cumulative and optimal when self-organised, goal-oriented, situated, individually different, and usually collaborative (Montgomery 1998:49-50)

1.13.2 Academic achievement

In the Longman's Dictionary of Contemporary English (1987:4), academic means "concerning education, or based on subjects that develop the mind rather than the provision of skills". 'Achievement' is defined here as "attainment of success through effort or finishing or carrying out successfully" (1990:70). Academic achievement will, therefore, mean the attainment of educational success.

In practice, academic achievement describes the learner's ability to provide evidence (through assessment processes) that learning and understanding have taken place, and shows the level at which the learning has happened. By demonstrating - in different situations - certain integrated knowledge, skills, values and attitudes, the learner proves that he/she has met clearly defined criteria or learning outcomes (Review Committee on C2005 2000: 96-97; Steyn, Steyn & De Waal 2001:99).

1.13.3 Learning strategies

In sections 1.1 and 1.3.3 learning strategies were defined as systematic plans, thoughts, affect and/or behaviour that are consciously invoked by learners to facilitate knowledge acquisition, and to manage and regulate the information and the learning process. Cognitive learning strategies are associated with the actual processing of information coming from the environment, to transform it into knowledge. Therefore, cognitive strategies directly promote effective learning and academic achievement. Metacognitive strategies on the other hand, influence information-processing indirectly by regulating and supporting the cognitive information processing strategies (Hawley 2006:80; Lopez 2001:49; Weinstein & Hume 1998:120).

Researchers have identified the following general cognitive learning strategies: attention, rehearsal, elaboration and organisation. Meta-cognitive strategies such as planning, monitoring and self-evaluation, as well as affective, and motivational and support strategies (such as anxiety management), which help to start and maintain the learning effort, have also been identified (Lopez 2001:49; Monteith 2010:97, 98; Weinstein & Hume 1998:120).

According to Hartley (1998:47) and Woolfolk (2010:251), learning strategies are conceptualised in terms of the levels at which learners tend to reinforce the natural information-processing activities, namely by using the deep approach or the surface approach, or as processes that occur in stages in certain parts of the brain.

Recent years have witnessed an increased interest in comprehension strategies. Modern cognitive researchers have started building on the knowledge gained from earlier strategy instruction research to demonstrate that instruction in reading-comprehension is not only necessary, but it is also possible. Reading-comprehension is regarded as the core of effective learning and development, and is the most essential element in primary school education. Special emphasis was placed on providing instruction to primary (Pressley 2000, as quoted by Van Keer & Verhaegde 2005:292). Therefore, finding ways of teaching learners comprehension strategies so as to enable them to process texts in a manner that will facilitate understanding, retention and retrieval of information is considered to be crucial (Mayer 2001:86, Van Keer & Verhaegde 2005:291).

Abundant evidence exists indicating that learners can be successfully instructed on what strategies are (including reading-comprehension strategies), and how the strategies can be used, as well as providing strategy-value feedback about the benefits of learning strategies (Alderman 1999:51, 107; Walker 2003:175).

The emerging consensus among researchers is that the learners, who have been instructed in the use of appropriate self-regulatory learning strategies tend to maximize their understanding, achieve better academically and also experience enhanced efficacy levels than their mates who do not use learning strategies (Montgomery 1998:117, 136;

Schunk 2003:169; Walker 2003:175). Based on these findings, this study will investigate comprehension strategies.

Some of the key comprehension-strategies that were considered include prior knowledge activation, finding the main idea, summarization, self questioning, categorizing and hierarchical text-restructuring (Meyer & Poon 2001:141; Paris & Paris 2001:92).

1.13.4 Self-efficacy perceptions

Self-efficacy perceptions were defined in sections 1.1 and 1.3.4 as personal beliefs about, or judgment of one's capability or confidence to perform behaviours required in successfully bringing about specific outcomes (Kitsantas 2002:102; Pajares & Graham 1999:124; Pastorelli, *et al.* 2001:87; Walker 2003:174; Woolfolk 2010:350). In an academic context, self-efficacy refers to the learner's judgment of his/her ability to behave in a way necessary to accomplish the desired academic goals (Bong 2002:133).

Perceived self-efficacy beliefs are hypothesized to predict learner motivation by affecting the choices the learner makes the effort he/she expends on learning tasks, the persistence he/she exhibits even in the face of obstacles, and the courage to seek help whenever necessary. Self-efficacy is also described as a mediator for the influence of other determinants of academic achievement, such as the learners' use of learning strategies and the formation of attribution patterns for failures and successes; and that when acting in concert with other common mechanisms of personal agency, it predicts academic outcomes (Martin 2004:137-138).

Research suggests that in contrast to learners with a lower sense of efficacy, learners with high efficacy perceptions are more likely to take initiative, set higher goals, use learning strategies, and monitor their progress in the learning environment. What is more, the highly efficacious learners achieve at a higher level than those with low or negative perceptions of themselves (Kitsanta 2002:102; Pajares and Graham 1999:124; Pastorelli, *et al.* 2001:87; Schunk 2003:161).

Structures that aid the development of the individual's initial self-efficacy beliefs include the school and significant others, such as family and peers. The learners gain this sense of self-efficacy when the structures provide them with the opportunity to experience success or failure. However, a review of the literature revealed that efficacy formation is not automatic, but that it depends on the feedback learners obtain as they constantly appraise their own actual performances, the performances of credible others (vicarious or observational performances), verbal persuasions and physiological reactions (Pastorelli, *et al.* 2001:88; Woolfolk 2010:351).

Bong and Clark (1999:140) and Valentine, DuBois and Cooper (2004:112-113) caution about other self-beliefs that are similar to the self-efficacy construct in the literature that are associated with human achievement behavior, which need to be clarified and differentiated in order to facilitate the collection of data (*e.g.* self- concept, self-esteem, self-attribution). Details of these factors will be given in chapter 3.

This study will assess the cognitive line of theorising that suggests the teaching of effective learning strategies and encouraging learners to attribute their successes to their knowledge and to the use of such strategies. Alongside the latter theorising, the social cognitive theory will be examined in terms of how it explains the significance of learners' self-efficacy and how it can benefit from strategy-training (Kitsantas 2003:103; Schunk 2003:166-169; Schunk & Pajares 2003:25; Walker 2003:176).

1.13.5 Primary school learners

The South African Schools Act, Act 84 of 1996, defines a learner as any person (child or adult) who receives education or, according to the Act and the Universal Declaration of Human Rights, has to receive education.

A primary school is an institution where children receive the first stage of compulsory education, and is the first level of the General Education and Training Band (GET) in the National Qualifications Framework (NQF) of the country's Outcomes-based education system.

Primary school learners range between the ages of about six to thirteen years who, according to the NQF structure, belong in Reception class (Grade R), the Foundation (Grades 1-3), the Intermediate (Grades 4-6) and the Senior (Grade 7) phases. The phases are in the first level of the General Education and Training (GET) band of the National Qualifications Framework or NQF (EIC and IEB 1996:24-25; Vakalisa 2000:184).

The acronym Inter-Sen is used to refer to the combination of the intermediate phase and the senior phase of a primary school because of the inclusion of Grade 7 in the primary school instead of secondary schools. In the OBE Learning-Area Policy, it is stated that learners in the intermediate phase are beginning to understand relationships between material, events, circumstances and people; and that the consequences of such relationships. Schools are urged to consider this characteristic in their curriculum activities (DoE LO and Arts and Culture Policy 2002:5, 10). These were considered when the plans were made.

1.13.6 Township

In the ordinary sense, a township is a town and the settlement that surround it that have certain powers of local government. In the South African historical terms, a township refers to any (often under-developed) urban residential area created for separate non-White racial groups such as Coloureds, Indians, and migrant Black labourers. These groups lived as a socially integrated group in the so-called White people's towns and cities in the early days of the mining industry, before each group was allocated its own area (Brodie 2008:345).

The development of the areas for particular racial groups was an extension of the country's discrimination and segregation measures that started as regional attempts to secure residential and occupational land for the White proletariat. In different attempts by various governments the segregationist practices continued, though in very unsystematic ways. (Brodie 2008:146-149 & 308)

In spite of the advancement of human rights and the elimination of the racial discrimination of the early twentieth century, the restructuring of society along racial lines became entrenched in a more comprehensive and systematic way through legislation, such as the influx control measures, to keep poor rural outsiders out of White areas, while the Group Areas Act restricted the ownership and occupation of land to specific statutory groups (Welsh 2009:60-69).

It was during this period that the Black people were forcefully removed from the cities and towns to the far-away townships that had no facilities, in order to rezone some of the vacated places for occupation by White people. Sophiatown and District Six are typical examples of such relocation during the 1950s and 1960s, respectively (Brodie 2008:146).

In a later development, the apartheid government made another failed attempt to attract Blacks from the towns and cities by developing, and what came to be known as Bantustans or Homelands further away from towns and cities. Instead, large informal settlements mushroomed and became part of some townships and Bantustans.

In contrast to the formal urban settlements, which were under the control of local councils, 'informal settlements' denote the occupation of land on the outskirts of urban areas or the filling of empty spaces that have not been proclaimed as residential areas inside towns. Nowadays these settlements are found in rural areas as well. Such settlements are therefore unstructured and unorganized, in terms of the provision of services.

A repeal of the Group Areas Act in June 1991 led to the relatively rapid development and improvement of the old townships in urban renewal programmes. As part of the ANC government's reconstruction and development project, new township-like structures were created for low- income citizens after 1994 (Census S.A.2001:20-21).

The corollary of the racial separation by residential areas was the separate provision of services, including the provision of a segregated education system for the four racial groups. Black Education was wrenched from the control of Christian missionaries, following the introduction of the Bantu education system by the Bantu Education Act of 1953 (Brodie 2008:263; Welsh 2009:64-67).

This Bantu education system has remained the most inferior of the four racial groups mentioned above, in terms of the provision of resources, quality as well as the success rate of learners inside and outside school that led to unheeded calls for reform and the unrest of the mid-seventies and eighties, which in turn, speeded up the onset of the new dispensation in 1994, and the subsequent introduction of a non-racial education system which partly aimed at redressing the injustices of the previous regime (Brodie 2008:262-283, 146-262; Census 2001:20-21; Terreblance 2002:319-349).

However the legacy of inequality is still evident in township schools, where the quality of standard of teaching and learning are continuously being questioned and more and more calls for reform and for research to improve the education system are heard.

1.14 THE ORGANISATION OF THE STUDY

This study comprises the following six chapters:

In **Chapter One** the study was introduced by providing the broad background to the problem. The educational challenges of the millennium were discussed to highlight the need for the provision of quality, independent and lifelong learning as a means of envisioning a future of prosperity for all the citizens of the world. This was followed by a short exploration of the problem in the context of a local township school, which included a clear statement of the problem. The significance of the influence of learning strategies on self-efficacy and academic achievement was interrogated in the research questions, the aims, and the research hypotheses. The delimitations and limitations were stated to try to be realistic about the situation.

Chapter Two presented a review of the literature on learning strategies as a component of the cognitive theory of information processing. The working of the human brain and how the use of learning strategies is probably the way to go about improving the brain's performance especially during learning were explored, together with the role of teachers in promoting their learners' strategic behaviour for the enhancement of self-efficacy and academic achievement.

Several other influential theories in educational psychology were outlined as part of the conceptual framework needed for this study; especially in as far as they will guide the intervention programme.

Chapter Three presented literature into the role of the social-cognitive theory of self-efficacy as the motivator and mediator in achievement settings. More importantly, it indicated how self-efficacy is affected by an individual's knowledge and use of learning strategies.

Chapter Four outlined the research design, detailing the methods of sampling, data collection, instrumentation, and statistical tools that are deemed necessary for the study.

Chapter Five consists of an analysis and interpretation of the data, as well as a discussion of the study methods used, and the findings.

Chapter Six provided a synopsis of earlier chapters, the findings, the implications of the investigation and recommendations. It also presented the conclusions that were reached on the topic of learning strategies and their influence on the self-efficacy and the academic achievement of learners, particularly those attending a Black township primary school.

1.15 CONCLUDING REMARKS

This chapter provided the background to, and overview of the study topic. It took into consideration the aims and objectives of the investigation, as well as the design and methods to be applied in making a success of the study. The definition of the concepts

was done with the aim of enhancing the readers' understanding, while the limitations, the delimitations, as well as the ethical considerations have been taken into account and outlined. In Chapter two the literature on learning strategies and the impact they have on the learners' academic achievement will be discussed.

CHAPTER 2

THE LITERATURE REVIEW

2.1 INTRODUCTION

In an attempt to examine the relationship between learning strategies, self-efficacy beliefs and learner achievement, a review of literature on these variables was undertaken in order to explore related concepts and theories that underpin them. To this end, an overview of learning is provided under the following sub-topics: a definition of learning and learning achievement and an explanation of the theories of learning, focusing especially on cognitive and social-cognitive learning theories. This is followed by a detailed description of the learning strategy theory under the following subdivisions: a definition of 'learning strategies' and 'strategic learners', the broad categories of learning strategies and their roles, with examples in each category and the properties of learning strategies. Thereafter, issues of strategy application, and the teaching of strategies for learning and practice respectively are discussed, followed by an exposition of reasons why learners fail to use the strategies they have learned.

2.2 LEARNING AND ACHIEVEMENT: AN OVERVIEW

In order to understand learning strategies and academic achievement, the concepts learning and learning achievement need to be understood.

2.2.1 Defining the learning process, teaching and learning achievement

Despite the many varying views of learning in research, theory and practice, there appears to be a general agreement among theorists that learning is a relatively permanent change in behaviour caused by experience. In Section 1.13.1, it was indicated that the change brought about by learning should be differentiated from changes that are associated with spontaneous and species-specific growth, development and maturity, or change that is attributed to people's physical and emotional states or to the use of drugs

(French & Cleeremanz 2002:45; Hermann *et al.* 2006:149; Howe 1998:4-6; Mayer 2008:7; Siegler 2002:77; Woolfolk 210:198).

According to Kruger and Adams (2010:56) and Woolfolk (2010: 198 & 221), learning in the social cognitive domain is viewed as a function of the cognitive (mental) process of acquiring or altering knowledge and it may or may not be reflected immediately in change in behaviour. It is also considered to be influenced by other personal and environmental factors.

A learner is a person who is gaining knowledge, skills, values and attitudes. The South African Schools Act, Act No.84 of 1996 defines a learner as any person who receives education or has to receive education according to the Act and the Universal Declaration of Human Rights. For the purpose of this study, this learner is considered to be within the context of a school as a learning organisation under the supervision of a teacher and is influenced by his or her teaching.

A number of definitions for teaching exist; Lemmer and Badenhorst (1997:287) describe it as “an interpersonal, purposeful interactivity involving communication in order to help another person to learn or change the way in which they can or want to behave”. From this researcher’s perspective, teaching entails empowering learners to be able to know or to do things themselves. Therefore, teaching is said to be effective when the correct and desired responses to particular stimuli have been acquired, because teaching has to do with providing an appropriate context in which new knowledge can be interpreted.

In the post-1994 South African context, teaching has changed from the days of Bantu Education and rote learning to Outcome-based education (OBE) and to Curriculum 2005 and the current revised Curriculum. The latter aims at education that is learner-centered which develops independent and lifelong learners (Kruger & Adams 2010:4-5). Notwithstanding these changes some teachers have maintained the *status quo* as traditional teachers; others have developed and assumed new roles which are described as (RSA 2000):

- learning mediator and facilitator
- the interpreter of learning programmes and learning material
- a leader, administrator and manager
- a scholar, researcher and lifelong learner
- someone fulfilling a community, citizen, and pastoral role
- an assessor and,
- a learning area/ subject/ discipline/ phase specialist

For the purpose of this study, knowledge taught to learners and learning done by them is based on the educational psychology classification of learning goals, namely the cognitive and the social cognitive areas. Teachers have to play the roles mentioned above to make learning and teaching effective.

Learning and teaching are said to be effective when the learners are assessed and demonstrate proof that the expected learning outcomes have been achieved; that the learners are in a position to remember what they have learned; and are able show evidence that learning and understanding has taken place according to a specified performance criterion by applying those outcomes in real-life situations (Fraser 2010:205).

In this chapter learning is examined as a concept that is located within social-cognitive theory.

2.2.2 The development of the social-cognitive perspective of learning

An explanation of how the social cognitive conception of learning is developed is crucial when learning and the influence of learning strategies on learner self-efficacy and learner achievement are discussed.

2.2.2.1 The roots of social cognitive theory

The behaviorist and cognitive lineage of social cognitive learning theory has been discussed (par 1.31).

According to Bruning, Schraw, Norby and Ronning (2004:3-5) and Woolfolk (2010:220), the earlier perspective at the heart of learning and teaching for a very long time is the behaviorist theory, which proposed that human learning or knowledge was acquired through a stimulus-response relationship between the environment and the individual. Therefore, learning is regarded as a function of response repetition and reinforcement. Bruning *et al.* (2004: 5-13) and Woolfolk (2010:233) further indicate that the cognitive learning perspective deviated from the behaviorist view by asserting that learning should not be considered as an event that happens to passive learners, but rather involves someone who actively seeks and transforms stimuli from the environment into knowledge. The cognitive theory considers cognitions or mental structures and processes residing within the learner as being the sole contributors to human learning and functioning (Jahnke & Nowaczyk 1998:1; Sobel 2001:301; Woolfolk 2010:234).

From this point of view, learning is equated with the processing of information, understanding, problem-solving, critical thinking, memory retention, creation and retrieval (Gouws 2010:61). Therefore, in a learner-centered approach, cognitive researchers contend that less emphasis should be placed on teachers and teaching than on learning and learner accountability.

The cognitive objectives for learning are contained within three sub-groups: declarative knowledge refers to the recognition or recall of specific information, concepts, generalisations and broad theories. The second sub-division of educational objectives which represent procedural knowledge, involves intellectual skills and abilities, which consist of information-manipulation strategies such as comprehension monitoring, application, analysis, synthesis and evaluation. School curricula and test developments today base most of their activities on the principles of the cognitive theory. The third category of knowledge called conditional knowledge is about knowing when and how to use declarative and procedural knowledge (Bruning *et al.* 2004:37; Kellogg 2007:127).

2.2.2.2 Social-cognitive learning

In the previous paragraph social-cognitive theory (Bandura 1977) was ascribed to its behaviorist and cognitive parentage, and set within the triadic reciprocal interactions framework (Fig. 1.1). As such, some of the basic tenets of both theories were retained and merged into what was at first known as observational learning or social learning theory. Now it is referred to as social-cognitive learning theory (Kruger & Adams 2010: 56; Zimmerman & Schunk 2003:446).

In order to refocus our attention, the latter theory is summarised as follows. Within broader social cognitive theory, Bandura presented his 'triadic reciprocity' model (par.1.3.1), in order to demonstrate that learning, like all human behaviour, is acquired by means of the bi-directional and mutual influence of other behaviours, stimuli from the environment, and personal factors such as cognitions. (Schunk & Pajares 2000:15-16; Schunk *et al.* 2008:126).

As outlined in the previous chapter (sect. 1.3.1), self-regulation is one of Bandura's fundamental constructs within the larger social-cognitive theory.

a) Self-regulated learning

Section 1.3.1 described how in current educational research and practice there is an increasing awareness of self regulation as a major concept and emphasis on the importance of equipping learners with self-regulatory learning strategies, such as cognitive and meta-cognitive strategies as well as motivation as a means of enhancing their achievement outcomes and promoting learner-autonomy and accountability (Bruning *et al.* 2004:118; Paris & Paris 2001:89). Mayer *et al.* (2008:154) define self-regulated learning as "the processes whereby learners activate and sustain cognitions, behaviours and affects that are systematically oriented towards attainment of their goals."

This theory posits that self-regulated people tend to pro-actively organise and regulate their behaviours by strategically controlling the different cognitive, behavioural and

environmental factors involved during the processing of information, as they constructively attach meaning to their environments (Monteith 2010:91; Chan & Moore 2006:160; Kitsantas 2002:101-103).

Therefore, as the name implies, self-regulated learning involves independent and deliberate planning, control, monitoring and evaluation of strategic processes and environments adopted by the learners themselves in order to attain their intended learning goals. They also report a motivationally high self-efficacy and intrinsic task interest (Lopez 2001:49; Monteith 1998:118).

b) Learning as information-processing

The information-processing theory is one of the cornerstones of the cognitive learning theory. Information processing is described as the carrying out of mental operations, such as attention paying, perception as well as the transformation and the storage of information input from the environment into knowledge. It also involves the ability to later retrieve and use the newly transformed stimuli or knowledge (Eysenck 2001:2, 57; Gouws 2010:61; Osman 1998:870; Woofolk 2010:17 & 236).

Best (1999:54-55) asserts that the processing of information can be automatic or it can be under a person's control. In the latter case it requires that conscious effort be exerted by the person in the application of the learning strategies.

In cognitive education it has been common to use simulation models and metaphors to organise discussions on human cognition, information-processing and learning (Guenther 1998:17). A model consists of a combination and organisation of hypotheses or specific kinds of questions and answers, as well as various types of knowledge, into a system that constitutes a framework (Lehman, Laird & Rosenbloom 1998: 216).

Some of the models and theories that have generated great interest in the information-processing theory include the traditional memory-stage models, the depth of processing and the neural network or the connectionist models (Eysenck 2001:4-11, 157-204, 176; Guenther 1998:12-17, Jahnke & Nowaczyk 1998:103-124; Kellogg 2003:10 & 45).

i) *The Memory-stage Model*

The Memory-stage Model (Figure 2.1) is regarded as the earliest, most enduring and influential model of information-processing (Anderson 2000:172). It draws an analogy between the mind and the computer in describing the processing of information at several discreet stages (Eysenck 2001: 2,176; Guenther1998: 17; Kellogg 2003: 10).

According to Kellogg (2003:57) and Schunk (2004:140), information-processing in this model starts with recognition or perception, when the learner detects and assigns meaning to the environmental stimuli as and when it enters the sensory registers or channels (visual, auditory, aural and tactile), where it is briefly kept. If the material is unattended, it drops out or it decays because it only has limited duration of one to three seconds in this store.

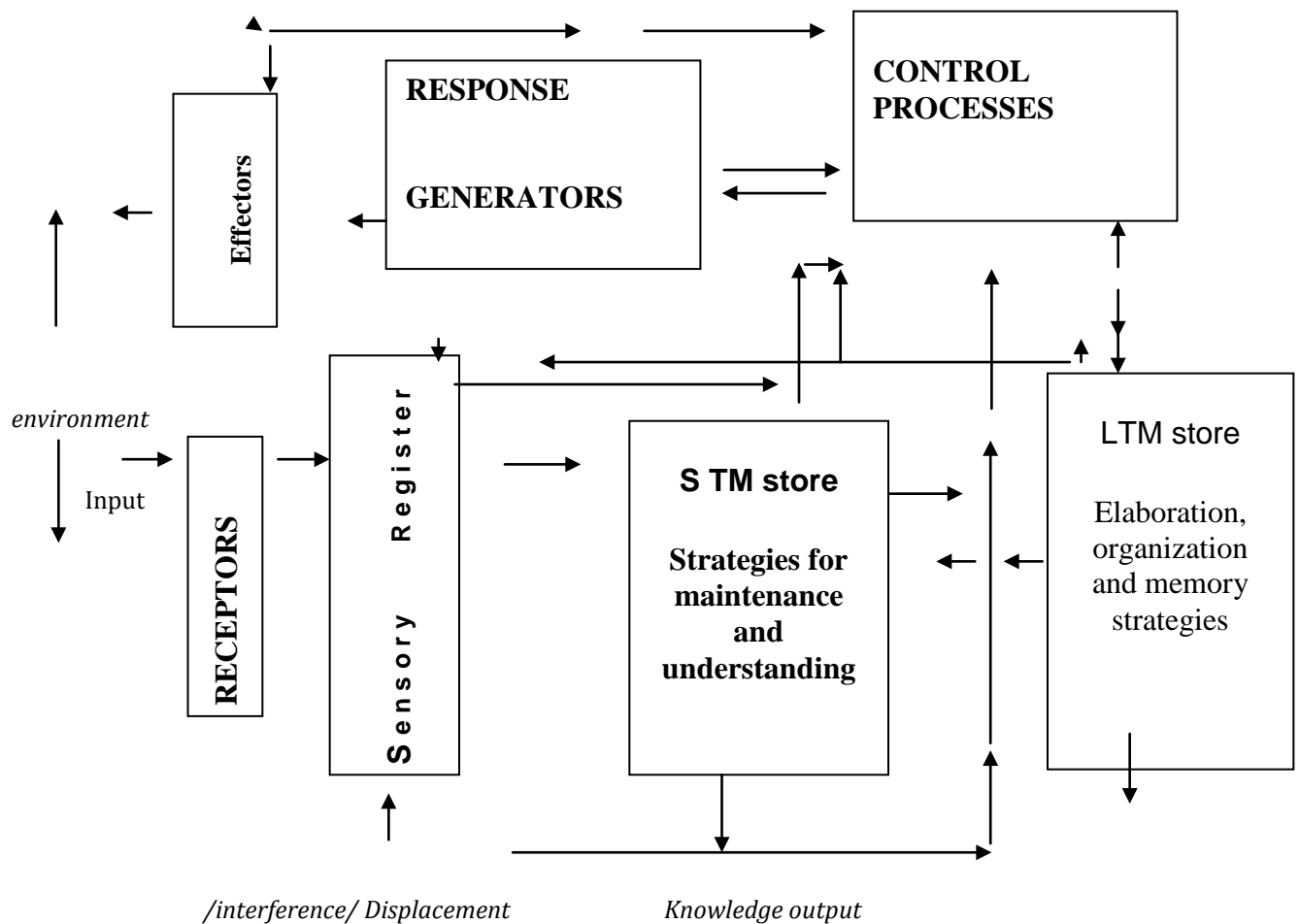


Figure 2.1: The adapted 1974 Multi-stage model of information processing
(Atkinson, Herman and Wescourt in: Hermann, *et al.* 2006:87)

Kellogg (2007:63) defines attention as the selection of salient sensory input, and focuses on it to the exclusion of others. Guenther (1998:47-51) and Parkins (2000:27-50) concur that, after perception in the sensory register, items that receive attention, are rehearsed in the short-term memory (or working memory), so that it can be temporarily retained there while it is being prepared to be transferred to the long-term memory (LTM) for further processing and storage.

The memory-stage theory posits that the limited capacity and duration of the short-term memory allows it to keep only about two to seven units of the semi-processed material

from the sensory stores, and for a limited period of about seven minutes (Best 1999:102; Bruning *et al.* 2004:26-27). As a result, it is easily overwhelmed by information-overload and fast processing, to the extent that it usually loses some of the information through interference and decay. In other words, the to-be-processed information can get mixed up, pushed aside or displaced, leading either to shallow processing of the information, or to difficulty in retrieving it later when it is needed (Best 1999:95; Eysenck 2001:193; Woolfolk 2010:253).

Two processes that are recommended for longer retention of the information in the short-term memory and its transfer to the long-term memory include rehearsal or repetition and chunking or combining several small units into one large unit (Jahnke & Nowaczyk 1998: 106; Kruger & Adams 2010:64; Mayer 1998:17; Woolfolk 2010:242).

What were perceived as the limitations and over-simplification of the STM led to the conception of the working memory (Eysenck 2001:166; Haberlandt, 1999:134-135). The 'working memory' is described as the conscious, accessible, multiple-component memory that is able to perform several parallel processing functions simultaneously (Anderson 2000:175-180; Eysenck 2001:166; Kellogg 2003:140).

The information that finally reaches the long-term memory (LTM) will be matched and integrated with schemas or stores of pre-existing knowledge, adding to the permanent store of knowledge an individual possesses (Best 999: 445; Jahnke & Nowaczyk 1998:224). Learning is believed to be complete or achieved when the learner is able to retrieve and recall the processed information (now newly-acquired knowledge) as well as to demonstrate it by adequately, appropriately and consistently applying it to life situations.

Memory theorists maintain that the information found in the LTM consists of all the knowledge an individual has accumulated in his/her lifetime. It is further argued that information stored in the LTM can neither drop out nor decay, as is the case in earlier stages; therefore, it is not forgotten. Groome, Esgate and Baker (1999: 7), Herrmann *et al.* (2006:112) and Schunk (2004:157) argue that information that is believed to have been

forgotten may in actual fact, have been rendered inaccessible and irretrievable by the use of faulty encoding processes and wrong retrieval strategies.

Skepticism about the stage-models has led to proposals for a revision of Levels and/or the Depth of the Processing Model (Anderson 2000:175; Eysenck 2001:176; Groome *et al.* 1999:111; Haberlandt 1999:75 & 134).

ii) The Levels or Depth of Processing Model

The contention against the Memory Stage Model was that it was overly concerned with storage-locations, instead of with the depth of processing that would help learners to derive more meaning from the information being transformed. Craik and Lockhart's (1972) depth of processing model presents three levels of processing or analysis. The levels, which are dimensional with each succession, are not necessarily sequential. Nevertheless, it is argued that the deeper and extensive the analysis of information, the more meaningful it becomes, the more long-lasting the memory and the easier the retrieval (Anderson 2000:175; Eysenck 2001:176-181; Groome, *et al.* 1999:111; Haberlandt 1999:75).

The first level of analysis, or the perceptual level, involves very shallow processing that makes individuals immediately aware of the stimuli impacting on them. At the second and deeper level or the feature analysis level, the stimuli are analysed in terms of structural features. At this level, the depth of stimuli-analysis is not enough to produce the desired meaningfulness of the information being processed. The information can be rendered more meaningful and retained in the memory for longer by rehearsing it (using elaborative rehearsal). At the deepest or semantic level, incoming information is linked to pre-existing knowledge to give it enhanced meaning. It becomes better understood and retained for a long period of time (Slotte & Lonka 1999: 2-3; Eysenck 2001:176-178).

The following scenario may shed light on the differences among the three levels of the model. At the perception level, a reader may just be aware of the word 'disgrace' in a text.

At the second or feature analysis level, he/she can analyse the structure of the word (e.g., what it looks like in terms of spelling or the font size), or he/she may identify other words with similar sounds, such as 'misplace' or 'displace'. At the semantic level, the reader can find the meaning of the word (*i.e.* loss of honour or respect). He/she may also think of other associations and semantic features, or he/she may think of people who are known to him/her who were 'disgraced' (e.g., a disgraced official), as well as the circumstances under which they suffered such 'disgrace'. Learners can also work at their understanding of the function of the word in language.

The replacement of traditional computer models with studies of animals gave information-processing studies a more credible biological base.

iii) The Neural-network Model

Modern neuro-biologists and technologists as well as cognitive theorists also attempted to understand and explain learning and information processing by using the network models. The neural network models, which are also called the connectionist or parallel distribution processing models, are simplified simulations that mimic what is currently believed to be the actual complex structure and functioning of the living of the human nervous system and brain (Haberlandt 1999:11; Jahnke & Nowaczek 1998:124-127; Kellogg 2003:44; Sobel 2001:305).

The neural network model describes learning as a process that involves the formation of connections or associations between sensory perception of stimuli or events and neural impulses that manifest themselves through behaviour. Each connection is an idealized synapse while each node is an idealized neuron. The network model does not reflect any of the complexities of the real nodes and synapses.

Anatomically, information-processing is believed to start with attention followed by the perception of stimuli-input by neurons that are found in the sensory organs. The stimuli, which have been transformed into electrical impulses, are transmitted to the terminal buttons of the neurons by axons and dendrites. In turn, the terminal buttons transmit

the electrical impulses across the synaptic cleft to neighbouring neurons where patterns of simultaneous excitation or inhibition are triggered (Anderson 2000:16-21).

The resulting electro-chemical transmitters that cause the neurons to fire, determining the flow of information through the complex network of nerve cells and neurons. It is assumed that the repeated experiencing of the stimuli reinforces the excitation / inhibition link, increases or decreases the size and number of the synapses, the neurotransmitters, as well as the responsiveness of the cells of the hippocampus, to indicate that learning has occurred (Anderson 2000:16-21; Haberlandt 1999:55; Hermann *et al.* 2006: 86).

iv) *The convergence of theories and models*

Research on learning and memory has advanced since the days of the stage model theories. The models presented above are some of the several mutually-contradictory views of information processing. In spite of their conflicting ideas about how information is processed and how the processes are explained, they manifest certain inherent similarities that are reflected by the continued use of certain ideas and concepts that motivated earlier theories (Anderson 2000:172).

The emerging confirmatory evidence reveals that, in ways that are more or less similar to those proposed in some of the earlier models, evidence in later models points to the existence of memory categories located in the brain (Groome, *et al.* 1999:121; Guenther 1998:14; Sobel 2001:67,121; Zola & Squire 2000:485; Parkins 2000:103):

The continuity of ideas about memory is highlighted by Anderson (2000:172) who speaks about “the rise and fall of the STM”. Anderson also links working memory tasks with frontal cortex tasks (Anderson 2000:178). Zola and Squire (2000:488-497) describe the ‘hippocampal regions placed at the end of the processing hierarchy of the medial temporal lobe of the brain’ that are associated with the depth of processing and recall respectively. The brain’s hippocampus is associated with declarative knowledge and the LTM storage almost resembles the activities described in the Levels of Processing Model.

Markowitsch (2000:472-473) associates the storage of transient information input with the cortical area, in a way similar to that of the short term memory stages of the traditional models.

Above all, cognitive researchers agree about the centrality of thought processes in human action (Desforges & Fox 2002:66). They maintain that in educational practice there is a need for theories of the mind that explain the conscious engagement of processes pertaining to the transformation of information. It is generally acknowledged that such processes should be brought to the attention of teachers (Woolfolk 2010:309), so that they can understand the principles underpinning the theories of learning strategies and thus empower their learners with effective self-regulatory strategies that will help to maximize their learning efforts (Hermann *et al.* 2006:62; Kellogg 2003:158; Schneider & Lockl 2002:299).

2.3 LEARNING STRATEGIES AND ACADEMIC ACHIEVEMENT

During the past two or three decades, cognitive researchers and theorists have focused much of their attention on meta-memory and meta-strategy as significant knowledge required for the promotion of self-regulated learning and achievement (Mayer 1998:16; Schneider & Lockl 2002:227).

Meta-memory refers to an individual's knowledge about his or her memory, and about the learning strategies they possess. Meta-strategic knowledge includes knowledge of strategies: the different categories, their role and when and how they can be used (Luvel, Torbeyns & Verchaffel 2003:246; Rosencwajg 2003:282).

2.3.1 Defining learning strategies and a strategic learner

Learning strategies were partly defined in 1.3.3 as systematic plans involving complex chains of actions and thoughts that are ordered according to set goals or task-demands to help learners to effectively encode information coming from the environment to change it into knowledge. Furthermore, learning strategies enable the learners to

retrieve and to apply such newly-formed knowledge in their daily lives (Herrmann *et al.* 2006:103; Lopez 2001: 50, Mayer 2001:86; Simmons & Kameenui 1998:304, 349).

The most fundamental characteristic of a strategic learner is the knowledge of oneself as a learner and of the learning task and the learning strategies and one's possession of a good repertoire of such strategies, knowing how, when and where to use them (Kruger & Adams 2010:94 & Otero 1998:148).

Strategic learners are also known to believe in their personal efficacy and positive attributions. They also take more responsibility for their learning by appropriately regulating their activities. As a result, strategic learners perform their tasks more efficiently and achieve at a higher level than learners who do not use strategies to learn. This highlights the difference between expert learners from non-expert learners (Anderson 2000:292; Miechenbaum & Biemiller 1998:12-24; Pintrich 2001:150).

2.3.2 Previous research on the learning strategies and achievement relationship

The question on whether primary school learners are capable of acquiring strategic knowledge and are able to apply learning strategies when learning by reading is addressed by the following few cases.

A longitudinal study undertaken by Chan and Moore (2006:164-181) showed that primary school learners who were instructed in strategy-use subsequently achieved at higher levels than those who were not trained, and that such achievement enhanced beliefs in personal control over their academic successes. Similar results were obtained from studies conducted by Carriedo and Alonso-Tapia (1996:128-153) who assessed the ability of Grade 6-8 learners to identify the main idea in a text and to use comprehension strategies, after receiving instruction from teachers who were trained in teaching the process of identifying main ideas. The experimental group's post-test performance was better than that of the control group.

Rose and his colleagues assessed the effects of imagery-based remedial reading-comprehension instruction on the reading comprehension of Grade 4 learners. The study

revealed a direct causal link between instruction using drama components (such as analogies, meaning-based memory and elaboration) and improved reading comprehension in the experimental group's post-test results (Rose *et al.* 2000:58-61).

In their investigation regarding the use of hierarchical text structure by young and older learners, Meyer and Poon (2001:148) reported that the learners' comprehension and remembering of information from the text improved. Improved results were also reported in Van Meter's (2001:131-139) examination of drawing construction used by Grade 5 learners as a strategy for learning.

Mayer (2001:86) summarises the research findings on the teaching of learning strategies for learning lists, comprehension of text and for solving problems in primary school. All these investigations show significantly improved post intervention performance.

The strategy instruction to 2nd and 5th Graders within same age peer groups and across-age peer groups conducted by van Keer and Verhaegde (2005:308) indicated significantly better performance by the experimental groups compared to the performance of the control groups although the effects in 2nd Grade did not last after the program was finished, while in Grade 5 the effects of the intervention programme lasted for a minimum of six months.

2.3.3 The categories of learning strategies and their roles in promoting effective learning

For learners to process information optimally when they learn, a good knowledge of different types of learning strategies is required.

In the following section the various categories of learning strategies and their roles will be explored. Learning strategies are categorized into cognitive learning strategies, metacognitive strategies and resource and the affective-motivational management strategies (Alderman 1999:126-128; Hawley 2006: 84-85; Lopez 2001: 49; Monteith 1997:97-100).

a) Cognitive learning strategies

Cognitive learning strategies are those that work directly on the incoming information while it is being transformed into knowledge. They affect the manner in which learners select, acquire, organize or integrate new information so that it can become meaningful and applicable as knowledge. At the required time the strategies ensure the retrieval of knowledge from where it was stored as long-term memory, so that it can be applied in an individual's life. Examples of cognitive learning strategies where the learner can engage in the stimulus-to-knowledge transformation include attention, rehearsal, elaboration and organisation (Alderman 1999:126; Kruger & Adams 2010:97; Mayer 2008:390-426; Monteith 1997:97).

i) Attention

At the onset of the learning process, learners have to pay attention to relevant environmental stimuli. Attention means screening out some external stimuli and becoming focused on the information one has selected for processing. It also refers to the "concentration of mental resources on a particular process" (Kellogg 2003:89; Woolfolk 2010:239). Examples of strategies that help learners to focus their attention on appropriate features of the learning tasks include the creation of expectation, or making prediction, underlining, or highlighting the relevant information in a different colour or boldface (Lopez 2001:50; Woolfolk 2010:240).

Once attention has been paid to the relevant features of the task, the learner must encode the material to ensure that the information is retained and later retrieved. The simplest strategies for the restructuring of information are the repetition strategies or rehearsal strategies (Lopez 2001:50).

ii) Rehearsal

According to Kellogg (2003: 156), rehearsal is a strategy used for deliberately trying to keep information in the STM by repeating it. Kellogg and Eysenck (2001:176-177)

distinguish between *maintenance* rehearsal and *elaborative* rehearsal. Alderman (1999:126) differentiates between basic rehearsal and complex rehearsal.

On the one hand, *maintenance* rehearsal, like basic rehearsal for tasks, is conceptualised as the recycling or repetition and recitation of information in order to keep it within the STM for later recall. It is associated with rote-learning and often with no understanding of the learning content, because it is ineffective in encoding and storing information. Nonetheless, it helps learners to acquire the basic knowledge on which more advanced knowledge is built (e.g., sequencing events and items, multiplication tables, and letters of the alphabet). Examples of the maintenance rehearsal strategies are copying *verbatim* notes, and repeating or reciting information (Van der Vyver 2000:39).

On the other hand, *elaborative* rehearsal is regarded as a relatively more effective strategy for the facilitation of maintenance, and for the understanding of acquired information. What is implied is that in the latter strategy, the learner participates more actively by making internal connections between the information being processed and their prior knowledge which exists in the LTM as he/she is rehearsing. As a result of the linkage, the newly gained information acquires a deeper meaning and becomes more understandable, easy to retain in, and to retrieve from the memory through this elaboration process (Eysenck 2001:176; Kellogg 2003:156).

Examples of elaborative rehearsal are the re-reading of text, using mnemonic devices, and highlighting, underlining and spontaneous note-taking, or the summary of notes. In all of these examples, learners actively pay attention to the salient features of the learning material before transferring it to the STM to be analysed.

iii) Elaboration strategies

The previous paragraph outlined the rationale behind the employment of elaboration strategies on rehearsal tasks to link the new information to pre-existing knowledge. Elaboration-strategies can also be used for basic tasks in the form of imagery and paired associate learning (Alderman 1999: 126, Eysenck 2001:176; Howe 1998: 10).

Elaboration for complex tasks or deeper-level processing, diagrams, paraphrasing, summarising, generative note-taking, analogies, comparing and contrasting, as well as problem-solving are some of the elaboration strategies teachers can use to integrate the new information with knowledge already stored in the learners' LTM so that they can gain a deeper level of understanding of the information (Anderson 2000:247,448; Lopez 2000:50; Kellogg 2001:453).

iv) Organisation strategies

According to Kruger and Adams (2010:97), strategic learners also restructure information into another format that is easier to understand by using organisation strategies. Thus, the new information is made to fit into, and becomes part of the existing network or knowledge-schema in the LTM, and is made easily accessible for later recall. Examples of organization for basic tasks are chunking, clustering and ordering (Lehman *et al.* 1998: 240–245). Popular strategies for the organisation of information for complex tasks include functions such as outlining, identifying the main ideas in a text, creating concept hierarchies, maps and line diagrams. (Anderson 2000:132-141; Gunning 2005:47, 240; Van Loggerenberg 2000:32).

According to Alderman (1999:127), the cognitive strategies that are suitable for primary school learners include: summarisation, mental imagery, story grammar, question answering and prior knowledge activation.

Knowledge and use of strategies by learners include the use of meta-cognitive learning strategies.

b) Meta-cognitive strategies

Meta-cognition refers to an individual's thoughts, knowledge and beliefs about his/her own cognitive processes, as well as about his or her personal, contextual and task characteristics (Mayer 2008:108; Woolfolk 2010:270).

Learners have to manage all the categories of knowledge in order to help create a favorable emotional and motivational climate within which they) set learning goals, plan, monitor (including comprehension monitoring) their learning progress, as well as take the necessary corrective action and to cue retrieval of information from memory. Based on this knowledge, learners can direct and coordinate their cognitive, motivational and affective processes (Alderman 1999:126; Chan & Moore 2006: 163; Hacker 1998:2)

i) Planning

Planning involves the advance decision-making about physical and mental activities that are needed to meet one's performance goals, thus taking control whilst anticipating the outcomes (Sternberg 1998:54). Planning activities include task analysis, goal-setting and a deliberate selection of suitable conditions and activities for learning (Sitko 1998:99-100). To be successful, the plans have to be monitored all the time.

ii) Monitoring and self-regulation

Monitoring (including comprehension monitoring) and self-regulation are highly interactive processes that are all goal-oriented. Monitoring' refers to an individual's continuous judgment, noting, evaluation and re-adjustment of his/her processes in relation to his/her goals, thus measuring them against progress made towards the attainment of set goals. Some of the self-regulatory activities are self-discipline, concentration, effort-exertion, determination, persistence, self-reflection or evaluation and support or social assistance (Alderman 1999:132; Hertzog 2002:169; Van Oostendorp & Elshout-Mohr 1999:284; Perfect & Schwartz 2003:277-278; Son & Schwartz 2002:4).

c) Affective-motivational and support strategies

The relationship between thinking and affect is well-documented (Forgas 1999; Lewis 1999: 125). Affective-motivational and support strategies help to energize and maintain the learning processes, including strategy-use. According to Tangney (1999:541) and Van Keer and Verhaegde (2003:225), positive experiences of success generate positive

feelings such as pride, positive attribution patterns, a good sense of efficacy, and confidence, that promote adaptive behaviour towards the attainment of learning goals.

In contrast, learners who experience failure develop feelings of anxiety, sadness, and sometimes, hopelessness, even to the extent of feeling helpless and inclining toward task-avoidance and other mal-adaptive behaviour (Averill 1999:777; Forgas 1999:591; Isen 1999:521-36; Lewis 1999:125).

More will be mentioned about these strategies when learner-self-efficacy is discussed in Chapter 3.

d) The focus of this study

This study is concerned with learning strategies that facilitate text comprehension and recall. Many researchers agree that a critical goal in education is to facilitate learning through reading, and that learners should be equipped with relevant reading-comprehension strategies to enhance their processing, their understanding, their retention and their retrieval of information (Meyer & Poon 2001:141; Van Keer & Verhaegde 2005:292).

Some comprehension-strategies derive from the same cognitive, meta-cognitive, motivational and emotional strategies that were discussed in the foregoing paragraphs. According to Hacker (1998:171-173), comprehension monitoring involves the use of monitoring strategies and control strategies. Monitoring strategies include re-reading difficult passages, looking back at prior texts, comparing several positions and predicting upcoming information. Examples of control strategies are: summarisation, clarifying text by using other sources and completing or correcting text information.

The cognitive learning strategies that were considered for examination included the following:

- i) Rehearsal strategies to keep information alive in the working memory (e.g. underlining and repeating text).

- ii) Organising or transforming information into format that is easy to understand and creating some schema that will provide structure for the information (e.g. the use of hierarchical text structures and summarizing the main ideas).
- iii) Elaborating or adding on to the new information by linking it up with information that is already known (e.g. predicting the text, prior knowledge-activation by pre-reading, the use of imagery, and question-generating to elicit the learner's knowledge of the study material).

Meta-cognitive strategies include:

- i) goal-setting to focus attention, effort and motivation on achieving the expected outcomes;
- ii) Planning to mobilize all the resources (e.g. learning strategies) needed for completing the task.
- iii) comprehension-monitoring skills, such as self-questioning and re-reading.

Motivational and emotional strategies will include self-efficacy beliefs, attitudes values and relevant feedback as forms of motivation.

The provision of non-threatening environmental conditions will also be considered in this study (Cain, Oakhill & Bryant 2004:31; Hawley 2006:84-85; Van Keer & Verhaegde 2005:292).

2.3.4 Properties of learning strategies

Otero (1998:148) insists that for learners to select appropriate strategies to meet the demands of their tasks, they need to be aware of, and monitor their own characteristics (self-characteristics), the characteristics of the task, as well as those of the strategies they are selecting. A few of the characteristics belonging to learning-strategies will be mentioned in the following paragraph.

Firstly, all learning strategies comprise a sequence of *goal-directed* operations. Therefore, they are used to meet the learners' goals. Secondly, working towards a goal requires that strategies be *consciously/deliberately/intentionally* invoked, because the user acknowledges their usefulness and relevance to the demands of the task. They thus involve *agency* and *control*, not just mindless compliance. Thirdly, the goal-directness of strategies also implies that they are *situation-specific*, and that they must be *selectively applied*. The fourth and fifth points are, that for actions that involve multiple, highly interactive steps, active selection and the use of strategies requires some energy and effort, which translates into decisions on how *effort will be expended*, especially on the behavioural and mental operations, inclusive of *planning* and *monitoring*.

It is assumed that a strategy-user does not only possess the know-how (skills), but he/she also has the *motivation* (will) to exert the necessary effort to maximize, and make *transfer* of learning strategies to diverse tasks and contexts *automatic* (Best 1999:443; Bray, Reilly, Fletcher, Huffman, Grupe, Villa & Anumoth 1998:10; Guavain 2001:105; Gunning 2005:279; Mayer 2008:390). Learners must bear in mind that as with mental processes, learning strategies are internal operations that lie within the former.

2.4 STRATEGY APPLICATION AND CLASSROOM TRENDS

A growing body of literature suggests that an empirical link between learners' use of learning strategies and their academic achievement (Bruning *et al.* 2004:85); and that instructing the learners in the use of learning strategies is possible and crucial for their learning success (Mayer 2001:87).

Mayer (2001:86) and Bruning *et al.* (2004:88) echo the sentiments of many researchers by suggesting that teachers should 'skillfully' teach learning strategies to their learners while psychologists should strive for provision of good theoretical base for education.

2.4.1 The teaching of strategies for learning and transfer

This study focuses on the teaching of reading-comprehension by drawing on the different strategies that were discussed above.

A number of teaching methods has been proposed. However, not all can be dealt with in this study. The instructional methods used in this training course are eclectic, although the structure of the programme is basically an adaptation of the three-stage model of learners and teachers' complementary roles suggested by Meichenbaum and Biemiller (1998:96-101), consisting of the acquisition, consolidation and consultation stages. The model has been adapted to include the orientation motivation and planning and the actual instruction stages.

a) Orientation motivation and planning

As part of planning, the learners' needs for training are identified during task-engagement or assessment and programmes are drawn to indicate how the needs will be met. By allowing learners to have sessions of self-reflection and verbalization, the instructor can draw the learners' attention to their own way of dealing with tasks, make them aware of strategic learning options, and motivate them to practise using strategies so that they can learn effectively and attain their goals.

b) Actual instruction and acquisition

Learners should be informed about the nature of strategies, the learning targeted for instruction and the rationale for selecting them. The planned instruction can take the form of explanations, demonstrations and modeling regarding how, why, when and where a particular strategy may be used (Meichenbaum & Biemiller 1998:118).

c) Consolidation

It is recommended that learners be provided with adequately sequenced exercises for practising and scaffolding in order to consolidate the training activities. If well planned, deliberate practice and monitoring ensure that strategy-use is retained and transferred to relevant areas of application, that the newly-acquired strategies are assimilated and that an appropriately relaxed and positive atmosphere leading to anxiety reduction is created (Meichenbaum & Biemiller 1998: 138-158).

d) Consultation

Lastly, at a consultative stage learners demonstrate their understanding by describing the use of the new strategy, and justify their reasoning to themselves and others by giving feedback, tutoring, collaborating, assessing and participating in cooperative learning (Meichenbaum & Biemiller 1998:158- 185). Teachers are also cautioned not to aim at merely teaching strategies, but to ensure the retention, transferability and the ability to generalise such strategies (Meichenbaum & Biemiller 1998:192).

While retention ensures that the strategies are kept as part of the individual's repertoire transferability means application of such strategies to new tasks and contexts will make learning effective at all times and without too much dependence on teachers (Davidson & Sternberg 1998: 56, Meichenbaum & Biemiller 1998:87; Woolfolk 2010:295-298).

Factors that enhance positive transfer include the structural and content similarities between tasks, similar demand for problems solutions in the tasks and the learner's cognitive ability (Kimball & Holyoak 2000:110-114).

Other issues of instruction (not within the scope of this study) that are being debated pertain to the question of whether the development of programs for instruction in the use of strategies is justified or not and whether instruction should be for general use or domain-specific, and whether it must be embedded or detached. Intervention programs are considered an imperative in the education systems that seek to raise the standards of education and the achievement levels of its citizens.

From the many arguments that theorists have advanced, it can be concluded that training learners in domain-specific strategies is favored above general strategy training in the initial stages. Similarly, embedded programmes of instruction are preferred over detached ones.

2.4.2 The reasons why learners fail to use learning strategies after instruction

Theorists insist that deliberate strategy training should be accompanied by emphasis on strategy-transfer (Lopez 2001:50; Hager 1999:313; Miechenbaum & Biemiller 1998:19 & 87; Sweller 2003:244)

Some researchers contend that, despite the overwhelming empirical data correlating learners' strategy repertoire and use with academic achievement and self-efficacy, many learners are not able to command the necessary strategies when learning (Dulonsky & Hertzog 1998:261; Schneider & Lockl 2002: 158; Lopez 2001:5). Some of the reasons why learners fail to use leaning strategies after receiving instruction include the following:

a) Strategies for specific domain

The use of the strategies is sometimes limited to the particular settings only, and is not transferable to situations outside those situations; resulting in minimal transfer (Dulonsky & Hertzog 1998:261).

b) Inadequate strategic knowledge and limited strategy use

Decorte (2003:26) adds other factors that are believed to militate against the use of learning strategies including inadequate strategy knowledge, inadequate knowledge base, poor cognitive monitoring, primitive routines, negative attribution patterns, and classroom goals that do not support the use of strategies.

c) Inadequate knowledge base

Brown and Craik (2000:98) maintain that if the learner's background knowledge or prior knowledge is inadequate, they will have insufficient mental framework to attach incoming information to when encoding, retrieving and applying the new and old knowledge to facilitate strategic learning.

d) Classroom climate

De Jager and Ferreira (2003:187) argue that many teachers may not be familiar with information-processing skills/strategies, and therefore do not pay attention to the cultivation of such processes. At the same time, De Jager and Ferreira concede that there is a possibility that some teachers may be developing the strategies without realizing that they are doing it. Alderman (1999:80) concurs that some of the classroom goals and primitive routines promoted by some teachers do not support the use and generalisation of any newly acquired knowledge.

Alderman (1999:80), supported by Chan and Moore (2001:162) and Decorte (2003:23), asserts that motivational and affective factors, such as causal attribution patterns and self-efficacy beliefs, anxiety, as well as other outcomes and value expectations, are a few of the things that can promote or thwart the level of commitment in the use of strategies. It starts with the learner's good or poor show of capability and confidence to use the strategies, as well as a positive or negative perception of the value of learning material and of the strategies they have acquired.

Other theorists further point out that those learners who attribute failure to uncontrollable or unstable external factors, such as luck, or stable internal factors like intelligence, are unlikely to invoke the learning strategies they know because they think such strategies will not change their situation (Chemers *et al.* 2001:56; Chan & Moore 2006:162; Pintrich & Schunk 2000:164; Schunk & Pajares 2003:17; Walker 2003: 174).

Alderman (1999:134), and Miechenbaum and Biemiller (1998:19) agree that sometimes and for varying reasons, learners fail to monitor the successes or failures of their cognitive processes more accurately and on a continuous basis. This leaves them ignorant about the options of strategies they have at their disposal, and it also makes it impossible for them to assess the effectiveness of their chosen strategies. In the absence of the information provided by the monitoring process, they get discouraged from any further effort of using strategies.

In this programme there the importance of transfer was repeatedly emphasised.

2.5 CONCLUDING REMARKS

What came to the fore in this literature review of the cognitive and the social-cognitive learning theories was the emphasis placed on the knowledge and use of the various forms and categories of learning strategies as crucial determinants of learner success and autonomy, as well as for the raised education standards.

Based thereon, researchers in educational psychology also insist on deliberate learning strategies training as a form of promoting the knowledge of teachers and curriculum developers, as well as on developing the learners' knowledge and encourage their use of learning strategies, especially at primary school level.

In chapter 3 the survey of the literature covers learners' use of learning strategies and their indirect influence on their achievement by cultivating positive self-efficacy perceptions for learning and motivation.

CHAPTER 3

THE INFLUENCE OF LEARNING STRATEGIES ON LEARNERS' SELF-EFFICACY BELIEFS

3.1 INTRODUCTION

The literature review in the previous chapter presented research conducted over a number of years, which acknowledge the important role of learners' knowledge and use of cognitive and meta-cognitive strategies as an essential ingredient for active, autonomous and successful learning.

Concurrently the theory of motivation posits that the intentional and effortful nature of strategic learning requires that learners should be well-motivated if they are to succeed in their efforts to learn (Chan & Moore 2006:163; Schunk 2003:159; Pintrich & Schunk 2002:143, Watkins & Coffey 2004:110). Thus, motivation is what teachers and learners should aim at in their practice.

Contemporary motivation theories focus more attention on the contribution of self-beliefs as well as other cognitive and affective factors on human agency and academic achievement (Bong & Clark 1999: 129- 141; Martin 2004:135; Pastorelli *et al.* 2001: 87; Valentine, Dubois & Cooper 2004:111 & 113).

Personal agency is defined as the capability of an individual to make choices and act on those choices in ways that make a difference in their lives (Baumeister 1999:12; Bandura, Barbanelli, Caprara & Pastorelli 1996:1206; Pajares & Graham 1999:124).

The self-belief under investigation in this study is the self-efficacy perceptions. Like other positive self-beliefs in the learning situation, self-efficacy perceptions are considered to be crucial in determining the effectiveness and efficiency of learners during their

engagement in learning tasks, ultimately improving the levels at which they achieve their academic goals.

Conversely, negative self-beliefs are said to be less likely to lead to successful academic performance (Jinks & Lorschbach 2003:113; Kitsantas 2002:102; Zimmerman 2000: 82).

The self-efficacy theory is briefly outlined in section 3.2.

3.2 THE THEORETICAL BACKGROUND TO SELF-EFFICACY

The aim with the theoretical framework offered here in this chapter is to provide an account of the conceptions and claims concerning the self-efficacy construct. The theory was presented in the following order: Section 3.2.1: the origin of the self-efficacy construct; section 3.2.2: a definition of self-efficacy; section 3.2.3: an exploration of its contributions to academic performance; section 3.3: a discussion of the cultivation and development of self-efficacy through acquisition and use of learning strategies and other related aspects; section 3.4: other sources of self-efficacy; section, 3.5: a discussion of its relationship to other self-constructs and 3.6: the effects of classroom practices and other strategy-related influences.

3.2.1 The origin of the self-efficacy constructs

The self-efficacy theory is one of the key components of Albert Bandura's broader social-cognitive theoretical framework (Pastorelli *et al.* 2001:87; Pintrich & Schunk 2002:143).

The main assumptions of the social-cognitive theory were discussed in chapters 1 and 2 where the model of triadic reciprocity was also explained (Figure 1.1). The triadic reciprocity framework summarises the social-cognitive argument suggesting that behaviour is the result of a complex interrelationship among personal, the environmental and the behavioural factors (Martin 2004:138; Pastorelli *et al.* 2001:87).

Within the learning context, reciprocal determinism simply means that people's learning behaviour is neither driven solely by mental processes and other factors residing within

the learner, nor is it totally controlled by external forces to the extent of passively absorbing and responding to external stimuli without some form of recourse (Jinks & Lorschbach 2003:113, Schunk 2003:160; Schunk & Pajares 2003:16).

Instead, learners are regarded as organisms that actively and pro-actively seek stimulus from the environment and transform it into knowledge using his or her cognitions (Jinks & Lorschbach 2003:113 - 114; Chemers, Hu & Garcia 2001: 56; Guillon, Dosnon, Esteve & Gosling 2004:320-321).

According to Pastorelli *et al.* (2001:87) and Woolfolk (2010:371), the cognitive factors that tend to influence the changes necessary for behaviour that determine one's achievement levels include their personal expectations and perceptions, such as self-efficacy.

3.2.2 A definition of self-efficacy expectations

In his social cognitive learning theory Bandura (1977a:193) distinguishes between outcome expectations and efficacy expectations.

3.2.2.1 Outcome expectations

According to Bandura (1977a:193), outcome expectations refer to one's prediction of likely consequences of certain behaviour, not the behaviour itself. For example, a learner who believes that by using learning strategies he or she will perform well in the test and be praised by teachers and parents has positive outcome expectations and he or she will feel motivated. Learners are generally more motivated if they believe that the outcomes of their action are positive than when they expect negative outcomes. They become motivated by positive value or significance placed on the outcomes expected (Mayer 2008:139 &140).

3.2.2.2 *Efficacy-expectations*

Self-efficacy expectations are based on the individual's belief that he or she possesses certain prerequisite capabilities such as learning strategies, techniques or skills that will enable him or her to execute and accomplish specific courses of action that are required to bring about certain desired levels of performance that exert influence over event that affect his or her life (Bandura 1994:71).

It can be argued that there is some common ground between self-efficacy beliefs and agency. The description of self-efficacy as a causal agent in academic achievement is implied in its definition as: the capability to execute and accomplish specific courses of action required for bringing about certain desired level of performance. It sounds very similar to the definition of agency as the capability to make intentional choices and acting upon those choices. In the same way, a person bringing about performance that exercises influence over events that affect one's life is not different from another person acting on the choices the make a difference in his or her life.

Learners' academic self-efficacy refers to their belief in how well they can perform learning tasks to confident levels of achievement (Bong 2002:133; Decker 2000:96; Pajares & Graham 1999:124; Salili, Chi-Yuen & Lai 2001: 226; Walker 2003:174; Zimmerman 2000:82). Learners will therefore, feel more confident in attempting tasks and activities for which they believe they have the capacity to understand and expect to achieve (Linnenbrink & Pintrich 2003:120; Pintrich & Schunk 2003:159; Schunk & Pajares 2003:15; Zimmerman 2000: 83). In contrast, learners with low self-efficacy beliefs about themselves tend to lack the confidence and courage to attempt task that they feel not capable of.

Researchers insist on distinguishing self-efficacy from other self-personal beliefs (Bong & Clark 1999:140; Pastorelli *et al.* 2001:88; Valentine 2004:275).

3.2.3 Self-efficacy in relation with other personal and motivational constructs

A compelling reason for providing a clear definition for the self-efficacy construct is the confusing similarity in the operational meanings it shares with an array of other motivational self-beliefs that have been identified and documented such as self-worth, self-esteem, self-concept, causal attributions and outcome expectancy (Bong & Clark 1999:140; Pastorelli, *et al.* 2001:88; Valentine 2004:275). Of all the self-schemas mentioned here, self-concept has apparently been the most extensively researched (Crowe 2004:55).

Bong and Clark (1999:141) caution researchers to be wary of any conceptual or methodological issues of different constructs that may confound the outcomes of the study of self-efficacy and its implication on educational practice. Among the similarities that these self- percepts share is the impact they are all believed to have on an individual's performance due to their common property of being a causal agent to behaviour and achievement, such that changes in any of them will lead to changes in an individual's subsequent behaviour and performance levels (Bong 1999:140; Valentine *et al.* 2004:112).

Such a similarity may lead not only to a confusion of the concepts, but also hinder how each one of them is observed and measured. Ultimately, it will be difficult to verify the results of research and to apply them in the classroom (Bong & Clark 1999:140; Pastorelli *et al.* 2001:88). In the ensuing paragraphs, the definition of the other self and motivational constructs will be provided so as to show how they differ from the self-efficacy construct.

i) Self-esteem

According to Valentine *et al.* (2004:113), self-esteem refers to a person's global and more affective evaluation of his or her self-worth, or his/ her positive or negative opinion and feeling regarding his/her accomplishments and who he/ she is (Pastorelli *et al.* 2001:88; Schunk, Pintrich & Meece 2008:221 & 379). It is not only one's judgment of one's

capability, which efficacy perceptions are about. As such, it comprises evaluations of the descriptive parts of the self- concept (Pintrich & Schunk 2002: 408).

ii) *The self-concept*

An individual's self-concept refers to his/her more global understanding of whom and what he or she is, based on life experiences (Schunk *et al.* 2008:379). It contains certain assumptions based on self-evaluations and appraisal, which enable people to make predictions about themselves (Schunk and Pajares 2003:16).

Closely related to self-efficacy and other self beliefs are attributions and perceived control.

iii) *Causal attributions*

Causal attributions refer to an individual's understanding of causal relationships between events, and recognising one's role (versus the environment) in determining the outcomes. In school situations, this comprises beliefs held by a learner about the causes of his/her learning and performance failures and successes, that is, whether the causes for his/her success or failure resides within or outside his or her being (Chan & Moore 2006:162).

iv) *Perceived control*

An individual's sense of control (e.g. due to effort) over factors that influence his/her performance such as abilities (Chan & Moore 2006: 162; Schunk & Pajares 2003:17).

In addition to the definition presented in 3.2.2.2, self-efficacy judgments can be described as an integral part of a person's self-esteem, which in turn is part of the global self-concept (Efklides *et al.* 2001:305; Schunk & Pajares 2003:16-17; Zimmerman 2000:84). It involves causal attribution in terms of how they perceive themselves as having control over their fate. It is also related to outcome expectations (Valentine *et al.* 2004:275).

To clearly conceptualize and operationalise the definition of self-efficacy beliefs, some key properties have been identified as indicators of this abstract variable, and also help to distinguish the self-efficacy phenomenon from the other self-beliefs mentioned above, especially the self- concept (Linnenbrink & Pintrich 2003:121; Schunk & Pajares 2003:16-17).

First, whereas self-esteem and self-worth refer to an individual's emotional reaction to actual accomplishment, regarding the definition of self-efficacy (cf. 3.2.2.2) Bandura (1986:391; 1994:71) posits that self-efficacy is judgment of perceived cognitive ability "to organise and execute necessary action". Thus, it assesses specific actions in the light of targeted outcomes or "designated levels of performance". Researchers concur that, in this way, self-efficacy is associated with future functioning and is related to goal setting and goal-attainment since learners only assess themselves before the actions they consider themselves capable of performing (Guillon *et al.* 2004:321; Pintrich & Schunk 2002: 162; Walker 2003:174).

In the second place, the self-concept (and to some extent self-esteem), though also competence- related, it is a more global view of the self. It is a complex combination of cognitive and affective aspects relating to an individual's evaluation of the environment. Its cognitive aspects include the description and evaluation of the self. The affective aspects include feelings that ensue after the self-evaluation exercise. It does not necessarily add to the prediction of particular learning outcomes (Pintrich & Schunk 2002:161; Valentine *et al.* 2004:114; Woolfolk 2010:371).

To exemplify the distinction between the two concepts, several researchers (Bong 2002:135; Pintrich & Schunk 2002:162; Schunk 2003:20) point out that a learner who has a positive self-concept can view him/herself as being generally "good" academically. Another learner can feel more self-efficacious in one domain (maths) and not in another (English); or they may feel capable about a specific aspect of the domain (fractions) and not others (multiplication).

The general consensus among theorists and researchers is that, by treating human capability as differentiated and multifaceted, the self-efficacy theory allows for more accurate measurement and judgment of the capabilities in question (Bong 2002:134; Pastorelli *et al.* 2001:88; Valentine 2004:114).

According to Bong and Clark (1999:141-143) as well as Walker (2003:174), learners do not necessarily gauge their efficacy by comparing themselves with their peers. The authors also assert that the learners' efficacy assessment does not necessarily encompass affective reactions.

In contrast, Bong and Clark (1999:141) insist that self-concept has a deeper cognitive aspect to it, which is involved during its formation when an individual's attributes and abilities are compared with some standards or norms. Such comparison and competence-judgment is invariably followed by affective reaction towards the self.

Zimmerman (2000:88) contends that, unlike the relatively more stable self-concept, a person's self-efficacy tends to fluctuate and be less stable because of the effects of other personal as well as environmental conditions surrounding the area of designated performance.

Bong (2002:135) points out that the predictive power of self-efficacy is more visible when it is measured in close temporal proximity to the desired action. In other words there must be a minimal time lapse between its measurement and the targeted action.

It should be noted that the properties that differentiate self-efficacy from the other self-constructs that have been mentioned are, in no way, exhaustive.

3.3 THE CONTRIBUTION OF SELF-EFFICACY TO ACADEMIC PERFORMANCE

The roles of self-efficacy as motivator, predictor, mediator and self-regulator of behaviour have received support from a growing body of research in various domains of human behaviour and achievement. In learning situations academic self-efficacy is hypothesised to have both a direct and indirect effect on learning achievement situations

as it sometimes operates in concert with other variables that influence behaviour and achievement (Alderman 1999:124; Decker 2000:96; Taylor 2002:86-87). Self-efficacy sustains motivation in learners and give them the energy to engage in actions that lead to enhanced achievement levels (Smith 2000:15; Zimmerman 2000:83; Schunk & Pajares 2003:163).

3.3.1 Academic self-efficacy as a predicator of behaviour and a motivator for learning

The emerging consensus among social-cognitive theorists is that an individual's self-efficacy perceptions are predictors of success as well as motivators that instigate, energize, direct and sustain human affect, behaviour and cognition (Walker 2003:174).

As such, self-efficacy perception is also believed to influence the key behavioural indices of academic motivation and success, namely: quality of choices learners make, their level of sustaining the effort they expend on tasks, as well as the tenacity and increased persistence they display in the face of difficulties (Chemers, Hu & Garcia 2001:55; Woolfolk 2010:371).

Learners who have positive self-efficacy beliefs are said to make good choices, expend greater effort, persist longer even when encountering difficulties and achieve a higher level compared to learners with low self-efficacy perceptions, who are characterised by self-doubt, anxiety, lack of effort, behaviour avoidance, failure and learned helplessness (Linnenbrink & Pintrich 2003:127; Schunk *et al.* 2008:139).

3.3.2 Academic self-efficacy as a mediator of other factors that affect performance

A learner's self-efficacy perceptions are hypothesised to mediate and regulate the effects of other determinants of achievement outcomes such as the use of learning strategies and motivational aspects like outcome expectations, goals, and thought patterns on subsequent achievement-oriented activities.

For example, motivational factors such as intrinsic interest in tasks are known to improve learning performance while self-efficacy has been shown to influence learning indirectly through the learner's intrinsic interest (Eccles & Wiegfield 2002:25; Pajares *et al.* 1999:50; Linnenbrink & Schunk 2003:124; Schunk *et al.* 2008:142; Smith 2000:15).

As an aspect of the multifaceted motivation construct and one of the two major components of the self-regulation process (the others are goal setting and outcome expectancy) and of the social cognitive theory, self-efficacy is one element of the self systems that play a critical role by providing learners with a sense of agency to meet their goals and interests (Martin 2004:139; Zimmerman 2000:138; Efklides *et al.* 2001:103; Pajares & Graham 1999:125).

According to Walker (2003:174), self-efficacy's situation-specific attribute implies that it is based on learner specific goals. It is, therefore crucial for learners to find the energy to regulate all executive functions that are essential for the selection, implementation and monitoring of necessary strategies that will lead to the attainment of set goals (Chan & Moore 2006:163).

Studies show that highly efficacious learners are more likely to report using various cognitive and self-regulatory strategies (Chemers *et al.* 2001:56; Pintrich & Schunk 2000:164; Schunk & Pajares 2003:25). Therefore, learners with a high self-efficacy judgment will set challenging goals for themselves and regulate their energies to structure their environment to make it adequately conducive to learning. They will also plan and organise all relevant activities that will ensure the accomplishment of goals and overcome various impediments (Martin 2004:139; Pastorelli *et al.* 2001:88; Linnenbrink & Pintrich 2003:127; Schunk 2003:161; Zimmerman 2000:83). On the other hand, learners who are less efficacious will find it very difficult to regulate their learning activities and are less inclined to seek help. Such learners do not make an effort to use cognitive and metacognitive strategies to enhance their understanding (Scholz, Dona, Sud & Schwarzer 2002:242; Walker 2003:174).

Several studies mentioned by Zimmerman (2000:86) revealed a correlation between learners' self-efficacy and intrinsic interest in skill learning tasks, as well as in the achievement of writing revision and mathematics tasks.

3.4 SOURCES OF SELF-EFFICACY

The self-efficacy theory posits that learners derive their efficacy- information from the following major sources, namely: reciprocal interaction learning, past performances by themselves and others, persuasions by credible others and physical indexes (Pintrich & Schunk 2000:172; Schunk 2003:161; Zimmerman 2000:88).

3.4.1 Reciprocal interaction learning and initial efficacy judgment

Schunk and Pajares (2003:18) assert that from early childhood learners engage in reciprocal interaction learning and exploratory activities with their families, peers and environment at home and in school through which they experience mastery that forms their initial sense of efficacy for learning. In turn, these initial experiences motivate the learner and promote future learning and foster clearer and advanced perceptions of self-efficacy (Pintrich & Schunk 2000:170; Schunk & Pajares 2003:22).

3.4.2 Past performance or enactive experiences

Learning is enactive if the learner learns from the consequences of his or her own actions. They tend to retain and be motivated by actions that led to the led to success while they discard actions that lead to failure. Bandura (1999:288) concedes that performance accomplishments are very influential because they based on own mastery experiences. Success generally raises self-efficacy and failures lower it.

3.4.3 Vicarious experiences

Just as they gain self-efficacy beliefs from their own and direct experiences, people derive their self-efficacy beliefs in much the same way from observing other people's successes and failures and as these people get rewarded, ignored or punished for their

behaviour. It can be argued that people judge their capabilities by comparing their performance with those of others, especially if the models share similar traits with the observer. Thus, the performance of others serves as a standard for self-improvement Bandura (1999:290-291).

3.4.4 Verbal persuasion

Verbal persuasion means trying to talk people into believing that they possess capabilities that will help them to reach their achievement goals. So, learners who are persuaded verbally that they have the capability to master some given task are likely to be motivated to work harder and with sustained effort and with boosted self-efficacy beliefs than those that harbor self-doubt.

Self-efficacy is raised if the person persuaded believes that his/her actions can indeed be possible and effective. Unrealistic persuasions of personal competence only invite failure, discredit the persuader and further undermine the self-efficacy perception of the persuaded. The impact of persuasions on learners' self-efficacy tends to be as strong as the confidence of the persuaded in the persuader. Verbal persuasions are also likely to become believable if they are slightly exceeding what individuals believe they can do with just a little extra effort (Bandura (1999:291).

3.4.5 Physiological states

Literature review reveals that people's physiological arousals (sweating, vascular reaction, gastrointestinal secretions etc) are indication of how they judge learning environment and their own abilities. Interventions that reduce or eliminate sense of threat and emotional arousal heighten the learners' perceived self-efficacy Bandura (1999:291).

3.5 THE ROLE OF STRATEGY ACQUISITION AND USE IN DEVELOPING AND MAINTAINING LEARNERS' SELF-EFFICACY PERCEPTIONS

So far, self-efficacy has been discussed as an antecedent of learning and achievement. As such it also guides and motivates the acquisition and use of learning strategies. However, the main thrust of this chapter is the examination of the self-efficacy construct and its influence on school achievement as a consequence or condition that is caused by the acquisition and use of learning strategies.

Self-regulation theorists have substantiated Bandura's assertion that people rarely express a vacuous sense of efficacy. Learners' self-efficacy judgment is based on the belief that they possess certain relevant prerequisite knowledge and competence for the successful engagement in, and accomplishment of the tasks they are faced with (Walker: 2003:174).

It is then assumed that academic self-efficacy constitutes learner confidence and a sense of control over their learning situation. Some researchers have conceptualized the perceived control as belief about what it takes to do well, as well as whether the tools an individual possesses are adequately suited for carrying out the task with a measure of success (D' Ailly 2003:84-5).

Previously, Chemers *et al.* (2001:55) had argued that a learner perceives a situation as challenging or threatening in terms of how he/she experiences the link between what the situation demands and the coping resources he/she has. Therefore, the learners' possession and increased use of relevant abilities, cognitive and metacognitive strategies will enhance their self- efficacy perceptions to perform and achieve.

Highly efficacious learners are those who believe that they can meet the demands of learning tasks because they possess a repertoire of the necessary and effective cognitive and/or behavioural strategies and activities that are necessary for competent behaviour in that particular domain (Pintrich & Schunk 2000:164). They also believe they can expend the necessary amount of effort with the essential persistence levels when

applying those strategies to produce the desired results even in the face of barriers (Walker 2003:175).

Schunk and Pajares (2003:26) and Walker (2003:176 & 179) recommend that learners be instructed on strategy use along with the use of other classroom processes, especially strategy-value and goal progress feedback, in order to cultivate and develop their self-efficacy perceptions. Walker (2003:175) and Schunk (2003:166) agree that first successful learning experiences and the attribution of these results to effortful use of learnable strategies produce a learner's initial sense of academic self-efficacy.

3.6 THE EFFECTS OF CLASSROOM PRACTICES AND OTHER STRATEGY- RELATED INFLUENCES ON SELF-EFFICACY PERCEPTIONS

Schunk and Pajares (2003:24) have provided a converted model (Figure 3.1), that gives insight into how an individual learner's efficacy perception develops and is sustained by some classroom variables additional to the use of strategies (Pintrich & Schunk 2002:170).

According to the model shown in Figure 3.1, at the outset of learning activities learners differ in their self-efficacy-perceptions for learning. They bring with them different experiences from early learning successes or failures and personal characteristics such as competence, attitude and personality as well as different levels of social support from the significant others in their early lives.

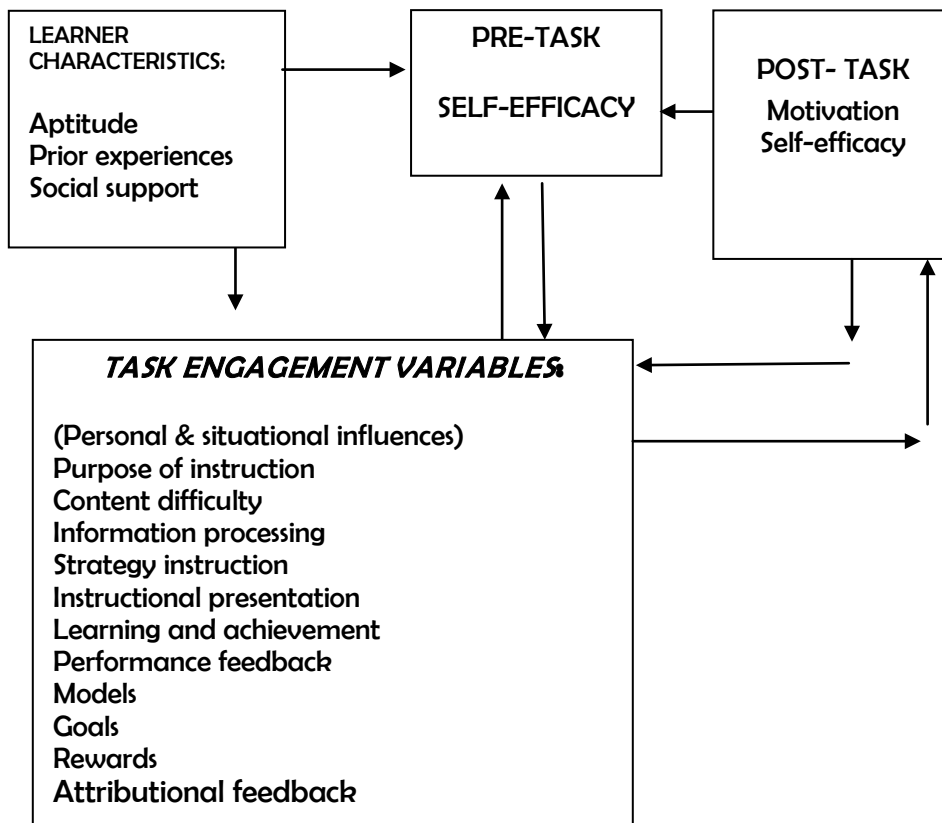


Figure 3.1: The self-efficacy model for learning and achievement (Linnenbrink & Pintrich 2003:122; Schunk & Pajares 2003:34)

In the previous paragraph, it was explained how children in their early childhood interact with their families, peers and environment, especially in home and school environments where they engage in exploratory activities through which they experience mastery. The latter forms their initial sense of efficacy for learning, which engenders the initial motivation, promotes future learning and fosters clearer perceptions of self-efficacy (Pintrich & Schunk 2000:170, Schunk & Pajares 2003:18 & 22).

3.6.1 The effects of task-engagement variables

Theorists assert that the sense of academic self-efficacy acquired by learners in their early stages of learning is developed and validated as and when the learners engage in learning tasks and notice their progress in goal attainment. Good school practices inspire the development of positive efficacy beliefs while negative practices retard such an increase by informing that they are not particularly capable. Other practices may offer ambiguous information regarding their capabilities (Schunk 2003:161; Schunk & Pajares 2000:20).

Examples of task engagement variables that are reflected in the third cluster of the model include: purpose of instruction, instructional presentation, goals, information processing, content difficulty, strategy instruction, models, performance feedback, rewards and attribution feedback (Schunk 2003:160 and Schunk and Pajares 2003:26).

a) The purpose and pattern of instruction

According to Schunk *et al.* (2008:148), learners' motivation and self-efficacy is increased when they know what good use the material they learn can be put to. Those who do not see value in the task, such as task that has brought them failure and shame previously, may experience anxiety if a similar task is being announced.

b) Goals

Setting goals is like stating the purpose of instruction. They both aim at achievement of learning outcomes. Progress made at a particular time can be described in terms of how far or how close it is to attaining the outcomes it is set to achieve. According to Woolfolk (2010:383), goal setting means defining "where learners are and where they want to be".

In order to raise learners' self-efficacy beliefs and motivation, teachers should set goals that are specific, proximal because it is easy to work toward a specific goal than toward an unspecific one; and it is easier to reach a proximal goal than a distal goal one. Other

goals that should be well understood by teachers include ego, mastery goals. Learners feel efficacious as they accomplish their goals (Schunk *et al.* 2008:148).

It should also be the aim of the education system to develop strategic learners.

c) Task difficulty

Like perceived goal difficulty, content or a task that is perceived as difficult, if not attended, tends to engender negative feelings such as dislike for learning area, teacher, school or can lead to hopelessness task avoidance and learned helplessness because the learners believe they cannot perform (Schunk *et al.* 2008:148).

d) Instructional presentation

Classroom practices that affect learners' self-efficacy perceptions have implication for task designs and instructional presentation. Jinks and Lorschach (2003:116) encourage teachers to make decisions that can enhance their learners' self-efficacy beliefs. According to Schunk *et al.* (2008:148), the manner in which the teacher presents the learning material can impact on the learners' self-efficacy beliefs. If they believe they learn well, their efficacy expectation may be enhanced.

To raise their learners' self-efficacy perceptions, teachers should clarify focus. Walker (2003:180) encourages teachers and instructors to tap the learners' intrinsic interest and values by explaining the value or how goal is desirable and accessible. They should set goals that are challenging but manageable, clear, realistic, meaningful and with good motivation why they must be achieved and apply the principle of successive approximation so as to enhance the learners' self-efficacy perception. Instructional practice includes the following aspects:

i) Strategy instruction

One of the goals to be achieved in the classroom has to do with equipping learners with learning strategies to enhance the processing information during learning retrieval and

transfer. It was argued earlier that although much classroom learning involves the comprehension of the learning material and application of acquired knowledge, many learners do not achieve these outcomes because they do not use appropriate strategies.

ii) Modeling

According to Walker (2003:180), strategy instruction, especially by modeling coping strategies, fosters learners' acquisition of strategic knowledge and utilization of the learning strategies to regulate their learning effort and raise their attainment levels. Believing that the strategies lead to learning success may give them a sense of control over their learning outcomes and raise their sense of efficacy (Walker 2003:179).

iii) Feedback and reward

The development of self-efficacy in learning is facilitated by providing learners with general performance feedback, as well as feedback for strategy use, such as "You performed very well in that question because you used appropriate strategies ...". Teachers should observe their learners as they engage in tasks and periodically provide verbal feedback.

Realizing that they are making progress towards goal attainment raises learners' self-efficacy. The judgment learners make about their goal progress is affected by their attributions or perceived causes of outcomes (Schunk *et al.* 2008:375; Woolfolk 2010:247).

Attributions are categorised as external or internal, stable or unstable and controllable or uncontrollable. For example, highly efficacious learners tend to attribute their failure to internal, unstable and controllable causes such as effort, which motivates them to focus on how they can improve their situation. Less efficacious learners attribute failure to stable uncontrollable causes such as lack of ability, which engender apathy, tendency to avoid tasks and helplessness in them (Alderman 1999:22-83; Kruger 2010:101; Schunk *et al.* 2008:106; Woolfolk 2010:389).

iv) *Attributional feedback*

Researchers also insist that teachers should not only motivate their learners by giving attributional feedback but they have to retrain them in order to shift from maladaptive to adaptive attributions (Schunk *et al.* 2008:115-118). The learners' self-efficacy is raised when they are informed that they are making progress towards goal attainment. They also experience increased self-efficacy when they are told that the progress they are making is due to the effort they have expended, especially by applying learning strategies. Teachers should name the strategies in acknowledging their learners' attempts to use strategies.

A brief report of the reading and writing research that was conducted by Schunk and Rice between 1989 and 1993 showed that modeling, goal setting self-evaluation and motivation played a significant role in developing self-efficacy as well as enhancing learning and achievement (Schunk 2003:165-167). Dulonsky and Hertzog (1998:249-265) describe a study that shows an increase in memory efficacy and adaptive attribution of participants after a memory efficacy training that included attributional retraining.

v) *Rewards*

Sometimes feedback involves presentation of rewards for particular learners' good performance. Self-efficacy for learning is said to be dependent on the rewards given to learners for showing progress and for accomplishing their goals. According to Schunk *et al.* (2008:149), promising learners some reward such as free time if they accomplish their goal can instill self-efficacy to perform well, which is validated as they work and realize that they are progressing. However, Mayer (2008:274) asserts that learners appraise all self-efficacy information cognitively before it can be finally adopted. Teachers are also warned about the hidden costs of rewards.

3.6.2 Cognitive processing of self-efficacy information

The self-efficacy theory posits that self-efficacy perceptions emerging from the successes and failures are not an automatic process, but that they are continuously appraised by individuals concerned (Bandura 1999:293). Appraisal is described as an inferential process, in which learners continuously weigh their efficacy perceptions and alter them according to how they perceive performance successes and failures. Some of the factors learners use to adjust their efficacy judgments include the perceived difficulty of the learning task, the circumstances under which they perform, the amount of effort expended, the amount of assistance received and their success or failure pattern (Bandura 1986:401; Bandura 1999:293).

a) Learner enactive performance as an efficacy cue

It is generally acknowledged that successful performances raise the learners' efficacy expectation while failure tends to lower them (Woolfolk 2010:251).

It is also contended that success that is attributed to excessive effort, expenditure and to assistance by other people tends to lower the self-efficacy of the learner involved because it is perceived as an indication that he/she did not cope with the task. On the other hand, successes accomplished with no help from other people and with less effort engender positive self-efficacy.

A good deal of research also indicates that attributing past failures to insufficient effort instead of ability helps learners to persist in working towards their goals, because it suggests to the learner that he/she has the ability, and that all he/she needs is to work harder. Therefore, it raises efficacy levels. Seeing themselves perform without errors can enhance learners' self-efficacy by providing distinctive information on how to perform appropriately, whilst also strengthening self-belief in their capabilities. It is also argued that once a sense of self-efficacy is well developed, an occasional failure should not have much effect on it (Bandura 1999:294; Schunk 2003:16; Zimmerman 2000:88).

b) Observational experiences as an efficacy cue

In the earlier discussion of cognitive models as the best form of vicarious learning, emphasis was placed on the importance coping, credible and similar models. It is mostly teachers who model new skills/strategies for tasks (Bandura 1999:295; Schunk 2003:162-163). It is assumed that the successful efforts of those being observed may convince learners that they too can be successful. It is important, though that the model be perceived as credible source of information.

Conversely, the unsuccessful attempts of the model or a model that is perceived as competent and not being similar to the learner may lower the learner's sense of self-efficacy. A raised sense of self-efficacy in this situation can be negated by subsequent unsuccessful attempts (Schunk 2003:161; Zimmerman 2000:88).

c) Persuasions as efficacy cues

In section 3.4.4 above, it was further suggested that learners often receive efficacy messages through the exhortations of significant people (parents and teachers, friends and peers) in their lives. Positive feedback suggesting that a learner possesses or lacks certain capacity to perform given tasks tends to enhance or lower their efficacy perceptions respectively.

Self-efficacy will, most probably, increase if the persuader is someone viewed by those being persuaded as trustworthy and credible. Positive and successful persuasions may be invalidated by the learner's subsequent unimpressive performance (Bandura 1999:295; Schunk 2003:161; Walker 2003:175). Schunk and colleagues (2008:7 & 156) contend that as part of feedback, rewards that are not tied to a learner's real accomplishment conveys to him/her that he/she need not bother to reach one's goal. These theorists also contend that the behaviour is strengthened when it happens immediately after accomplishment and that the size of the reward counts; decrease in reward size causes decline in strength of behaviour.

d) Emotional indicators of efficacy judgment

Literature linking self-efficacy with emotion suggests that emotional reaction such as sweating, trembling and anxiety before a task may result in a lowered sense of efficacy and a reflection of the extent to which the learner lacks in the capability or strategies required for carrying out the task at hand. An efficacious learner is assumed to be more confident, less apprehensive and has no anxiety or other emotional states about their task-abilities (Schunk 2003:161; Walker 2003:176; Zimmerman 2000:88).

With regard to the presentation method and purpose of instruction, Pintrich and Schunk (2000:170, 173) maintain that self-efficacy increases when instruction is presented in an interesting way. Interesting instruction includes informing learners about the purpose or utility-value of the material to be learned, as well as information about the strategies they can use in order to increase their outcome expectations and motivation (Schunk 2003:161; Schunk & Pajares 2003:16). If material is considered to be uninteresting, or as having little or no utility in their lives, or the recommended strategy is perceived as deficient for the task on hand, negative expectations, which in turn engender negative efficacy perceptions, may be aroused in the learner.

Another assumption is that successful performance raises efficacy in proportion to the difficulty of the task: material or goals that are perceived to be difficult and unattainable may lower their self-efficacy for learning. For learner self-efficacy to be enhanced, they should experience progress in their learning goals. Learners must therefore be assisted to set short term and specific goals, and to be convinced that they are capable of processing the information required for the task (Schunk 2003:163). Researchers unanimously agree that goal-attainment and the accompanying self-efficacy perceptions are contingent on the individual's ability to process information (Kitsantas 2002:102).

The above section has touched on the argument raised in chapter 2 concerning the need to provide strategy training and encourage strategy use by learners. Knowledge and use of cognitive and metacognitive strategies is associated with the facilitation of

information processing, which in turn enhances the learner's confidence levels for achieving their learning outcomes (Schunk & Pajares 2003:21; Walker 2003:176-179).

Many studies suggest that modeling is an important part of instruction, especially when demonstrating the use of a particular strategy. While in many cases learners emulate their teachers' explanations, verbalization and demonstrations, Schunk (2003:163) maintains that learner self-efficacy perceptions and motivation are highly influenced by observing models who share similar attributes with them such as age, gender, ethnic group, than watching dissimilar models. Perceived dissimilarity in models rarely evokes a vicarious sense of efficacy in learners even if they (the models) produce a perfect performance. Similarly, models that are perceived as "experts" do not raise their observers' self-efficacy beliefs, unless they alter those learners' perception of task difficulty by pretending to be unable to cope and then reveal coping strategies (Pintrich & Schunk 2000:174; Schunk 2003:160).

Academic self-efficacy is also hypothesised to increase or decrease; depending on the performance feedback learners receive from significant others in their lives, particularly the teacher. Compared with negative assertions, positive strategy and goal progress feedback has an incremental effect on the learners' sense of efficacy, especially if the learners themselves cannot determine how much progress they are making (Kitsantas 2002:102; Schunk 2003:25,26). It is, however, contended that positive feedback for successes attained through the assistance of others (e.g. the teacher) or from a source that is perceived as being not credible, may not be incremental on the self-efficacy of learners. Instead, such a view may engender in them a feeling that they lack capability. Similarly, it has been confirmed that while self-efficacy is increased by promising learners reward for work done well, rewards that are not tied to their real accomplishment may convey to learners that they need not bother about reaching the goals they set and will lower their sense of efficacy.

Finally, it has been suggested that learners be provided with the right attribution feedback that will enhance their self-efficacy perceptions and contribute to adaptive learning behaviours, such as the forming of positive expectations about future

accomplishments (“You did well because you have the ability for this kind of task”). Again, the feedback must be credible. A learner who is told that he/she is good when, in fact, he/she is struggling may not feel efficacious for similar future tasks. A learner whose failure is attributed to stable and /or uncontrollable factors such as lack of ability may develop a debilitating sense of learned helplessness. More importantly, learners must also be trained to make motivating attributions for their successes or failures in order to increase their self-efficacy beliefs. The training often focuses on changing children’s causal ascription to failure through low ability, to insufficient effort (Pintrich & Schunk 2000:173).

From the discussion of task engagement variables in earlier sections it may have also been noted that the influence of information coming from these sources is not automatic but that it depends on how it is being cognitively appraised. Self- efficacy appraisal is an inferential process through which individuals weigh personal and situational contributions as well as ability and non-ability factors to performance success or failure (Schunk 2003:162).

Kruger and Adams (2010:149) encourage teachers to reclaim their role as facilitators and, among other things, establish classroom where making sense of information taught is valued. Teachers are also urged to design programs that will inculcate and sustain an optimal and positive sense of self-efficacy in their learners by equipping them with learning strategies and using other strategy related classroom activities, in order to help learners to assume responsibility for their own learning (Schunk 2003: 169).

3.7 CONCLUDING REMARKS

Literature reviewed in this chapter suggests that academic self-efficacy predicts learning success as well as mediates other influences of human behaviour such as goal setting and use of learning strategies by learners.

The main emphasis of this chapter has been on the incorporation of learning strategies and related classroom practices in the instruction models that aim at cultivating and enhancing learners' self-efficacy perceptions for effective learning and achievement.

At first self-efficacy was described as being influential the use of learning strategies by learners and to the subsequent academic achievement. However it was later shown that the use of learning strategies and other strategy related practices in the classroom were important in the development of self-efficacy and academic achievement. So far, it seems as if learning strategies, self-efficacy and academic achievement have a reciprocal influence on one another. There is insistence that the learning process is of the integration of strategy (skills) training, enhancement of the will or motivation and the thrill or emotion.

CHAPTER 4

RESEARCH DESIGN

4.1 INTRODUCTION

The purpose of this study was to investigate the influence of learning strategies on learners' self-efficacy and academic achievement. In contextualizing the problem, literature was reviewed and discussed in chapters 2 and 3.

This chapter undertakes to present a detailed description of the research design, paradigm and methodology that was used to investigate the research problem in accordance with the aims and objectives of the study. In addition, the measures to ensure trustworthiness, participant selection, data collection, research instruments as well as procedures for measuring and analyzing data are discussed.

4.2 THE RESEARCH PROBLEM

With a view to the development of the various programmes and activities needed in the improvement of learning strategies to enhance the self-efficacy and academic achievement of primary school learners, the research problem was formulated as follows:

What influence do learning strategies have on the self-efficacy and the academic achievement of township primary school learners, and how can these strategies be enhanced?

The principal aim of this study is to gain a deeper insight into the learning strategies self-efficacy – achievement relationship so that appropriate programmes and activities can be put in place for the enhancement of all the variables and to raise the learners' level of performance and improve the quality of learning using a literature review and an empirical investigation.

4.3 THE AIM OF THE RESEARCH

In section 1.5 it was indicated that the present research seeks to use quantitative, qualitative and statistical measures with the following primary aims in mind:

- i) To define, outline and explain learning strategies, self-efficacy and achievement.
- ii) To establish the extent of the teachers' and the learners' knowledge and use of learning strategies.
- iii) To assess the influence of learning strategies (cognitive and metacognitive learning strategies as well as the motivational) on learner self-efficacy and academic achievement in a scientific way.
- iv) To develop and evaluate programmes, activities and methods of implementation that will enable the researcher to examine the relationship between the learners' knowledge and use of learning strategies and their self-efficacy perception and their academic performance.
- v) To design, develop and evaluate programmes and activities as well as the methods that will determine the effectiveness of strategy-instruction and self-efficacy cultivation in promoting the knowledge and use of reading comprehension strategies and positive self-efficacy perceptions of the experimental group after the training the programme.
- vi) To establish the reliability of the programmes involved.
- vii) To investigate and outline will role that the school community, particularly teachers, could play with regard development of their learner's strategic behaviour.

Moreover, this study aims at encouraging debates among educators as well as bigger research projects involving more schools within the district - to replicate the study and to test whether the outcomes of the study can be applied in other areas, especially in other township primary school classrooms in future.

The variables being tested involve the use of self-regulation strategies of township primary school learners, especially the cognitive learning strategies that can improve the

learners' reading comprehension such as text predicting, prior knowledge activation, summarising the main ideas, and hierarchical representation of the text.

The metacognitive strategies that will be considered for examination in this study are: goal setting, planning comprehension monitoring through self-questioning and re-reading. The strategy-value and progress feedback have been examined as some of the sources of self-efficacy.

In summary, the relationship among the variables to be studied can be presented as indicated in Table 4.1:

Cause (X)**Outcomes (Y)**

<p>Learning strategies:</p> <p>a) <u>Cognitive strategies</u>: text predicting, prior knowledge activation, summarising the main ideas and hierarchical representation of text.</p> <p>b) <u>Metacognitive strategies</u>: Comprehension monitoring through self-questioning and re-reading</p> <p><u>Motivational strategies</u>: Strategy-value feedback, progress feedback and strategy knowledge and other classroom practices.</p>	<p>(i) Learner self-efficacy</p> <p>(ii) Academic achievement (in the form of the scores/ marks of the comprehension and recall tasks.</p>
<p>c) <u>Motivational self-efficacy perceptions</u>: feedback, goals</p>	<p>(i) Academic achievement</p>
<p>d) Strategy instruction and efficacy cultivation.</p>	<p>(i) Improved strategy knowledge, strategy use and,</p> <p>(ii) enhanced positive self-efficacy perception</p> <p>(iii) Academic achievement</p>

Table 4.1: A list of dependent and independent variables**4.3.1 Research questions**

In section 1.7 it was stated that this study aimed at providing answers to the following questions:

What are the effects of learning strategies on self-efficacy and academic achievement, and how can these be enhanced?

Furthermore, secondary questions that arose are as follows:

- a) Is the acquisition and deliberate use of learning strategies necessary and possible for learners at primary school level?
- b) Does instruction in learning strategy-use and self-efficacy improve learners' tendency to embrace learning strategies while also cultivating their positive efficacy- perceptions? Do learning strategies affect learners' self-efficacy beliefs?
- c) What activities and programmes are needed, and what can teachers do to promote the development of these programmes and to increase learning strategy knowledge and use in the primary school so as to enhance their learners' self-efficacy and academic achievement?
- d) Why do some children not use the strategies they have learned? What will aid the generalisation of the newly acquired strategies?
- e) Do learning strategies and self-efficacy together or individually influence the learners' academic achievement or do all three variables namely; leaning strategies, self-efficacy and academic achievement influence one another?
- f) What can be recommended for future research about learning strategies?

4.3.2 Hypotheses

The present study also aimed at testing the following hypotheses that were formulated and presented in section 1.8:

Ho1: There is no relationship between the learning strategies and self-efficacy of Black township primary school learners.

Ha1: There is a relationship between the learning strategies and self-efficacy of Black township primary school learners.

Ho2: There is no relationship between self-efficacy and the academic achievement of Black township primary school learners.

Ha2: There is a relationship between self-efficacy and academic achievement of Black township primary school learners.

Ho3: There is no relationship between the learning strategies and the academic achievement of learners in Black township primary schools.

Ha3: There is a relationship between the learning strategies and the academic achievement of learners in Black township primary schools.

Ho4: There is no relationship among learning strategies, self-efficacy and academic achievement.

Ha4: There is a mutual relationship among learning strategies, self-efficacy and academic achievement.

Ho5: Strategy-training does not improve learners' knowledge and use of learning strategies.

Ha5: Strategy-training improves learners' knowledge and use of learning strategies.

4.4 PLANNING FOR THE EMPIRICAL INVESTIGATION

Following the cyclic model of action research, the planning activities that started when the study was conceived, albeit at an individual level, gathered some momentum. The first quarter of 2007 saw advanced planning for the study, involving dialogue and communication with various parties.

The researcher held meetings with colleagues in the intermediate-senior phase of the selected school in order to review the then current achievement records and discuss the rationale for conducting the research, especially the need to provide strategy instruction

and efficacy development to learners who are under performing. Part of the meeting's agenda was to solicit the teachers' collaboration. At the end of the first meeting, a research team consisting of five members was formed and the researcher became both a facilitator and a participator in the team.

The criteria for selecting participants were discussed at length (see sampling in 4.5.2) and invitations were sent out (Appendix C). Application for approval to conduct the research in the school was made to the GDE in accordance with the briefing document on Requests for Research (Appendix A) and parental consent for learners to participate in the study (Appendix B) was sought and obtained.

The selected participants were prepared through a briefing on the intentions of the study and the programme of events. A further number of meetings with research team were held to explain the theoretical framework, co-create a plan of action and iron out other aspects and issues relating to the study. The team members were also guided, through a series of workshops on administering the questionnaires, as well as in conducting the instruction sessions and recording procedures.

For the learners' instructional programs, training sessions were held in which statements were developed about the critical and learning outcomes that should be attained. Models of scripted lessons were selected discussed in details and role-played for each instruction phase (Appendix D). The programme for a complete phase is detailed below in section 4.6.

4.5 THE RESEARCH DESIGN

Collins *et al.* (2000:122) suggest that as plan of action that guides all other activities, the research design should be drawn before the actual collection of data. The research design includes the methods that will be used in the study.

4.5.1 The research method

It was indicated in section 1.7 that the aim of this study is to use both the quantitative (quasi-experimental method) and the qualitative (action research) approaches to explore the influence of learning strategies on the learners' self-efficacy and academic achievement.

Researchers concede that the quantitative approach and the qualitative approach can be distinguished but cannot always be separated. It is assumed that mixed or multiple methods help counteract the limitation of a single method, particularly in studies involving complex human behaviour (Collins, *et al.* 2000:87, 91; Wickam, Bailey & Cooper 2000:14-16; Ivankova *et al.* 2010:263). A mixed method approach is therefore deemed suitable in this study because of the learners' language limitations.

a) The nature of quantitative research

According to Collins, *et al.* (2000:87) and Wickham and Bailey (2000:16), the quantitative approach relies on the manipulation of numbers and quantifying measurements when testing relationships between variables. The two authors also point out that the quantitative research methods also stress the importance of objectivity when undertaking research. Ivankona *et al.* (2010:261) mention the experimental research and surveys as typical types of quantitative research

The true experimental methods has adopted the positivist philosophy of knowing that emphasises objectivity as well as manipulating and analyzing and interpreting numbers, structure and strict control of phenomena using the experimental and the control groups. It is involved with effecting a change in the value of one variable- called the independent variable – and observing its impact of that change on another variable – called the dependent (Collins *et al.* 2000:132; Haslam & McGarty 1998:46).

As we are studying the relationship between learning strategies, self-efficacy and academic achievement, the quasi- experimental research has been selected for use in this study because of its approximation of the condition of a true experimental design in test-

situations, especially that it does not permit the strict control on variables (especially in human) in the explanation of cause- and -effect relationship between the independent variable and the dependent variable (Haslam & McGarty 1998:47; Collins *et al.* 2000:132).

Another difference between the true experimental method and the quasi experimental methods is that, unlike in the former method, the participant groups in the latter method are constituted by other means than random sampling, therefore they remain intact (Ivankona *et al.* 2010:257, 261; Haslam & McGarty 1998:46).

As in a true experimental research, the quasi experimental approach in this study involves choosing the subjects, data collection techniques method (questionnaires and interviews) and data collection procedures as well as implementation of intervention procedures. The experimental group and the control group took part in the pre-test and the post-test sessions, but only the experimental group was exposed to the experimental treatment that involves strategy and self-efficacy. Once data has been collected, the numbers are presented graphically and statistically, and then analysed and interpreted to answer the research question in a way of affirming or nullifying the existing theories on the existence or relatedness of phenomena (Wampold 2006:97)

b) The nature of qualitative research

Qualitative research is defined as an inquiry process where a researcher, in a natural setting, develops a complex, holistic and historical analysis of the informants' language during interviews and observation, in order to understand the reality of their experiences (Cresswell 1998:14-15). A qualitative approach is said to involve an in-depth inquiry than quantitative research because it offers "a rich description of individual attitudes, perceptions, beliefs, views and feelings" (Ivankona 2010:259; Henning, Van Rensburg & Smith 2004:3)

As a form of qualitative research, action research in this study will provide word-of-mouth episodes to analyse unravel complex situations and create a holistic picture of the

natural setting, which is the classroom (Cresswell 1998:14-15; Collins *et al.* 2000:87; Wickham and Bailey 2000:16).

Action research is described as research that is conducted by insiders such as teachers in a school situation, to enable them to formulate and act upon their own concerns with the aim of developing specific conditions in their situation, such as improving their own practice (Ivankona *et al.* 2010:261; Parker 2005:120-129).

Therefore, action research is well suited for this study that is aimed at improving the quality of teaching and learning in the school that has been selected for the investigation of learning strategy and their influence on the learners' self-efficacy and academic achievement. It was used to complement the quasi experimental method during the processes of data collection, analysis and the interpretation of the results in this study.

This chapter focuses on solving the problem by means of qualitative action research using the and four moments cyclical models of Zuber-Skerrit (1993:11-13; cf. Holy, Arhar & Kasten 2005:43, 44 and 132) that was introduced in 1.7.1 to demonstrate the different levels of the investigation, namely, reflection, planning, action and observation moments. Zuber-Skerrit (1992:11) describes the four major moments in terms of the activities that he associates them with.

The *reflection* moment is described as the phase where researchers contemplate the challenges requiring action, identify relevant resources, set and negotiate expectation and agenda with stakeholders. In the *planning phase* action plans are devised or reviewed and access to resources is prioritised. Based on the action plan, *action* phase is to be collaboratively implemented by participants. During this phase, the data are collected, intervention sessions conducted and the participants given time to practise in applying the newly acquired learning strategies. The actions are continuously *observed* by the learners as the teachers' model the learning strategies to them. In the same way, teachers observe the learners as they observe the modeling and as they practise to apply the strategies so that they can detect any changes in the subjects' application of learning strategies and in their feeling about the progress they are making.

At the end of a cycle, learners reflect about what they have learned and assess their understanding. The end of a cycle also marks the beginning of another; researchers reflect about the programme and the learners' progress as the results of the experiment are being recorded, analysed, interpreted, discussed and concluded with consideration for future action that is aimed at gaining a better understanding of the influence of learning strategies on the self-efficacy and academic achievement of learners.

The phases interact and take place simultaneously most times. Although more than one cycle is usually completed in this type of research, only one cycle has been completed in this study due to the constraints of time. The model has thus been tailored to the needs of this study.

4.5.2 Sampling

A sample, according to Nieuwenhuis (2010:79), is a process used to select a portion of the population for study. A sample of one hundred and fifty two (152) mixed ability, boys and girls of ages 10 -13 were selected out of a population of three hundred (300) learners in the Intermediate and Senior (Inter-sen) phase (Grades 4-7) of the selected primary school, Johannesburg Central District, Soweto in the Gauteng Province.

The selected school is a typical example of a public primary school found in any historically Black residential area of South Africa. Despite the non-racial school policies, all the learners in this primary school are Black, and they come from a predominantly low to medium socio-economic environment, where an African language is spoken and English is used as a second or third language in school.

The learners have varying reading and learning ability levels and although their teachers and the school-based support team (SBST) members are not qualified to diagnose learning disabilities, they have indicated that significant learning and/or reading comprehension challenges and deficiencies were evident in all of the selected learners.

The quota sampling method was used so that each Grade could be equitably represented in the same proportion. As such, there were 30 learners per Grade in the four

experimental groups (total of 120) and thirty-two learners (8 per Grade) formed the control group.

The selection of participants was not by random sampling because the study was quasi experimental. The 38 selected participants from each Grade were learners who had registered poor performance records (i. e. they got below 40% and less in more than three tests in the past six months).

4.5.3 Instruments

The final planning activities involved the preparation of the data collection instruments and the strategy training material. A questionnaire is the most widely used method to obtain information, this study employed the questionnaire as measuring instruments for learning strategies, motivation (specifically self-efficacy perceptions and achievement).

The questionnaires used are those that were used in previous studies by other researchers. Where it was necessary the scales were all adapted for use in predominantly South African township primary school contexts. The instruments used included the Self-Regulated Learning Interview Schedule (SRLIS), motivated strategies for learning questionnaire (MSLQ) and the children self-efficacy scales (CPSE). Comprehension passages from different learning areas' text books were used to test strategy application and performance in content related knowledge.

4.5.3.1 Instruments for Learning Strategies

a) Learning strategy

- i) *Self-Regulated-Learning Interview Schedule (SRLIS)* consists of 20 items, each describing the strategies used by learners that were identified by Zimmerman and Martinez -Pons (1986; 1988). It is used to assess learner awareness and reported use of Self-Regulated-Learning Strategies. Learners' self-regulation was measured on all 16 of the items, namely eight questions and eight follow up questions.

All 152 learners were assessed to determine the types of strategies they typically use and their efficacy judgment simultaneously by answering questions in a semi-structured interview (Appendix E). A tape recorder was used to record the responses.

- ii) *The Motivated Learning and Strategies Questionnaire* (MLSQ) was designed by Pintrich and De Groot in 1990 and is a 56-item self-report inventory. It is used to measure learner self-regulation strategies (13 items of cognitive strategy use and 9 items of metacognitive strategy use and effort management) as well as 9 items of self-efficacy. Other categories of the MLSQ that were not the focuses of this study are three motivational orientations, including part A; part B: 9 intrinsic value items; and part C: 4 test-anxiety items.

Because of time constraints, no pilot study was conducted on the MLSQ and other instruments. To adapt the scales to the present context, a discriminatory index was calculated for each item by correlating each item with the total score on the questionnaire in order to reduce the number of items and to eliminate the items that did not differentiate between high and low strategy use or self-efficacy. As an external criterion was not available, the total score on all items (i.e. the total score) was used as criterion (Nieuwenhuis 2007:222).

All items with a correlation less than 0, 45 were eliminated. Based on item discrimination four items were left out from the original version of the scale (Appendix F1). The items that were left out include: 44, 47, 53 and 56 from the original questionnaire or 10, 13, 19 and 22 in the adapted questionnaire.

Learners responded to cognitive, metacognitive items, the self-efficacy and test-anxiety items on a 5 point Likert scale (ranging from 1= “not at all true of me”, to 5 = “Very true of me”) in terms of the their Natural science (NS) and Social sciences (SS.) learning areas (Appendix F).

- iii) *Reading Comprehension content and Strategies Assessment:* In order to assess the learners' knowledge and use of learning strategies and their levels of efficacy, they answered questions based on their classroom work. For the pre and post reading comprehension assessment, ten expository texts were provided from the learners' Renewed National Curriculum Statement (RNCS) and The National Curriculum Statements (NCS) prescribed books at the level of each Grade of learners. Clacherty, Cohen, Joannides, Ludlow and Dada (2004) provided the texts for Grades 4 and 5 on 'People live in settlements' (pp. 1-16), 'Different religions' (pp.142-149), 'people and health /nutrition' (pp.71-85) and 'Early Civilizations'(pp.127-150).

The Grade 6 and Grade 7 read the following passages by Clacherty, Eesterhuysen and Paxton (2004): 'Looking at rocks' (61- 68) and 'Fossils' (pp72-75) and 'Reproduction and Change: Vertebrates- fish amphibians, reptiles and birds' (pp157-160) and The reproduction of mammals' (P.159), as well as (Thurlow & Tonkin 2010:127-139) All texts were adapted for the purpose of this study.

For the training texts, the topics used by Carriedo and Alonso-Tapia (1996:1147-149) on "Musculature" and "The Industrial Revolution" were chosen and adapted (Appendix D).

The two texts used for pre-test and post- test forms are essentially of the same test that was comprised of different items in order to avoid possible practice effect that may result from using the same tool for the post-test. The passages ranged in length from 12-80 lines followed by 13 texts explicit and 12 text implicit questions of various types (e.g. open-ended, classification, summarization, drawing text structures), to test learner understanding of the text and use of the strategies mentioned above.

Learners were scored two points on each correct answer and the total was converted into a percentage by dividing the score obtained by total score x 100

b) Self-efficacy Measures

- i) *Motivated Learning Questionnaire*: This questionnaire considered supplementary to the CPSES (see ii, below) was used to measure learners' self-efficacy perceptions (Appendix F2).
- ii) *The Children's Perceived Self-Efficacy Scale (CPSES)*: The Children's Perceived Self-Efficacy Scale (CPSES) is a multidimensional tool developed by Bandura in 1989 and administered according to procedures detailed in Pastorelli *et al.* (2001). The 40-item scale was later reduced to 37 items. The scale includes items for academic self-efficacy, for Self-Regulated-Learning, for social-efficacy and enlisting social resources and support.

Learners responded to the 19 academic self-efficacy items on a 7- point Likert-type scale (1= "not well at all" to 7= "Very well". The higher scale values translated into higher perceived self-efficacy levels (Pastorelli *et al.* 2001: 88, 89 97) (Appendix G). In the planning stage, the research team suggested that the original 7 point Likert scale would be too demanding for the learners at their levels that it be reduced to 5 point.

A questionnaire (Appendix F & G) was distributed to all participant that had returned a consent form agreeing to the terms of the study (Appendices B & C). Each subject was given clear instruction on completing the questionnaire.

4.5.4 The rationale for selecting the instruments

Some of the reasons that led to the selection of the above mentioned research tools include their reliability and validity. These are essential concepts in scientific research which "helps to ensure that our measures are objective' (Pellegrini, Symons, & Hoch 2004:140).

a) Reliability

Reliability refers to the uniformity of an experiment. This suggests that the same results can be reproduced by different researchers under similar conditions (Straus & Myburg 2000:64).

The process of solving problems through tests requires that the tests should be highly reliable and valid to prove their consistency and relevance respectively. So far the many studies replicated in this study, used the instruments listed above, reflecting the following reliability coefficients:

- i. According to Law and Chan (2002:193), their studies of the MLSQ carried out in the Western and Asian cultures have shown it to be a reliable and valid instrument in investigations.

In their study examining the relationship between MSLQ and the Learning Process Questionnaire (LPQ), Sachs and colleagues found the consistency (internal reliability) of the MSLQ ranging between $\alpha=.74$ and $\alpha=.87$ across the different categories. Other results suggesting that the MSLQ has relatively good consistency, internal reliability and predictive analysis were reported from the study conducted by Pintrich, Smith, Garcia and McKeachie (1993) and in the tests conducted by Pintrich and De Groot (1990).

- ii. The finding of a cross national and cross domain study that examined the factor structure and the 'replicability' of Bandura's CPSES (1990) yielded the following reliability coefficients (α) for Italy, Hungary and Poland respectively: Academic efficacy $\alpha=.87$, $\alpha=.86$ and $\alpha=.89$ Self-Regulatory-efficacy ($\alpha=.74$, $\alpha=.57$ and $\alpha=.78$) and Social efficacy/Support ($\alpha=.81$, $\alpha=.72$ and $\alpha=.86$) (Pastorelli *et al.* 2001: 90).
- iii. When Grades 5, 8 and 11 were asked to describe their use of 14 self-regulated learning strategies and to estimate their verbal and mathematics efficacy (Zimmerman & Martinez- Pons 1990:52-54), the measure of the interim response using the Kuder-Richardson. Twenty (20) analyses revealed coefficients of .64 for

verbal efficacy and .69 for mathematics efficacy. Two weeks later, the re-test sample of Grades 9 and 12 learners of varying abilities revealed the anticipated higher test-retest coefficients of .73, $p < .02$ (Mathematics efficacy) and .78, $p < .02$ (Verbal efficacy), thus providing acceptable levels of reliability for the scale.

The administration of two parallel versions to provide information about the same phenomena being investigated in the same groups is intended to determine the degree of reliability by correlating the two sets of results they yield.

b) Validity

Instrument validity refers to the relevance of measurement and results on different occasions (McMillan & Schumacher, 2006:130). Validity also implies the reliability and truthfulness of the measure (Pellegrini, Symons & Hoch 2004:140).

The pre-test and the post-tests are the same, so no deviation will take place in the instrument used to assess the learners. All subjects will be tested in similar conditions in order to ensure a fair standard of assessment. The two aspects focused on consist of *content validity* and *face validity*.

Content validity ensures that after a thorough investigation of literature regarding the learning strategies, self-efficacy and academic achievement as well as other related concepts including the sub-sections of mathematics, literacy and life-skills that all the aspects of the sub-sections will receive priority in this study. All tests and programmes used and implemented for the intervention are all based on the theory discussed in the conceptual framework.

Face validity ensures that the concepts that were tested follow a developmental pattern and structure, for example Grade 4 learners cannot be given texts that are prescribed for Grade 7s.

Validity is differentiated as internal or external

c) Internal validity

Internal validity refers to the extent to which outcomes of a cause and effect experiment are accurate. Internal validity may be affected by factors or incidences that can take place outside of the researcher's control such as the following:

- i) History: The accuracy of the experiment depends to a large extent on the participants' regular attendance. Absenteeism during the intervention programme may lead to outcomes that do not give a true reflection of the process than in a case where attendance is regular.

In this study, only subjects present for both the pre-test and the post-test were submitted and analyzed.

- ii) Subject Attrition: The weakening or tiring of participants due to various causes could affect the outcomes. Intervention and testing took place in the morning before the learners became hungry and tired
- iii) Maturation: Maturation refers to changes in the individual subject between the pre-test and the post-test due to growth and development. Since the latter factors cannot be stopped, every precaution was taken to ensure that factors such as time of day, the weather. The learners' health issues were considered as the research is conducted.
- iv) Instrumentation: The instrument used for the pre and the post-tests in this study and the person implementing the research remained constant throughout the research process so that there should not be any deviation in the implementation process. Change of instrumentation in the middle of the programme may impact negatively on the results (Neuman, 2006:262; McMillan & Schumacher 2006:262).

d) External validity

Population external validity is the extent to which the results can be generalized to all other people, not only people with similar characteristics. If the results of study need to be generalized only to a population that have similar characteristics, it should be to people of the same age, race, sex and ability as the subject group (McMillan *et al.* 2006: 141). All the learners (boys and girls) in both experimental and control groups are between the ages of 10 and 14 years and in the same grades of the selected primary school situated in a township. All the learners with mixed abilities come from low to medium socio-economic background where several African languages are spoken.

As with the case of reliability discussed in 4.5.4(a), an attempt was made to also provide a reasonable degree of test-validity, by adopting a multi-trait, multi-method approach in the selection and administration of these tests. For instance, the triangulation or concurrent use of the quantitative (quasi- experimental) design with qualitative design and investigation methods (observation, interview etc) were used as a measure of internal validity.

The judgment or feedback provided by the panel of collaborating teachers testing and instructing the learners in a real life setting would not only guard against possible researcher expectations, but might also yield information with broader applicability to other similar situations such as other schools.

To determine the validity of the measurement instruments, consideration was given to the form of validity required of the selected instruments, namely content, construct and criterion validity rather than just face validity. The instruments have a good number of test items that targeted the patterns of behaviour (even if not seen) that reflect the manifestation the phenomena being tested, namely learning strategies (cognitive, metacognitive and affective) in their relationship with self-efficacy and academic achievement.

The instruments were formulated in a language that is simple, which made them easy to administer and to score. According to Straus and Myburg (2000:64), the use of a range of data collection methods is a means of ensuring reliability and validity.

4.5.5 Ethical measures

The research took the ethical consideration, which can also be described as trustworthiness into account. For the purpose of this research, trustworthiness can be defined in terms of the “true-value” of the findings (Phetla1998:68). The truthfulness, or true-value, of this study was evaluated based on informed consent, confidentiality, reliability, validity and applicability.

Communication with the parents of the learners included a detailed explanation of the aims and objectives of this investigation. All participants and their parents were required to sign consent forms (Appendices B & C) indicating their willingness to participate in the study. They were assured that strict confidentiality would be practised and all information would be coded in order to protect the children’s self-image or any damage that may come out of the research process.

Care was taken to record information as the participants presented it so as to ensure credibility of the outcomes. According to De Vos (1998:332), a qualitative study is credible when it represents such an accurate description and interpretation of human experience that people who share the experience would immediately recognise it.

Applicability, as another form of trustworthiness refers to the degree to which the study can be generalised or applied to other contexts, setting or groups. Because the study is restricted to only one selected primary school and with a particular purpose in mind, the findings and recommendations of this study should be restricted to this school until similar research has been carried out with a wider range of schools.

4.5.6 Data collection procedure

In this section, the endeavour to follow the ‘four moment’s model’ of Zuber-Skerrit is described.

The planning for the study involved communication with all prospective role players such as obtaining permission from the education authorities to conduct research in the school, providing the parents of the learners with the details of the investigation and obtaining their permission for their children’s participation, recruiting team members and having all participants and parents signing consent forms. Planning also meant that meetings should be held with discuss the rationale and the theoretical framework of the study. In these meetings, which became more collaborative and analytical consensus was reached regarding the instruments, logistics and procedure for the study. Once all the preparations were finalised, the research team started implementing the plans by collecting the much needed data, focusing on the assessment of the study.

The action moment began when participants and team the five team members assembled in the hall, where introduction were done, participants allocated class rooms and the order of events was explained. The learners were informed that data collection would be done by means of interviews, followed by paper and pencil pre-tests, strategy instruction, another interview and paper and pencil *post-tests*. Learners’ attention was drawn to the intervention programme that was displayed on the notice board.

In the various classes the concepts of the self-efficacy construct and learning strategies were explained to the learners with simple examples. For example, in order to provide practice with self-efficacy assessment, learners judged their capability to progressively improve behaviour (e.g. jumping higher) and the concomitant confidence. Throughout the programme, requests for honesty were reiterated.

Learners were tested on their use of self-regulated learning strategies and their self-efficacy perceptions as well as their capability to correctly answer different types of text

questions as evidence that they understood the contents and to apply the relevant learning strategies.

The pre- and *post-test* control group design of the quasi-experimental method was used parallel with the action moment of Zuber-Skeritt's cyclic action research model. The scheme for the former method can be summarised as follows:

- For quasi-experimental method:

(i) Experiment

01...X...02

(ii) Control

03.....04

- (Where 01 = Pre-testing, X = Experimental treatments and 02. Post-test, commonly presented as Pre-test-Intervention-post-test). The control group is represented in the second box as 03 (*pre-tests*) followed directly by 04 (*post-test*), without intervention.
- Process also was guided by the cyclic action research model: Planning, action, observe, reflect (par. 1.7.1 & 4.5.1).

4.5.6.1 Interviews

During the first term of 2007 the learners were informed that that both the experimental and the control groups would meet with members of the research team in a one-on-one semi structured interview session. They would be interviewed on how they engaged in learning activities and assessment themselves. Their self-efficacy judgments will also be reflected in the responses.

The Self-Regulated Interview Schedule (SRLIS) (Appendix E) devised by Zimmerman and Martinez- Pons (1989) was used as a guideline to determine the level of the learners' knowledge and use of learning strategies, their self-efficacy perceptions as well as class performance levels.

The learners responded by answering questions in the interview session. Their responses were recorded on an audio tape recorder and later transcribed verbatim before being qualitatively analysed. After a lengthy argument about the outcomes of the qualitative analysis, the team agreed that the responses should also be analysed quantitatively in order to compare the outcomes of the two sets of responses.

4.5.6.2 Pen and paper questionnaires

i) Self-efficacy and learning strategies

All participants including the control group were informed that they would respond to questions about their learning and test-taking practices in writing. They were also instructed on how to fill in questionnaires before the actual self-efficacy questionnaires were administered.

Thereafter, under the supervision of collaborating teachers, participants filled in the Children's Perceptions of Self-Efficacy Scale (CPSES) for their self-efficacy assessment. This was followed of the Motivated Learning Strategies and Study Questionnaire (MLSQ) for the assessment of the learning strategies and self-efficacy components. The experimental and the control groups performed pre-tests for one week.

ii) The text comprehension pre-test

Still assigned to the same groups, the participants answered the accompanying 50 mark strategy application and comprehension question-types drawn from the text book passages. The number of correctly answered questions and the number of strategies used became the measure of success or failure.

4.5.7 The Learning Strategies Instruction and self-efficacy cultivation

For a period of 10 weeks (July to middle of November 2007) learners in the two groups were involved in the daily school programme, to which only the intervention sessions were added for the experimental group, in order to increase their knowledge and use of learning strategies.

a) The aim of the intervention programme

The aim of the intervention programme was to test the incremental effects of using selected self-regulation strategies for reading comprehension on the self-efficacy perceptions of academic performance of the experimental group, while also providing them with motivational support and self-efficacy enhancement through strategy value feedback. Ultimately, participants would probably improve their learning efficiency and autonomy.

b) Training procedure

All sessions followed the same procedures using different passages for different grades. Learners observed the strategy modeling by the instructors who, in turn observed and monitored the process and the progress throughout the treatment period. In particular the instructors observed the learner during practice sessions to make sure that they understand. Observation is the third major moment of the Zuber-Skerrit's model.

The training, practice and testing components of the study consisted of six modules that were run over ten sessions. Each class met two times a week for 45 minutes. One session was delivered during the regular life orientation period of each class and the other one took place before school started (between 07h05 and 07h50). Time included practice, during which participants worked on activities that needed application of the strategies they were instructed in. Time was also allocated separately to include the research teams' planning, mini workshops, and implementation, recording, review and evaluation meetings.

Strategy instruction focused on the use of cognitive-comprehension strategies such as prediction, prior knowledge activation, main idea summarisation, reading structure presentation. Meta-cognitive strategies training (goal-setting and self-monitoring through self-questioning) and affective-motivational and support strategies (strategy value feedback, modeling) formed an integral part of cognitive strategies instruction.

4.5.7.1 The instruction programme

The framework consisting of acquisition, consolidation and consultation phases provided by Meichenbaum and Biemiller (1998) was followed in the instruction programme, which ran as follows:

Session 1: In the first week of the programme learners performed *pre-tests*. The self-regulated learning interviews were conducted first, followed by written tests on the learners' learning strategy use and self-efficacy beliefs. The teacher distributed test materials containing several reading passages extracted from learning area text books and questions to test comprehension, ability to identify main ideas, activate prior knowledge and use text structure representations

Session 2: This introduction and orientation session focused on the review of learners' current performance levels, rationale for training and for the use of learning strategies as a means of facilitating understanding and remembering what they read, as well as on the benefits of active learning. Particular emphasis to learners was on the need to exert effort, especially with regard to strategy application.

Session 3 and 4: A short theoretical explanation of general learning strategies including definition, categories, description, functions and a few examples of learning strategies were modeled and practice provided

Session 5 and 6: Learners were informed that the training goal for the programme was to learn to apply the reading comprehension strategies of prior knowledge activation, finding the main idea(s) in a text, summarising and restructuring a text. The strategies were exemplified through modeling by participating teachers.

Session 7 and 8: The importance of goal setting, the value of strategy application and self-monitoring was discussed and followed with practice Learners were trained on how to generate their own questions/self-questioning before, during or after reading. Content-free questions are displayed on the board and read aloud once more.

Self-monitoring, self-questioning and strategy value feedback were incorporated in the strategy training and did not necessitate either extra or longer sessions.

Sessions 3 to 7 were characterised by acquisition of strategies knowledge through listening and observation of models, followed by consolidation through practice, monitoring, scaffolding and feedback.

Session 9: In the final or consultation stage of the programme participants were given time to reflect on what they did in the last seven session they share their knowledge with their peers and seek help

Session 10: Learners took part in post-tests (see section 4.5.7.1)

4.5.7.2 Instruction presentation

Using the models of Meichenbaum and Biemiller (1998:134) and Winne and Hadwin (283-285) as a guide, the following five-steps of comprehension strategy teaching was printed on a poster board:

What do I have to do?

- (1) Guess what the text is about, think of anything you know about the topic and read the questions.
- (2) Read the passage to find out what it is mostly about.
- (3) Think about what the details have in common, note down important facts, restructure the text using any form structural representation and put it in your own words

- (4) Think and ask question about what would make a good title.
- (5) Re-read the text if I don't know the answer to a question.

Pointing at the board and verbalizing each step, the teacher presented a modeled demonstration of the strategies by exemplifying the strategy in question as follows:

- (i) What do I have to do? The teacher once more emphasised the need to state one's goals for the sake of monitoring one's progress as an integral component of motivation. The instructor and the learners worked together to elicit their prior knowledge about the topic by predicting what they are likely to learn from the text: "Try to think of anything you know about the topic and what you are probably going to learn in the text just presented". The comprehension questions were then read as part of the goal or reading for a purpose.
- (ii) At the beginning of each reading session the instructor repeated this statement: "While you are working, it helps to keep in mind what you are trying to achieve." He/she explained that while he/she is reading the passage he/she would be thinking of what the details had in common. He/she then read the passage aloud and learners repeated it.

The passage was reviewed until learners understood the topic under discussion. The difference between category topic and examples of categories were demonstrated and the structure of the paragraph was discussed in terms of main ideas.

- (iii) He/she further explained that thinking what a good title might be, means going back to the common details and writing them in one word or sentence to make a title in line no 1 of Table 4.2 (Appendix H).

The teacher then led a short revision on organisation as a learning strategy (e.g. sorting things into categories or clustering according to shared attributes) and on the elaboration

strategies (identifying the common features—that link such items by activating prior knowledge/ experience).

The instructor explained that new information is easily assimilated if it can be fitted into an existing framework of ideas the learners already have in their minds. The need to focus on goals was stressed in all the sessions. The main ideas extracted from one of the passages were further used to demonstrate the formation of a hierarchical text structure representation.

The instructor put the key concepts into boxes and then arranged the concepts in order of importance using lines and arrows to show the relationship of ideas (key concepts at the top, followed by general concepts and specific concepts and examples toward the bottom Figure 4.3 represents the generic self-question with corresponding intended cognitive processes that the instructor explained and demonstrated (Appendix K).

Thus, the role of prior knowledge in these two processes and therefore, in text predictions, summaries and main idea extraction were explained and demonstrated.

During modeling, the instructor imitated a coping model by deliberately alternating correct and incorrect moves, such as extracting a wrong topic sentence and stating that “It is perfectly normal to make mistakes”.

Responses and reasons for successful and failed responses were discussed by referring to the passage, the steps followed and the strategy-information. The notions of goals and self-monitoring are reiterated while strategy-value feedback is given throughout the sessions.

In the third major moment of the cycle, participants observed the modeled instruction activities. Observation is a means of monitoring the effects, noting problems and the changes, the good practices and identifying key issues to be attended to and of evaluating processes.

Learners observed throughout the demonstrations so that they would be able to emulate the model in order to build a conceptual model of the necessary processes to be followed, until they were capable of self- control and self-directing by means of self-talk.

The teacher-participant also observed as learners coordinated their newly found learning strategies by applying them in both controlled and independent practice. The learners were also intermittently, prompted to verbalise their intentions and actions before and whilst applying the strategy.

The interaction and communication aspects were aimed at helping learners through introspection. The instructor kept asking: “How did you do it?” “How or why did you do that?” Dialogues and direct quotations of participants helped to make the observed processes as vivid as possible. Through observation, the instructor was enabled to provide appropriate strategy-value feedback.

Following each strategy-use demonstration, the learners worked on another text, for which the teacher provided guided practice. The teacher instructed learners to repeat aloud after her/his verbalization of each step and selected learner to take turns in performing the corresponding actions on the board. More examples were elicited from the learners. The facilitator continued to give strategy value feedback showing that they progressed well because they used strategies appropriately: “You got this right because you followed the steps correctly” or “You have been answering a lot more questions correctly since you started following the steps shown to you”.

Practice continued in sessions that lasted more than eight days. The process was repeated until all the steps were followed. All the time learners received strategy value feedback linking their success with the correct use of strategies. For the rest of the training sessions, the teacher did not explicitly model the strategies in order to allow learners to reflect and to practise independently.

Reflecting on the plans and observed actions is the fourth major moment of this action research cycle that is a necessary process in terms of thinking about the instructional engagements, thus identifying bad or good practice.

The investigator and instructors reflected upon the intervention programme and recorded the events so as to facilitate the solution of the problems and to enable analysis, interpretation and discussions of scores. Such reflection on the results may be used as a baseline for subsequent cycles of planning, action, observation and reflecting in a recurring way until the problem being investigated has been resolved.

Reflection-processes are carried over to the next two chapters where the scores will be statistically analysed, interpreted and discussed.

4.5.8 Post-tests

On the last week of treatment period both groups took part in a week long post-tests in order to evaluate the effectiveness of the intervention programme and also to find as to the effectiveness of learning strategies used by the experimental group in enhancing their self-efficacy perceptions and their academic achievement. The *post-tests* were in the form of interviews as well as pen and paper test similar to those performed in the *pre-tests*.

The study also used the same measuring instruments to assess self-efficacy, learning-strategies and reading comprehension achievement in the pre-test and the post- test. Procedures for the administration of questionnaires were also the same as for the pre-test.

4.5.9 Results

Scores were recorded. On completion of the questionnaires, each learner had two sets of raw scores for self-regulated learning, use of learning strategies, self-efficacy perception and reading comprehension performance derived from the pre- and post- tests. Learners' raw scores were all converted into percentages.

4.6 CONCLUSION

An attempt was made in this chapter to use the quasi-experimental approach concurrently with Zuber-Skeritt's (1993) four-moment cycle of action research to investigate the influence of learning strategies on learners' self-efficacy and academic achievement. The necessary data was collected using various instruments.

The chapter has also presented an overview of the training sessions that were conducted as an intervention process. The conversion of the raw scores into statistical data will form the subject of the next chapter.

CHAPTER 5

THE ANALYSIS AND INTERPRETATION OF THE RESULTS

5.1 INTRODUCTION

The main purpose of this chapter is to analyse and interpret the scores that were compiled from the learners' completed questionnaires and interviews as indicated in the previous chapter, in order to get a deeper insight into the relationship between the learning strategies, self-efficacy and the academic achievement of Black township primary school learners. Also reported in this chapter is the effectiveness of strategy-instruction in improving the learners' knowledge and use of strategies, and consequently, on self-efficacy and academic achievement in all the four grades.

The use of the literature survey and the quantitative and qualitative investigative methods were used to help define the variables and to provide guidelines for planning learning activities that efficiently set the learners on a path of academic success and life-long learning. Answers to the questions that were asked in section 1.7 are addressed in this chapter and the process of testing the hypotheses formulated in 1.8 is continued.

5.2 THE AIM OF THE RESEARCH

In section 1.5 it was indicated that the present research seeks to use quantitative, qualitative and statistical measures with the following primary aims in mind:

- i) To define, outline and explain learning strategies, self-efficacy and achievement.
- ii) To establish the extent of the teachers' and the learners' knowledge and use of learning strategies.
- iii) To assess the influence of learning strategies (cognitive and metacognitive learning strategies as well as the motivational) on learner self-efficacy and academic achievement in a scientific way.

- iv) To develop and evaluate programmes, activities and methods of implementation that will enable the researcher to examine the relationship between the learners' knowledge and use of learning strategies and their self-efficacy perception and their academic performance.
- v) To design, develop and evaluate programmes and activities as well as the methods that will determine the effectiveness of strategy-instruction and self-efficacy cultivation in promoting the knowledge and use of reading comprehension strategies and positive self-efficacy perceptions of the experimental group after the training the programme.
- vi) To establish the reliability of the programmes involved.
- vii) To investigate and outline will role that the school community, particularly teachers, could play with regard development of their learner's strategic behaviour.

Moreover, the study aims at teasing out debates among educators as well as bigger research projects involving more schools within the district with a view to replicating the study and testing whether the outcomes of the study can be applied in other areas, especially in other township primary school classrooms in future.

5.3 DATA ANALYSIS REPORTS

5.3.1 Introduction to the data analysis

The ensuing paragraph explains the arrangement of the remainder of this chapter, the outline of the reports, the details of each report and concluding remarks.

5.3.2 The organisation of the chapter

This chapter is arranged as follows: in section 5.5.2 the analysis of the Self-Regulated Learning Interview (SRLIS) scores are reported, while the report on the analyses of

learning strategies scores from the Motivated Learning Strategies Questionnaire (MLSQ) are presented in section 5.5.3, followed by a report on the analysis of learners' responses to the self-efficacy questions, also from MLSQ(S-e) in 5.5.4, and another self-efficacy data analysis report based on scores from the Children's Perceived Self-efficacy Scale (CPSES) in section 5.5.5. The last analysis is that of the learners' performance outcomes in 5.5.6.

5.3.3 The outline of the reports

The general structure of most of the reports is presented as follows:

a) The instrument

The set of operations or indicators that help in defining the attributes that were being measured and their scales have been presented as part of the instrument or measuring tool. The data analysis reports of the three variables were performed in scores obtained before intervention ('b' or 'before') and after ('a' or 'after') along the following lines:

b) Descriptive statistics (means and standard deviations), to serve as a basis for the comparison of the pre-test and the post-test responses.

Cronbach's coefficient of alpha, which is a measure of the reliability of the pre-test and *post-tests*. Reliability was also determined by means of factor analysis

c) Inferential statistics

- i) T-tests were computed to indicate the level of significance of the differences between group means; the levels of significance of the differences were determined by P-levels ($P < 0.05$ indicating significant differences).
- ii) The Analysis of Variance (ANOVA) was performed to test whether the differences between and within the groups are larger than could reasonably be expected by chance.

All the reports of the investigation on the influence of the learning strategy on their self-efficacy perceptions and academic performance and on the effectiveness of strategy intervention have been presented with the help of tables, bar and line graphs that explain the situation before and after intervention.

5.3.3.1 Report on the Self-Regulated Learning Strategies Interview Schedule (SRLIS)

a) The instrument

In the Self-Regulated Learning Strategies Interview learners responded to the following 16 questions:

- 1.1 In preparing for a test I have a method that will help remind me with what was discussed for the test.
- 1.2 What I do if I have trouble understanding or remembering what was discussed.
- 2.1 I have a method or methods that help me plan a history paper that affects my report card Grade.
- 2.2 What I do when I have problems with the topic.
- 3.1 What I do when I do not understand maths problems at home.
- 3.2 What I do if it is a very difficult problem.
- 4.1 I have methods of checking my science or language grammar exercises when they are done.
- 4.2 What I do if the assignment is difficult.
- 5.1 I have a special method of preparing for the end of term-test.
- 5.2 When the tests are especially difficult, I have a plan.

- 6.1 When taking a test, I have a method for obtaining as many answers as possible.
- 6.2 If the test questions are very difficult, I have a method.
- 7.1 I can motivate myself even when I have difficulty completing the homework assignments although there are other interesting things to do.
- 7.2 I can meet pressing deadlines.
- 8.1 I have a way of arranging an appropriate place where I can study.
- 8.2 What I do if I still cannot concentrate despite the well-arranged place to study.

The respondents were required to assess these statements on a 5-point scale (1: Not well at all, 2: Not very well, 3: Somewhat well, 4: Fairly well, 5: Very well). A means score of more than 3 would imply “Well”, and a means score of less than 3 would imply “Not well”.

As in the case of all following variables, descriptive statistics were compiled in this section.

b) Descriptive statistics

Figures 5.1 to 5.16 show the means scores of responses to individual items of the Self-Regulated Learning Interview Schedule.

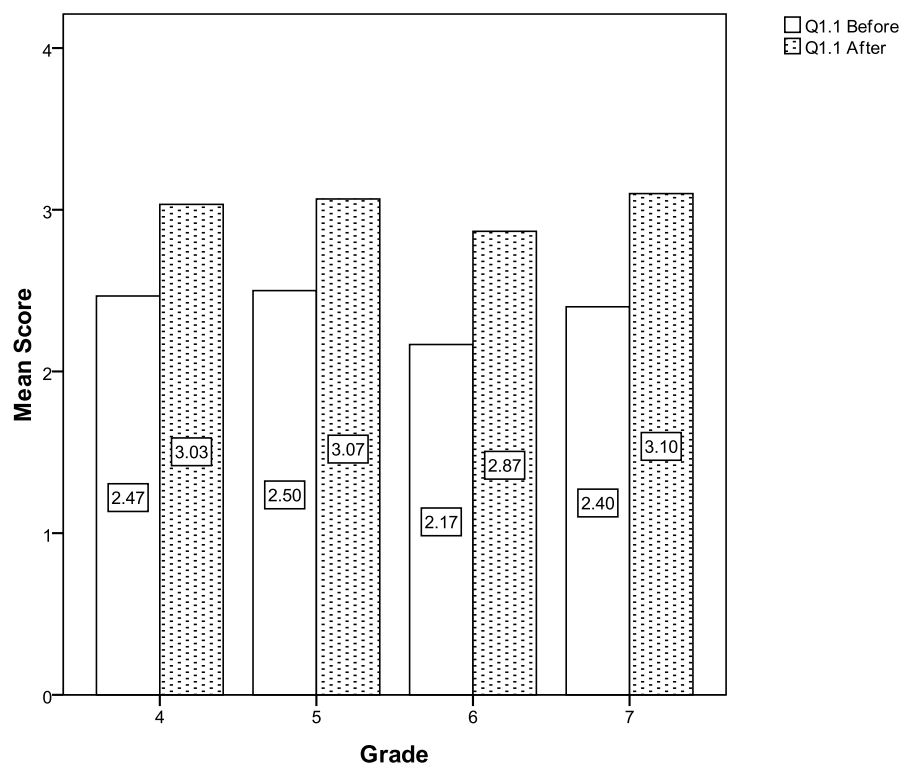


Figure 5.1: Grade means of responses to Statement 1.1 of the Self-Regulated Learning Interview Schedule before and after intervention

For statement 1.1: 'In preparing for a test I have a method that will help remind me of what was discussed for the test', the means of the response of all grades were below 3 in the 'Not very well'-bracket before intervention. Grade 5 scored the highest with 2.57. After intervention all the means scores increased to a little more than 3, except for Grade 6, which remained the lowest, though it increased from 2.17 to 2.87. The increases were equal and higher in the higher grades (.70) than in the lower ones, which increased by .56 and .57 in Grades 4 and 5 respectively.

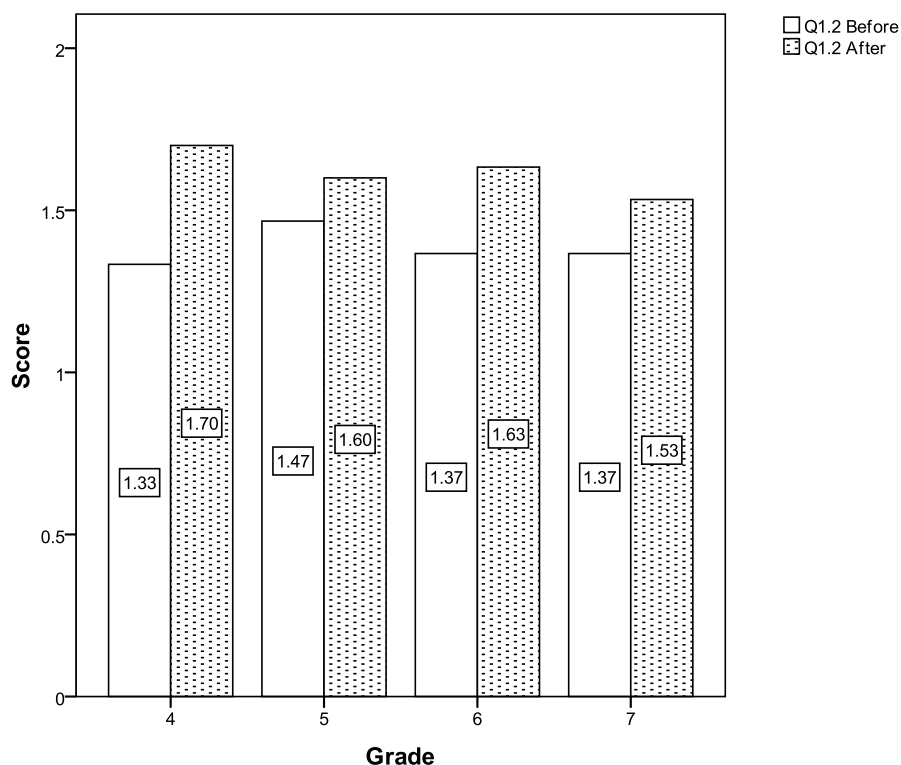


Figure 5.2: Grade means for Statement 1.2 and follow-up to 5.1

For statement 1.2: ‘What I do if I have trouble understanding or remembering what was discussed’, Grade 5 had the highest means score of 1.47 before intervention, and Grade 4 had the lowest with 1.33. However, the situation was reversed with Grade 4 scoring the highest at 1.70, and Grade 5 scoring lowest at 1.60. Although the means scores changed after intervention, they still remained below 2 (Not well at all). Grade 4 showed the highest improvement after intervention (0.37), followed by Grade 6 (.26), while the Grades 5 and 7 indicated the lowest increase, namely .13 and .16 respectively.

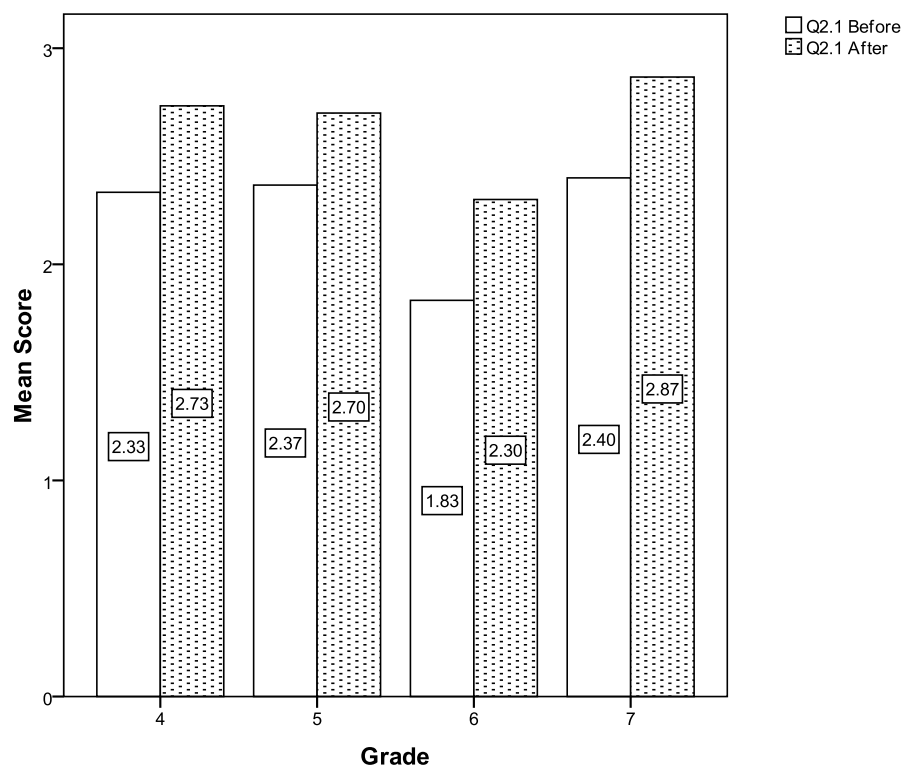


Figure 5.3: Means score for Statement 2.1

For statement 2.1: 'I have a method or methods that help me plan a history paper that affects my report card Grade', Grade 6 had the lowest means score before and after the intervention, while Grade 7 registered the same increase of .47 after intervention, which was the highest score before and after intervention. These were followed by Grades 4 and 5, with increases of 0.40 and 0.33 respectively. Only Grade 6 moved from 1, or the 'not well at all'-bracket to slightly more than 2, 'not very well'. All the others also shifted slightly after intervention, but within the same bracket (not very well), as before the intervention.

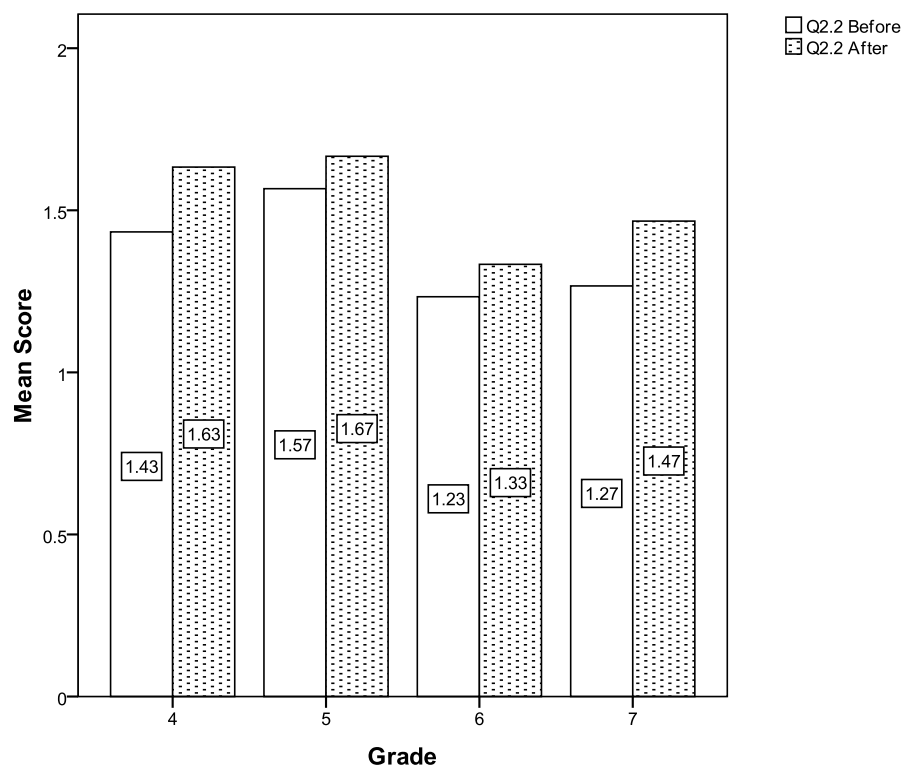


Figure 5.4: Means scores for Statement 2.2 'What I do when I have problems with the topic.'

For statement 2.2, the means scores of all the grades before and after the intervention were above 1 (not well at all). Grades 4 and 5 had higher means scores before and after the intervention than Grades 6 and 7. Grades 4 and 7 registered the highest increase of 0.20 in the scores, and the Grades 5 and 6 means scores' raise was the lowest at 0.10 each. The learners did not quite know what to do when they had difficulties with a topic.

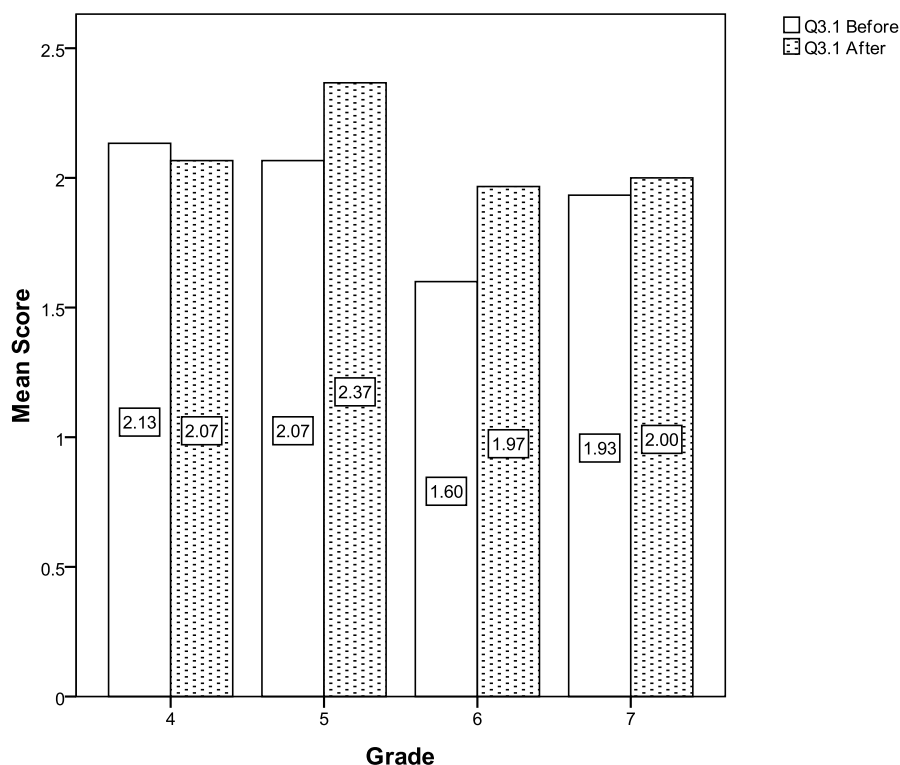


Figure 5.5: Means scores for Statement 3.1

In response to ‘What I do when I do not understand maths problems at home’, Grade 5 had the highest means score before and after the intervention, but its slight upward move was within the ‘not very well’-bracket. Grade 4 also shifted within the same bracket (2), but it showed a negative move or decrease by 0.06 in responses after intervention. Grades 6 and 7 were the lowest with 1.60 and 1.93 (not well at all) before intervention, but Grade 7 shifted to 2 (not very well) after intervention. However, improvement in Grade 6 was equal to that of Grade 5 at 0.30, which was far more than the increase in Grade 7. The solution of maths problems received one of the lowest improvement scores in all the grades.

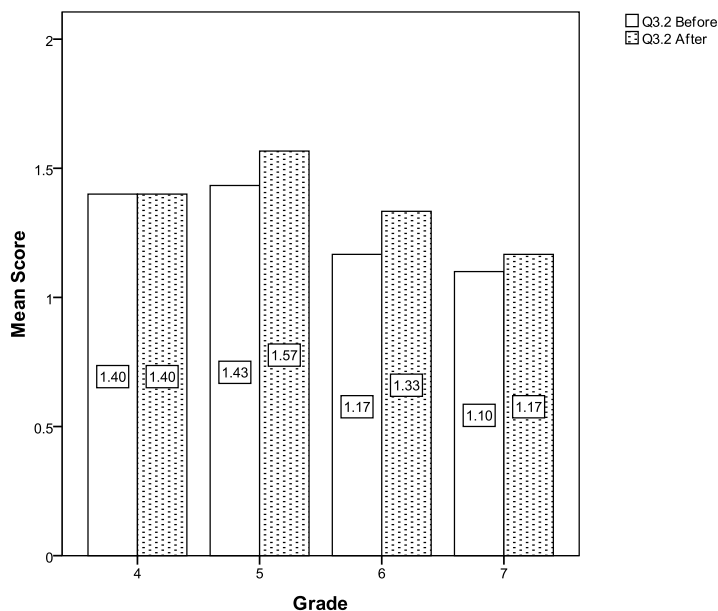


Figure 5.6: Means scores for Statement 3.2: ‘What I do if it is a very difficult problem.’

As a sequel to 3.1 above, 3.2 got one of the worst responses of ‘not well at all’ both in the pre-test and post-test. The increase in the Grades 4, 5, 6 and 7 scores were .00, 0.14, 0.16 and 0.07, respectively. While Grade 5 had the highest mean scores, Grade 7 had the lowest means scores before and after intervention. This may be an indication that the difficulty levels are more challenging in Grade 7.

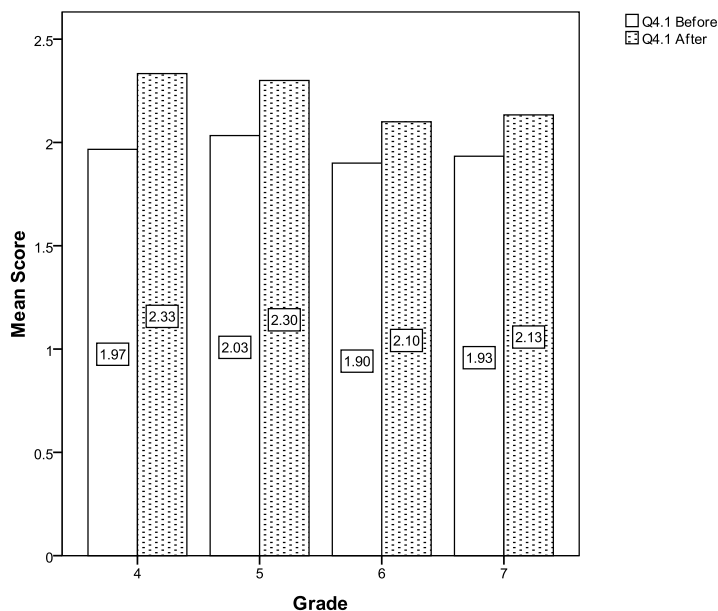


Figure 5.7: Means scores for Statement 4.1

Grades 4 and 5 had higher means scores before and after the intervention than Grades 6 and 7 had for the statement, ‘I have a method of checking my Science or language grammar exercises when they are done’. Their means increased by .36 and .27 after intervention, thus shifting Grade 4 from 1 (not well at all) to 2 (not very well), and Grade 5 moved higher within the ‘not very well’-category. Grades 7 and 6 moved from a higher level one to a lower level two. For statement 5.7, the means of Grades 6 and 7 increased by only .20.

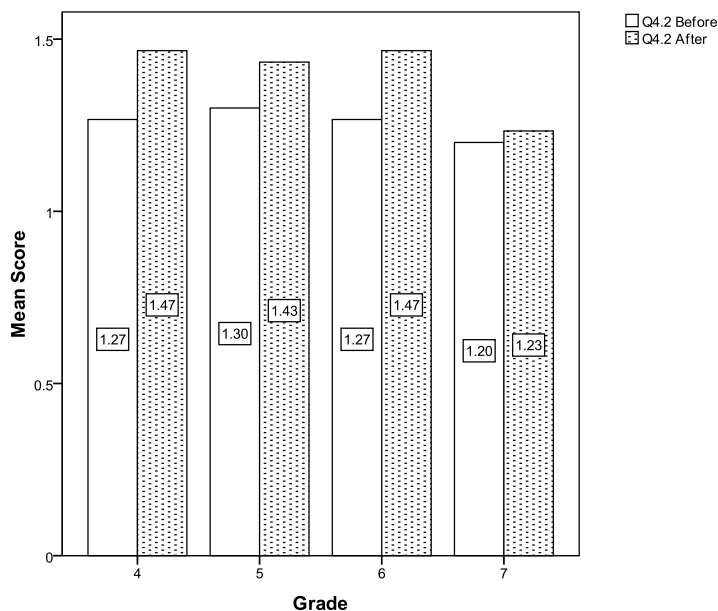


Figure 5.8: Means scores for Statement 4.2: 'What I do if the assignment is difficult.'

All the grades' means scores for the solutions of difficult assignments indicated that the responses improved after intervention, but that they shifted slightly upwards within the first bracket (not well at all). Grades 4 and 6 scored equal means in both the pre-test and the post-test, with a change of .20 each. Grades 5 and 7 had the lowest means scores before and after the intervention (130-143 and 120-123 respectively).

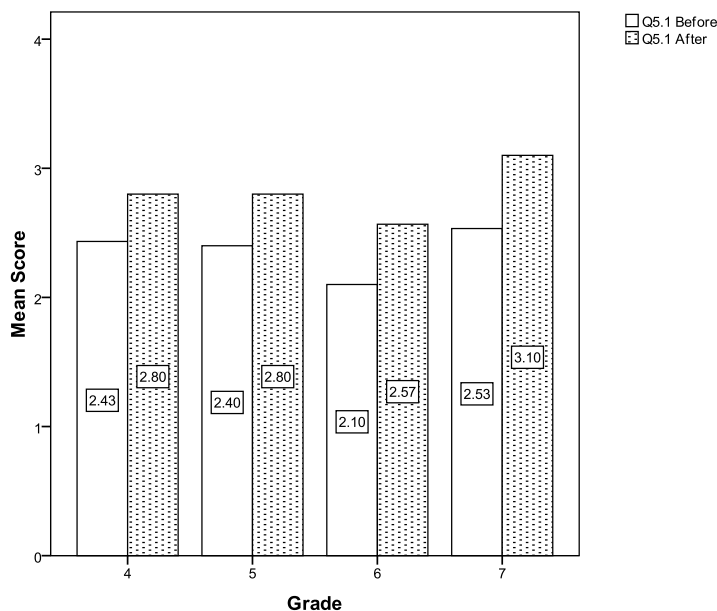


Figure 5.9: Means scores for Statement 5.1: 'I have a special method of preparing for the end of term-test.'

From Figure 5.9 it is clear that Grade 7 had the highest means scores before and after the intervention, with an increase of 0.57, which is the highest increase of all the grades after intervention. Whereas the improvement of all the other grades was just a slight move within the same bracket 2 (not very well), Grade 7 was able to move into bracket 3, which equals 'somewhat well' or 'well'. Grade 6 again showed the lowest means scores before and after intervention. The increase ranged from 0.37, 40, 0.47 and 0.57 for Grades 4, 5, 6 and 7.

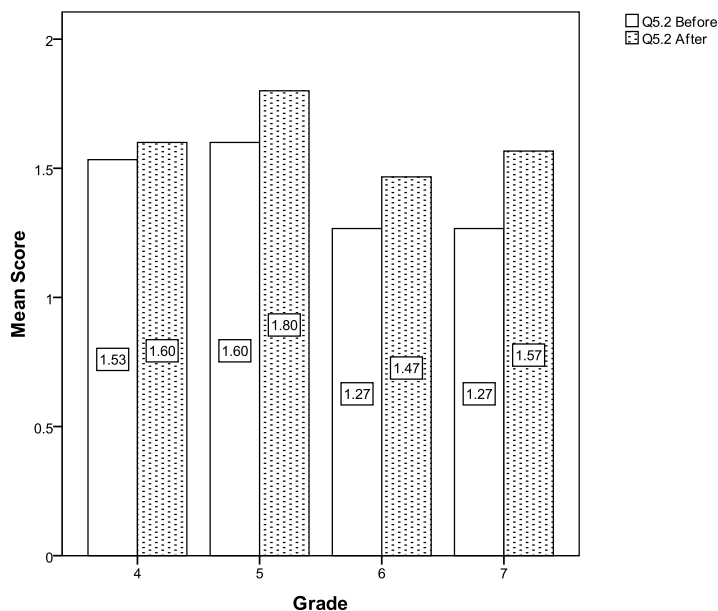


Figure 5.10: Means scores for Statement 5.2: ‘When the tests are especially difficult, I have a plan.’

In Figure 5.10, all the pre-test and post-test means were in the ‘not well at all’ bracket. Grade 5 had the highest means scores before and after intervention (1.60 and 1.80), followed by Grade 4, with 1.53 before and 1.60 after interventions. The two higher Grades (6 and 7) got equal scores of 1.27 before intervention, but the scores increased by .20 in Grade 6 and by .30 in Grade 7. This can be translated as learners’ lack of strategies and motivation to initiate their own path to success; even the intervention did not result in noticeable improvements in this respect.

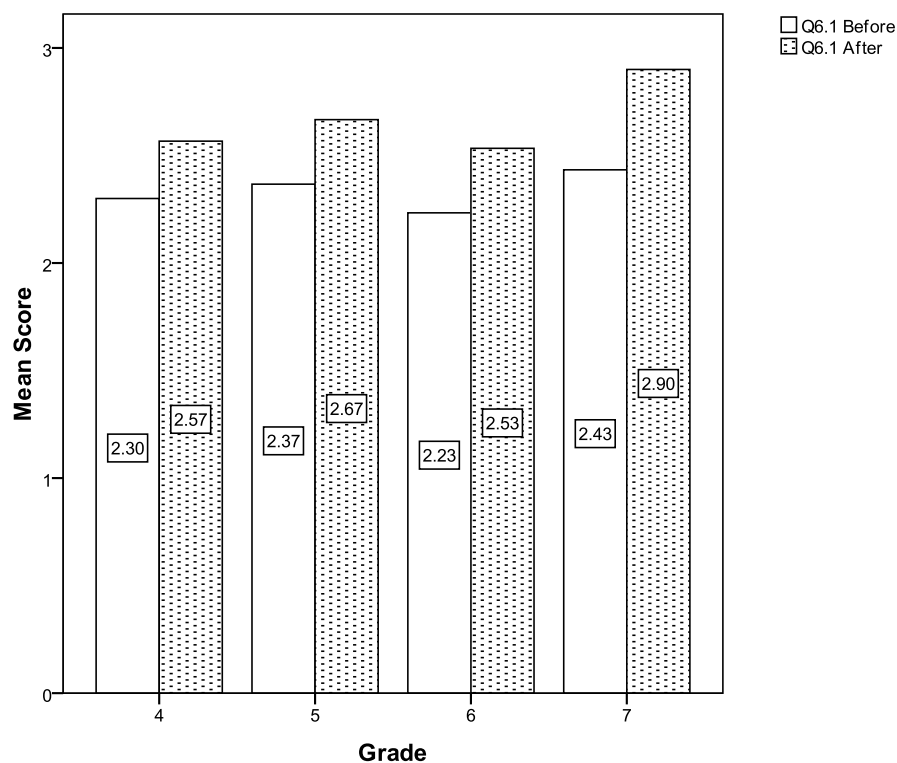


Figure 5.11: Means scores for Statement 6.1

The means scores for statement 6.1 in Figure 5.11, ‘When taking a test, I have a method for obtaining as many answers as possible’, show that before and after the intervention all the grades were at level 2 (not very well). Grade 7 had the highest means scores and Grade 6 the lowest on both occasions. There was a 0.30 increase in the responses of Grades 5 and 6, which is second highest, after Grade 7 with a .47 increase after instruction. Grade 4 had the lowest increase of .27.

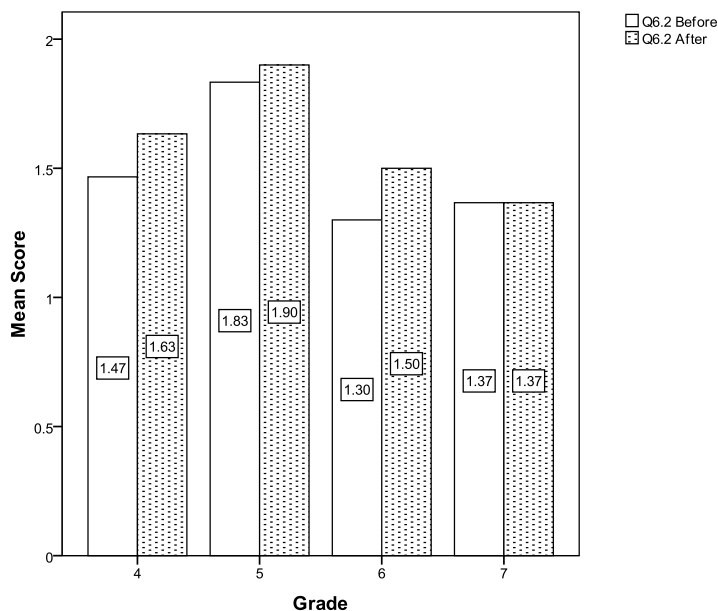


Figure 5.12: Means scores for Statement 6.2

According to Figure 5.12, Grade 5 scored the highest and Grade 7 scored the lowest means, with no improvement after the intervention, for statement 6.2: 'If the test questions are very difficult I have a method'. Though Grade 6 had the second lowest means (after Grade 7), it showed the biggest improvement of 20 compared to 0, 0.07 and .16 for Grades 7, 5 and 4; but all the means reflect the 'not well at all'-response in all the grades. Once more, it is interesting that the increases in the Grades 5 and 7 means scores were lower than those of Grade 4 and Grade 6.

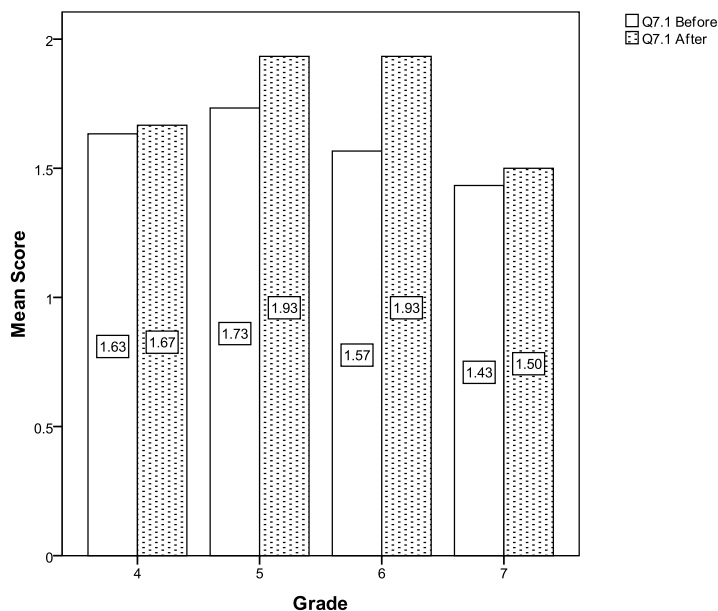


Figure 5.13: Means scores for Statement 7.1: ‘I can motivate myself even when I have difficulty completing homework assignments although there are other interesting things to do.’

Figure 5.13 shows that although Grades 5 and 6 scored differently in the pre-tests, they both scored 1.93 in the post-tests. The highest increase in responses, namely 7.1, were recorded in Grade 6 (0.36), followed by Grade 5 (0.20). The lowest increases were in Grade 4 (0.04) and Grade 7 (0.07). In the pre-test and the post-test all the means were an indication that learners are “not good at all” in self-discipline and motivation to persevere.

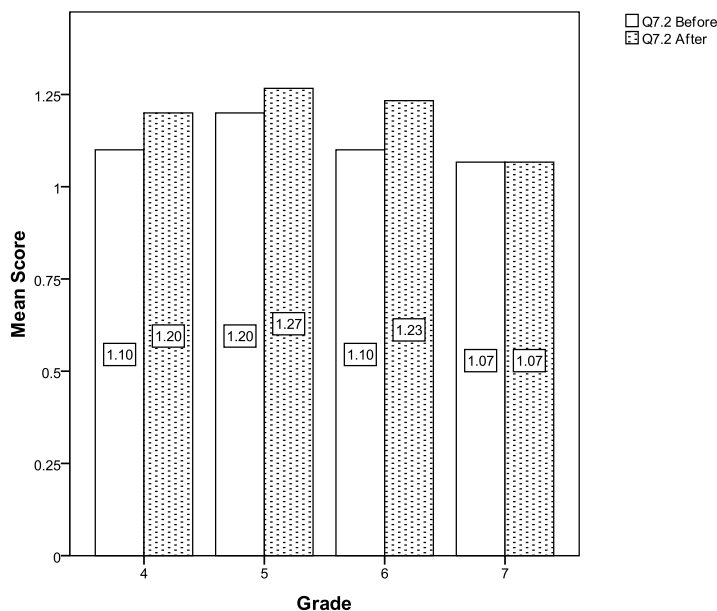


Figure 5.14: Mean scores for Statement 7.2: 'I can meet pressing deadlines.'

In the scores of the follow-up to 7.1, statement (7.2) presented a further reflection of poor discipline, poor self-regulation and meta-cognitive strategies. The Grade 7 scores of 1.07 before and after instruction show that there had been no change (00). The 1.10 scores in Grades 4 and 6 before intervention differed only 3 in their after-intervention increase. All the Grades registered a meagre improvement, and all the pre-test and post-test means still put the learners in the lowest bracket of 1 or 'not well at all' in the 'meeting deadlines'-category.

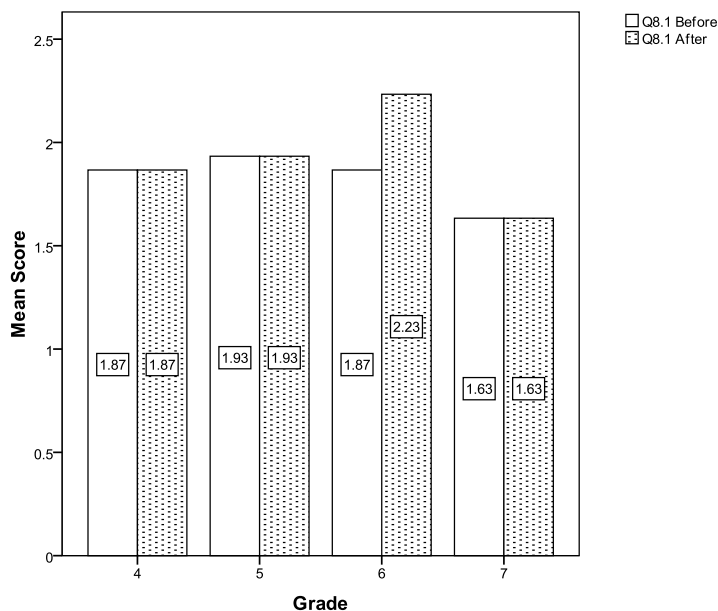


Figure 5.15: Means scores for Statement 8.1 'I have a way of arranging an appropriate place where I can study.'

In Figure 5.15, only Grade 6 showed a slight after-intervention improvement of .36 from bracket 1 to 2. All the other grades had the same means scores and the same position of being 'not good at all' in the pre-test and post-intervention.

This means that most learners are not good at all when it comes to creating a space that is conducive to learning, except learners in Grade 6, whose response was that they can arrange such a space, but is 'not good enough' at doing so.

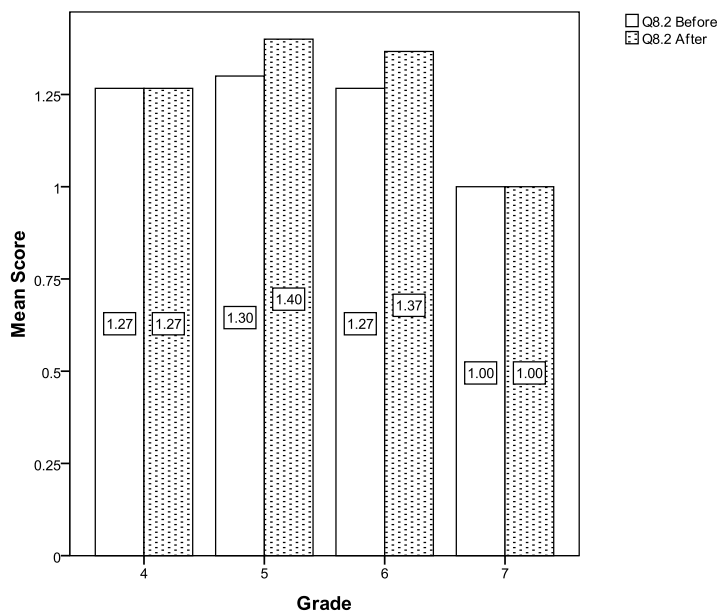


Figure 5.16: Means scores for Statement 8.2: ‘What I do if I still cannot concentrate despite the well-arranged place to study.’

In a follow-up to 5.15 above, Grades 4 and 7 scored the lowest in the pre-test and no change in the post-intervention. Only Grades 5 and 6 showed some improvement of .10 each after the intervention. All the means scores indicated the ‘not well at all’-outcome for all the grades for statement 8.2.

The results revealed that all the grades improved after the intervention. In the lead was Grade 5, followed by Grade 7. However, the improvement after the intervention, while positive, was not very dramatic. The gains were rather low and very insignificant in almost all the cases, which was an indication that even the training for self-regulated learning had not been effective. The “not well at all” responses in this interview were a sign of a general lack of self-regulating strategies, or the inability to use the strategies they had learnt during training. These and other low scores indicate a dire need for learning strategy-training, especially in self-regulatory strategies.

On the basis of these results, alternative hypothesis 5.2.5 (Ha5): Strategy-training improves learners’ knowledge and use of learning strategies can be accepted. The little

upward moves indicate the possibility that with consistent instruction, the learners will improve their knowledge and use of self-regulatory learning strategies with time.

c) The reliability of the responses to the self-regulated learning interview

The Cronbach Alpha was used (Tables 5.1 'a' and 5.1 'b') in this section to measure the consistency of the responses. An Alpha value that is above 0.8 is regarded as very good, and between 0.6 and 0.8, it is acceptable.

i) Before the intervention

Reliability statistics

Cronbach's Alpha	No. of items
0.864	16

Table 5.1 'b': The reliability of the scores before intervention.

ii) After the intervention

Reliability Statistics

Cronbach's Alpha	No. of items
0.733	16

Table 5.1 'a': The reliability of the scores after intervention

With the Alpha of .864 'before', and .733 'after' intervention, the responses may be regarded as reliable. Therefore, an average of the 16 statements was computed as an index of self-regulation for the responses elicited before and after the intervention.

d) Inferential statistics

Paired and multiple samples statistics were used to compare the means scores 'after' and 'before' of each group in tables 5.2 and 5.2 b. First a t- test, then the analysis of variance (ANOVA) would be computed.

i) T-test

Table 5.2 shows the descriptive statistics showing the mean scores and standard deviations of each group before and after intervention. These statistics were performed as a basis for the t-tests in Table 5.3.

Paired Samples Statistics

Grade		Means	Std. Deviation
4	Self-regulation (After)	1.9354	.30375
	Self-regulation (Before)	1.7458	.31697
5	Self-regulation (After)	2.0250	.30113
	Self-regulation (Before)	1.8188	.32800
6	Self-regulation (After)	1.8646	.27074
	Self-regulation (Before)	1.5771	.27693
7	Self-regulation (After)	1.8521	.26944
	Self-regulation (Before)	1.6458	.31200

Table 5.2: The descriptive statistics showing pre- and post-test means per grade

Table 5.3 represents the t-test used to show the comparison between the mean scores of the experimental group's pre-tests and post-tests. The critical level of significance is 0.05.

The null hypothesis (**Ho**) and the alternative (**Ha**) for the significance of the difference in the pre- test and post- test use of self-regulated learning strategies after intervention read as follows:

Ho5: Strategy-training does not significantly improve learners' knowledge and use of learning strategies by the experimental groups.

Ha5: Strategy-training significantly improves learners' knowledge and use of learning strategies by the experimental groups.

Paired Samples Test

Grade		Paired differences				
		Means	Std. deviation	t	df	P-value
4	Self-regulation (After) – Self-regulation (Before)	.18958	.28640	3.626	29	.001
5	Self-regulation (After) – Self-regulation (Before)	.20625	.34591	3.266	29	.003
6	Self-regulation (After) – Self-regulation (Before)	.28750	.21501	7.324	29	.000
7	Self-regulation (After) – Self-regulation (Before)	.20625	.18580	6.080	29	.000

Table 5.3: Paired Samples Statistics - t-tests for self-regulation strategies

For the higher grades (5 to 7), the average difference in the responses between the pre-tests and the post-tests is .2. With the mean difference of .28750, Grade 6 is the highest and it can be interpreted as the most improved group. The Grade 4 means difference of

.18958 is the least improved although it is moving closer to .2. With P-values of less than .005(5%) level of significance, all the means differences are statistically significant. Thus, causing the rejection of:

Ho5: Strategy-training does not improve learners' knowledge and use of learning strategies.

ii) ANOVA

In Table 5.4 the descriptive statistics to find the means of all the grades' means and standard deviations before and after the intervention, as well as their differences (improvement) to serve as a basis for the computation of the Analysis of Variance tests (ANOVA), which was calculated in Table 5.5.

Descriptive statistics

		Mean	Std. Deviation
Self-regulation (Before)	4	1.7458	.31697
	5	1.8188	.32800
	6	1.5771	.27693
	7	1.6458	.31200
	Total	1.6969	.31896
Self-regulation (After)	4	1.9354	.30375
	5	2.0250	.30113
	6	1.8646	.27074
	7	1.8521	.26944
	Total	1.9193	.29140
Self-regulation (Improvement)	4	.1896	.28640
	5	.2063	.34591
	6	.2875	.21501
	7	.2063	.18580
	Total	.2224	.26514

Table 5.4: 'Before' and 'after' mean, standard deviation and means differences (improvement) between grades

With the score of .2224 total means differences' score of the grade means in Table 5.4, there is an indication that there of a slight improvement in the self regulation of the learners after treatment. The Grade 6 improvement-level was the highest at .2875, followed by Grades 5 and 7 with equal scores of .2063. Grade 4 registered the lowest with .18646. Generally, the differences were not dramatic.

ANOVA

		Sum of squares	df	Mean square	F	P-value
Self-regulation (Before)	Between groups	1.026	3	.342	3.581	0.016
	Within groups	11.080	116	.096		
	Total	12.107	119			
Self-regulation (After)	Between groups	.568	3	.189	2.304	0.081
	Within groups	9.536	116	.082		
	Total	10.105	119			
Self-regulation (Improvement)	Between groups	.175	3	.058	0.827	0.482
	Within groups	8.190	116	.071		
	Total	8.366	119			

Table 5:5: ANOVA/F-tests for self-regulation strategies

The only significant difference was in the 'before' (0.016), because its value was less than 0.05 and making the null hypothesis to be accepted. The other P-values were above 0.05, which means the null hypothesis was not rejected.

iii) *Multiple comparisons (Bonferroni)*

Dependent variable	(I) Grade	(J) Grade	Means difference		
			(I-J)	Std. error	Sig.
Self-regulation (Before)	4	5	-.07292	.07980	1.000
		6	.16875	.07980	.220
		7	.10000	.07980	1.000
	5	4	.07292	.07980	1.000
		6	.24167*	.07980	.018
		7	.17292	.07980	.194
	6	4	-.16875	.07980	.220
		5	-.24167*	.07980	.018
		7	-.06875	.07980	1.000
	7	4	-.10000	.07980	1.000
		5	-.17292	.07980	.194
		6	.06875	.07980	1.000

Table 5.6: Multiple comparisons: between group means differences

* The means difference is significant at the 0.05 level.

The only significant difference for the before-test was between Grades 5 and 6. All the other P-values were above the significance level of 0.05, thus the results of the SRILIS are mixed.

5.3.3.2 *The report on the learning strategies data (MLSQ)*

a) The instrument

The following strategy-related statements were put to the respondents, and they were asked to comment on each indicator on a 5-point scale, namely: 1: Very untrue of me, 2: Untrue of me, 3: Not sure, 4: True of me, 5: Very true of me.

1. I put together information from the class and from textbooks when I study.
2. I remember all the class information to answer homework questions correctly.
3. It is hard to decide what the main ideas are when I study. (*R)
4. I put important ideas into my own words when I study.
5. I always try to understand what the teacher is saying even if it does not make sense.
6. When studying, I try to remember as many facts as I can.
7. When studying, I copy notes to help me remember the material.
8. When I study I practise saying important facts over and over to myself to retain the information.
9. I use what I already learned from old assignments and from textbooks to do new assignments.
10. I outline the chapters in my book to help me study.
11. When I study, I construct pictures that help me to understand and remember the material.
12. I ask myself questions to be sure I know the material I have been studying.
13. When the work is difficult, I either give up or study only the easy parts. (*R)

14. I work on practice exercises and answer end of chapter-questions even when I don't have to.
15. Even when the study material is dull and uninteresting, I keep working until I finish.
16. When I begin to study, I try to determine what I need to learn and what to do to learn it.
17. After reading for the class I often find that I don't know what it's all about. (*R)
18. I find that when a teacher is talking I think of other things and don't really listen to what's being said. (*R)
19. When I'm reading, I stop once in a while and go over what I've read.
20. I work hard to get a good grade even if I don't like a learning area or a class.

*R: These questions were formulated in such a way that a high score indicated a poor learning strategy, whereas the rest of the questions were formulated in such a way that a high score indicated a positive learning strategy. Before an index could be constructed combining all the questions into an overall learning strategy score, the questions marked (*R) had to be reflected (an answer of 5 counting as 1, a 4 becoming a 2, etc.)

Descriptive statistics were computed for each question, before and after intervention, and for each grade. A means of less than 3 indicated that the respondents were inclined mostly to select "very untrue" or "untrue of me" in the case of the questions not marked (*R), and "very true" or "true of me" in the case of the questions marked (*R) before reflection (Appendix). The summary statistics in what follows are the statistics after reflection in the case of the (R*) questions.

The null hypothesis (Ho) and the alternative (Ha) for the significance of the difference in the pre- test and post- test use of self-regulated learning strategies after intervention read as follows:

Ho5: Strategy-training does not improve learners' knowledge and use of learning strategies.

Ha5: Strategy-training improves learners' knowledge and use of learning strategies

b) Descriptive statistics

For this report, the descriptive and inferential statistics for all the groups will be presented by means of graphs and tables, starting from Figure 5.17 to Figure 5.21 and Tables 5.7 to 5.12 respectively. The diagrams and the tables reflect the mean scores before and after intervention.

i) The Grade 4 report

Figure 5.17'b' illustrates that in Grade 4 the means of all the indicators were below 3 before the intervention, which means the participants' responses were 'very untrue of me'(1) or (2) 'untrue of me'. The highest means is 2.47 in bars 11 and 12, which is equivalent of "untrue of me" that a learner "constructs pictures that help them to understand and remember study material" and "asks questions to be sure they know the material being learned". The responses for statement 2, "I remember class information to do my homework", and 3, "I find it hard to decide what the main idea is", were lowest at 1.90 "very untrue".

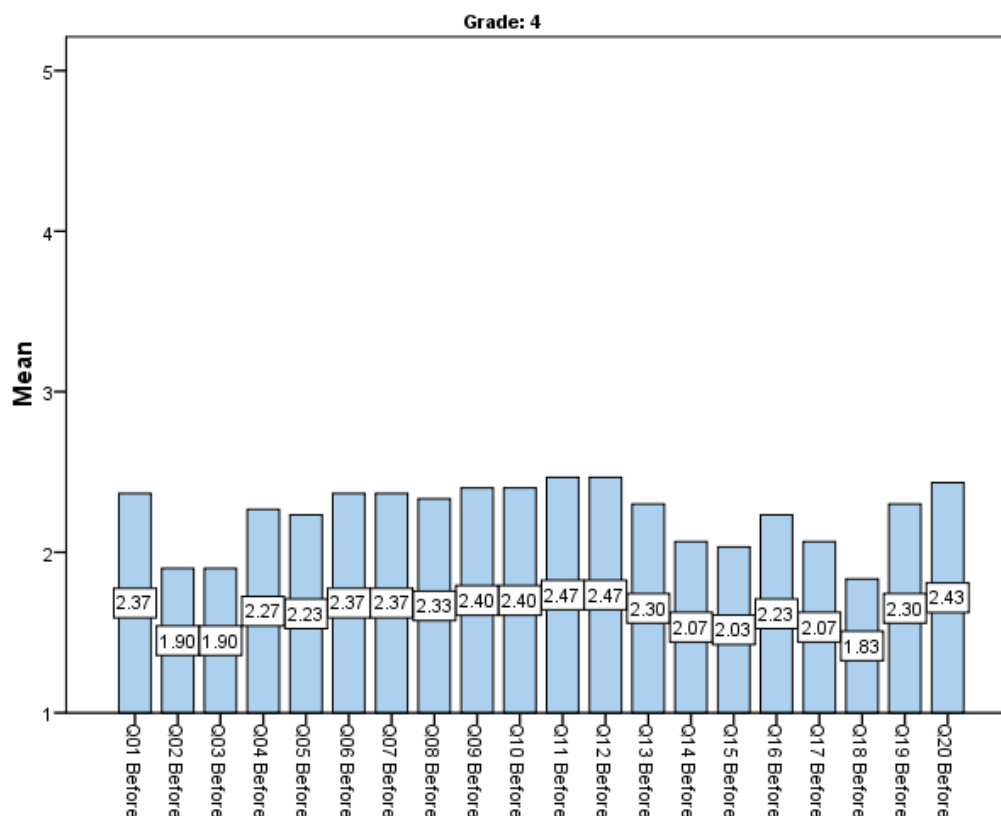


Figure 5.17 ‘b’: The means of Grade 4 responses to MLSQ items before intervention

The ‘after’ responses displayed in Figure 5.17 ‘a’ showed an improvement compared to the pre-test situation. At least statement 1: ‘I put together information from class and from textbooks when I study’ and statement 10: ‘I outline chapters in my book to help me study’ had achieved a means of 3 (unsure), when the rest, though improved too, were still on the level of ‘untrue’. The highest numbers of increases were .60 and .63 for statements 1 and 10. The improvement was not good enough, but there was hope that if the strategy instruction-programme continued, more Grade 4 responses would improve and their means would move to level 3, and other higher brackets.

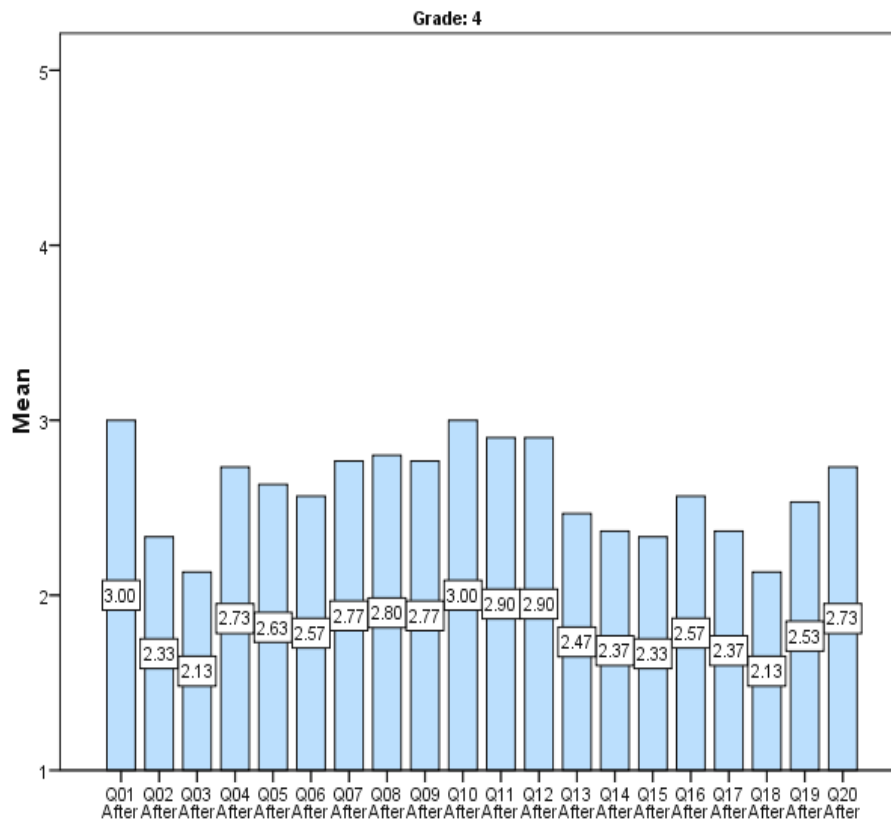


Figure 5.17 ‘a’: Grade 4 means of responses to all MLSQ learning strategies items after the intervention

ii) The Grade 5 report

According to Figure 5.18 ‘b’, all the means were below 3 but above 1, meaning that the learners still responded with “untrue of me” to all strategy-use statements. Statement 20 had the highest responses with a means of 2.53 “Working hard for good grades”, followed closely by 8 with 2.47 for “Saying facts over and over to myself for retention”, respectively.

The lowest means (2.07) were for statement 2: “Remembering class-work to answer homework questions”. A number of learners elaborated on the information they knew, or on what they had learnt.

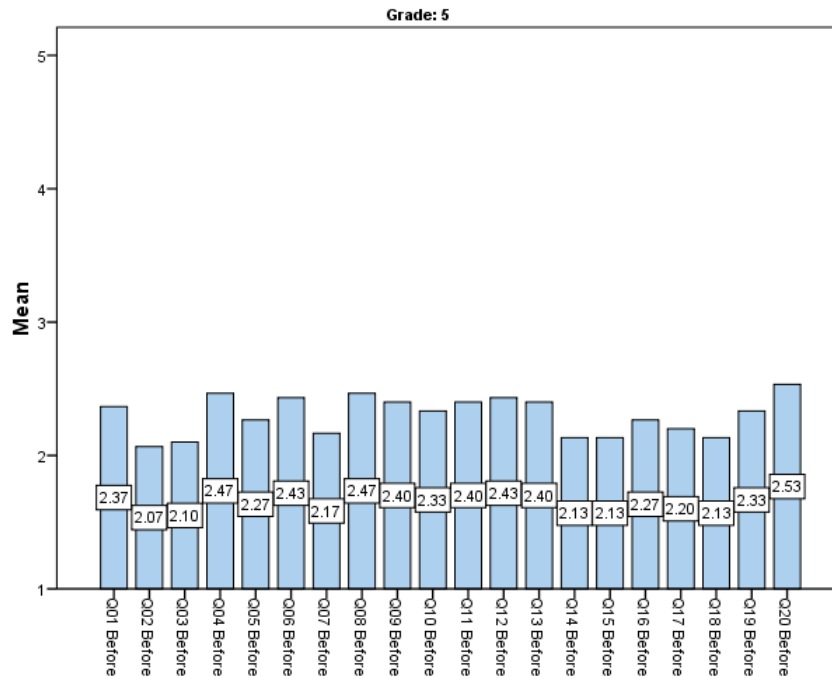


Figure 5.18 ‘b’: Grade 5 responses to MLSQ learning strategies items before (‘b’) intervention

None of the means in Figure 5.18’a’ below have reached 3. This means they were all in the “untrue” and “very untrue” categories. The highest responses, which were also closest to 3, were for statements 1 (putting together information from books and class), number 8 (tendency to rehearse information) and statement 12 (tendency to self-question when learning) with means of 2.97 in all three cases. Statements 14 and 15 had the lowest means of 2.33, each having increased by .20. It indicates that fewer learners took the initiative to practise on their own, and that the same number of learners had no motivation to persist through unfavourable conditions. Statement 1 gained by .60 while others gained less after intervention. The lowest gains were .13 for number 3, and .17 for numbers 18 and 20.

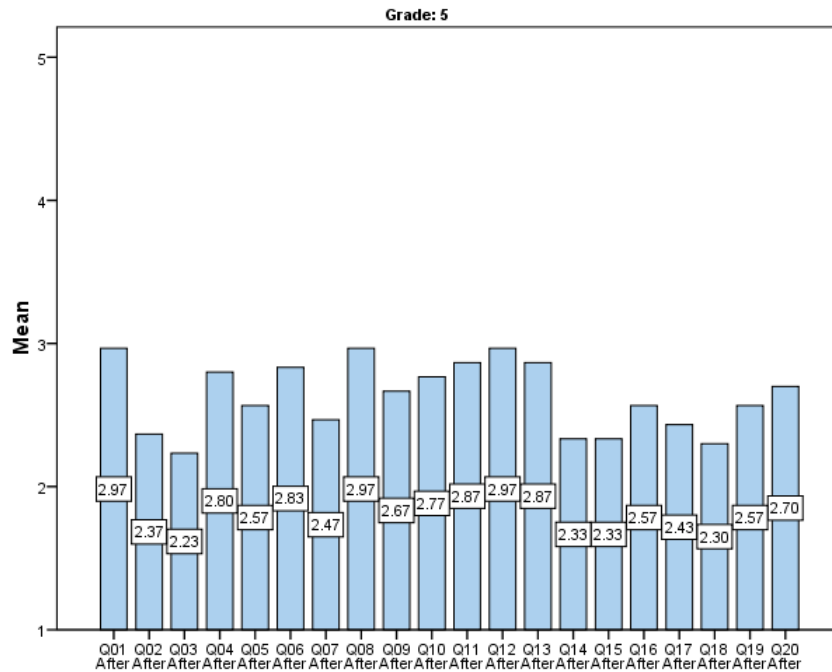


Figure 5.18 ‘a’: The means of Grade 5 responses to the MLSQ learning strategy-use items after intervention

iii) The Grade 6 report

In Figure 5.19 ‘b’ statements 2 and 20 had the highest responses (2.80) for ‘Remember all class information to answer homework questions correctly’ and (2.83) for ‘Work hard to get good grades even if the learning area is not liked.’ However, their means were above 1, but below 3 like all the others in this grade, meaning that they were inclined to answer “untrue”.

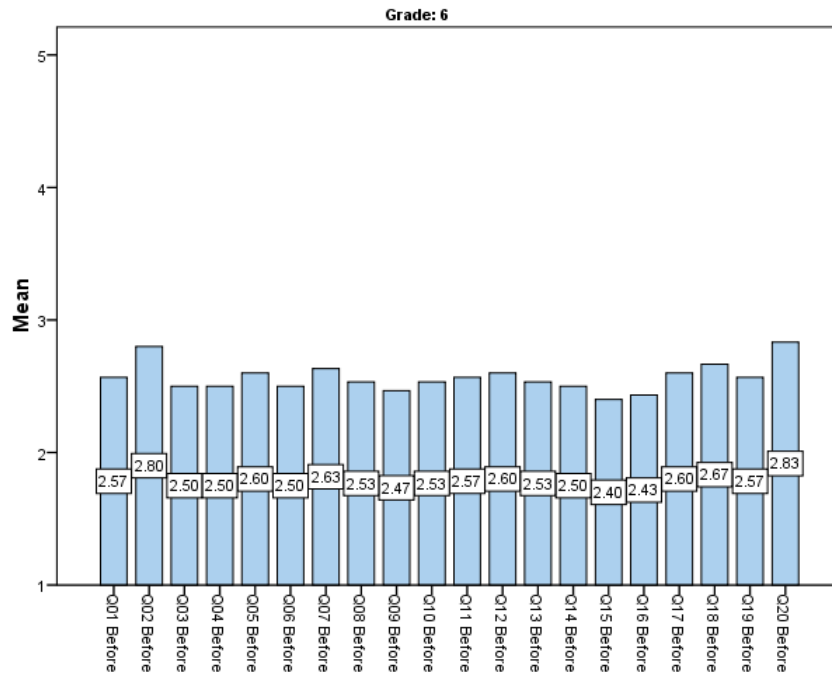


Figure 5.19 “b”: The means of Grade 6 responses to the learning strategies questionnaire before intervention

There are more statements whose responses had gone up to 3 and above, but below 4 in Figure 5.19 ‘a’, which translates as ‘unsure’. The highest means score were 3.20 (number 20), followed by 3.13 (number 11), 3.10 (number 4), 3.03 (numbers 6 and 1) and 3 (numbers 9 and 10). Numbers 2 and 7 with 2.97 were very close to 3, although they were still in the “untrue” category. As in other previous reports, the increase of learners who indicated the difficulty to find the main idea in post-intervention (number 3) responses is a matter of concern. In other words, the training did not benefit them.

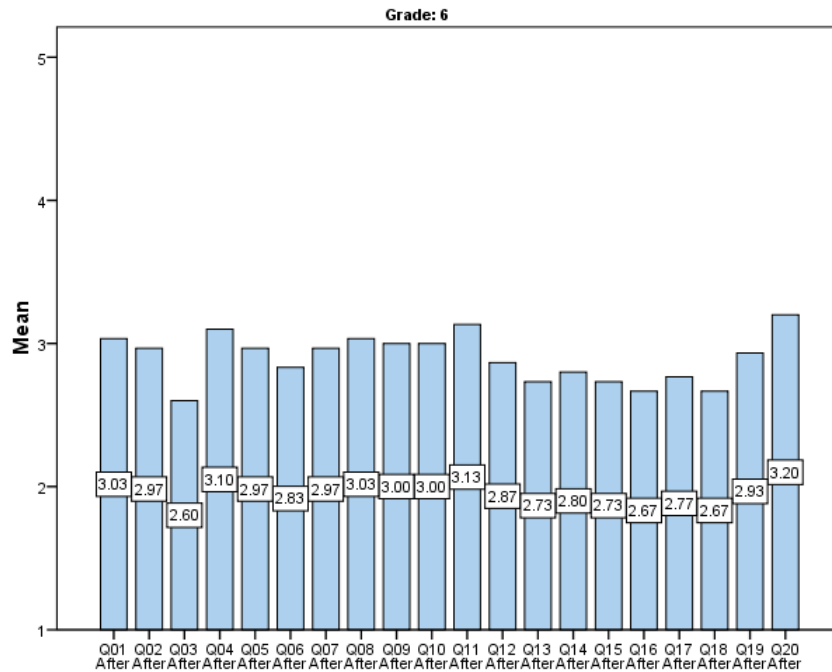


Figure 5.19 'a': The means of Grade 6 responses to the learning strategies questionnaire after intervention

iv) *The Grade 7 report*

For Figure 5.20'b', the highest means, which was also the only 3 or 'unsure', was 3.27 for statement number 20: 'I work hard to get good grades even if I do not like the learning area'. Closest to it was 2.93 for number 11, 'When I study, I construct pictures to help me understand and remember.' The lowest was 2.47 for number 16, "When I begin to study, I try to determine what I need to learn and what to do to learn". All the means reflected the 'untrue of me' responses, except number 20.

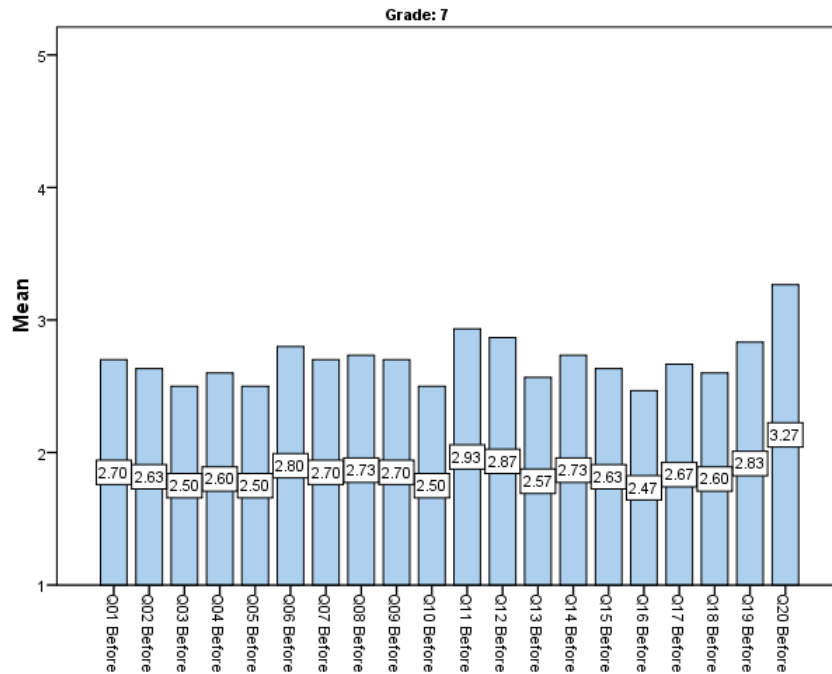


Figure 5.20 'b' or 'before': The means of Grade 7 responses to the learning strategies questionnaire before intervention

After intervention, all the means in Figure 7.20 'a' increased to 3 and slightly above, meaning more and more participants responded with 'unsure' to all strategy-use statements with the exception of the means for number 18 (2.97). The inclination of these learners to daydream seems pervasive.

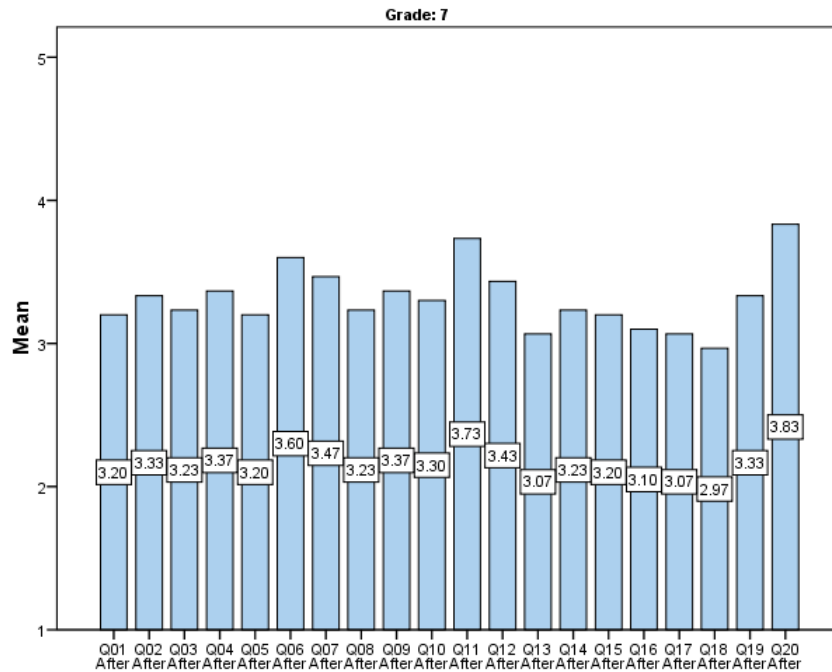


Figure 5.20 ‘a’ or ‘after’: The means of Grade 7 responses to MLSQ items after intervention

The general trend was that the means for all the grades were less than 3 (mostly the “untrue” categories) before intervention, and in some cases moved to over 3 after intervention. The means scores were higher for Grades 6 and 7, and higher after intervention. The highest means were for questions 20 (3.83), 11 (3.73) and 6 (3.60) for Grade 7 post-intervention response.

v) *Descriptive statistics for the Control and Experimental groups*

The analysis of the scores of MLSQ learning strategy items are summarised in the descriptive statistics shown in Table 5.7.

Group	Strategy before		Strategy after		Strategy difference	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Control	37.70	3.466	38.17	3.524	0.47	.681
Grade 4	33.53	5.117	37.60	5.042	4.07	3.796
Grade 5	34.20	4.752	38.77	5.270	4.57	3.481
Grade 6	34.27	4.370	40.20	5.391	5.93	2.288
Grade 7	36.30	4.764	43.43	5.829	7.13	2.224

Table 5.7: MLSQ mean scores and standard deviations of the control and experimental groups, and the differences thereof ‘before’ and ‘after’ intervention

Table 5.7 displays the means values ‘before’ and ‘after’ intervention for the one control and four experimental groups, the means differences between the two means as well as the standard deviations. The table shows that the ‘before’ means of the Control group were substantially higher than the means of Grades 4, 5 and 6. The ‘after’ means of the Control group increased slightly and was still higher than the means of the increased Grades 4 means.

While the means of Grade 5 had also increased slightly above that of the control group, it was still lower than the Grade 6-means, which in turn was lower than the Grade 7-means. The improvements in the means after the intervention were much higher in the case of all the grades compared to the increase of only 0.47 in the means of the control group. This indicates that the intervention had a definite effect of improving the learning strategies, especially in the higher grades where the means of differences were much higher.

c) The reliability analysis

In chapter 4, *reliability* was defined as the extent to which a measuring instrument yields consistent results when the entity being measured remains under similar conditions (Collins, *et al.* 2000:191). The Cronbach Alpha was used to assess the reliability of the learners' responses to the Motivated Learning Strategies Questionnaire (MLSQ) in the pre-tests and post-tests (Table 5.8 'b' and 5.8 'a'). Reliable scores should have an Alpha value of 0.8 and more to be regarded as good, and between 0.6 and 0.8 to be acceptable.

i) Before the intervention

MLSQ Strategy Reliability Statistics

Cronbach's Alpha	No. of items
0.936	20

Table 5.8 'b': Learning strategies' score reliability 'before'

ii) After the intervention

MLSQ Strategy Reliability Statistics

Cronbach's Alpha	No. of items
0.940	20

Table 5.8 'a': Learning strategies' score reliability 'after'

The Alpha values before and after intervention are high enough for the responses to be regarded as reliable. Because of the high Alpha values, combining the scores into an index was justified. An index called "Learning Strategy Index" was computed for each respondent before and after the intervention as the sum of the 20 scores. The maximum possible score was thus 100 if a learner scored 5 for each question.

d) Inferential statistics

In order to compare paired and multiple means, the t-test and the analysis of variance was performed.

i) Paired sample statistics (t-test)

The t-test is the statistical test of significance used for the testing of the hypothesis of one or two-group sample means. Table 5.9 presents the paired sample t-sets used to compare the means scores of the responses to the MLSQ items after and before intervention. The critical level of significance was set at 0.05, which means a P-value of less than 0.05 will indicate that the means are significantly different at the 5% level.

Grade		t	df	P-value
4	Learning strategy (After) – Learning strategy (Before)	4.976	29	.000
5	Learning strategy (After) – Learning strategy (Before)	7.780	29	.000
6	Learning strategy (After) – Learning strategy (Before)	6.229	29	.000
7	Learning strategy (After) – Learning strategy (Before)	14.968	29	.000

Table 5.9: T-test/paired comparison of ‘before’ and ‘after’ learning strategies means scores

The P-values are all less than 0.05, therefore the difference in the use of strategies (‘After’ intervention – ‘Before’ intervention) was significant for the experimental groups of all grades. The null hypothesis (**H₀₅**: Strategy-training does not improve learners’ knowledge and use of learning strategies) can be rejected.

ii) Analysis of variance (ANOVA)

In order to compare the grades with respect to the 'before' scores, the 'after' scores and the improvements, one-way analysis of variance (ANOVA) tests were performed to show the differences. The results are presented in Table 5.10.

		Sum of squares	df	Mean square	F	P
Strategy Before	Between groups	363.267	4	90.817	4.427	.002
	Within groups	2974.733	145	20.515		
	Total	3338.000	149			
Strategy After	Between groups	653.933	4	163.483	6.354	.000
	Within groups	3730.900	145	25.730		
	Total	4384.833	149			
Difference (after- before)	Between groups	762.800	4	190.700	25.650	.000
	Within groups	1078.033	145	7.435		
	Total	1840.833	149			

Table 5.10: ANOVA/F-tests of means differences between and within groups before and after intervention

All the cases reveal significant differences in their means with the P-values that are less than 0.05, which indicates that the 'before' and the 'after' means scores and the improvements of the four groups are significantly different.

The multiple comparisons explore the differences furthering in post-hoc tests.

iii) Post-hoc tests

The multiple comparisons tests in Tables 5.11 'b', and 5.11'a' will compare the means of each group with the means of every other group including the control group. The means difference is significant at the 0.05 level if the P-value is less than 0.05.

Variable	Means difference		P
	I	J	
Strategy: before Control	Grade 4	Grade 5	4.167*
		Grade 6	3.500*
		Grade 7	3.433*
			1.000
	Grade 4	Grade 5	1.000
		Grade 6	1.000
		Grade 7	.193
	Grade 5	Grade 6	1.000
		Grade 7	.746
	Grade 6	Grade 7	.842

Table 5.11 'b': Means differences of one group between each group and all the others

In the case of the 'before'-scores, Grades 4, 5 and 6 have significantly lower means scores than the control group, which shows a larger difference than those of the grades, except for Grade 7, which has a significantly higher means than all the groups, including the control group.

Variable	I	J	Means difference (I-J)	P
Strategy: after	Control	Grade 4	.567	1.000
		Grade 5	-.600	1.000
		Grade 6	-2.033	1.000
		Grade 7	-5.267*	.001
	Grade 4	Grade 5	-1.167	1.000
		Grade 6	-2.600	.490
		Grade 7	-5.833*	.000
	Grade 5	Grade 6	-1.433	1.000
		Grade 7	-4.667*	.005
	Grade 6	Grade 7	-3.233	.147

Table 5.11 'a': Means differences of one group with all the groups after intervention

After intervention, the means of Grade 7 is significantly higher than the means of all the groups, including the control group, but not significantly higher that of Grade 6.

iv) Multiple comparisons: improvement

Table 5.12 presents the after-before mean scores comparison = difference means - between each group and every other group.

Variable	I	J	Means difference (I-J)	P
Strategy: difference (After – Before)	Control	Grade 4	-3.600*	.000
		Grade 5	-4.100*	.000
		Grade 6	-5.467*	.000
		Grade 7	-6.667*	.000
	Grade 4	Grade 5	-.500	1.000
		Grade 6	-1.867	.089
		Grade 7	-3.067*	.000
	Grade 5	Grade 6	-1.367	.542
		Grade 7	-2.567*	.004
	Grade 6	Grade 7	-1.200	.904

Table 5.12: Multiple comparisons of after-before means differences (improvements) of each group with all others

The means of the control group is significantly lower than the means of all the grades, and the means of Grades 4 and 5 are significantly lower than the means of Grade 7, as is reflected in the following bar chart portrayed in Figure 5.21.

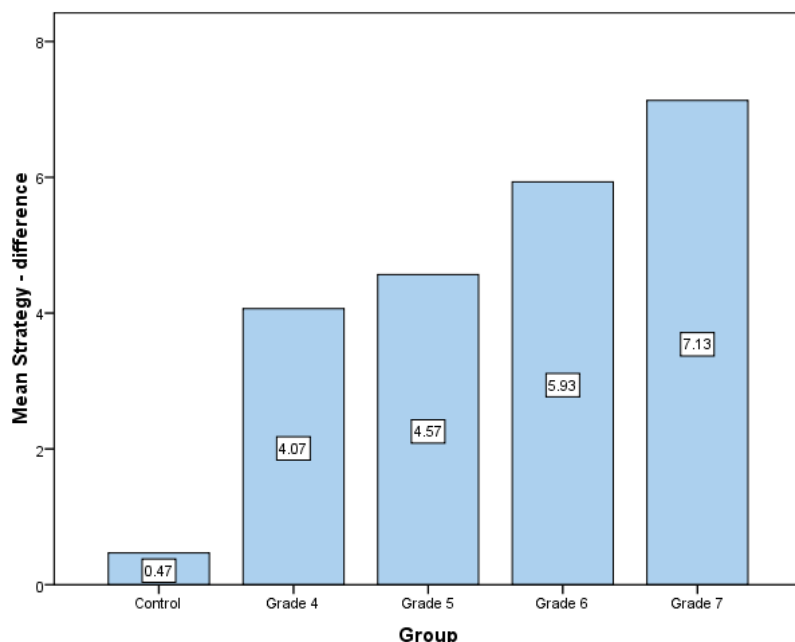


Figure 5.21: MLSQ all groups' strategy response improvement after intervention

There were gains in the strategy-use for the experimental groups, judging from the differences between their means scores after and before intervention. The increasing trend in Grade 7 is above the rest, making it the most significantly improved group of all, followed by Grades 6, 5 and 4. The means of Grade 7 differs significantly from the means of the other grades and the control group.

On the basis of the improvements that came after intervention, alternative hypothesis 5 (**Ha5**: Strategy-training improves the learners' knowledge and use of learning strategies) can be accepted, and **Ho5** (Strategy training does not improve learners' knowledge and use of learning strategies) is rejected

In the next section the impact of strategy knowledge and strategy-use on the self-efficacy beliefs of learners is explored.

5.3.3.3 Self-efficacy analysis (MLSQ self-efficacy)

a) The instrument

The analysis of the self-efficacy also required that the pre- and post-test scores means and other related descriptive and inferential statistics be calculated. The MLSQ items were evaluated on a 5-point scale as follows, namely 1: 'very untrue of me', 2: 'untrue of me', 3: 'not sure', 4: 'true', 'almost true of me', and 5: 'very true of me'.

The learners had to respond to the following statements:

22. I expect to do well in this class.

23. I know I can understand and learn the ideas and material taught in this class.

24. I can do an excellent job of problems and tasks.

25. My learning strategies are excellent.

26. Compared to others, I think I know a great deal about the learning areas in this class.

b) Descriptive statistics

In this section, the descriptive statistics were computed for all the questions in every grade.

i) Grade means of self-efficacy responses before intervention

The means of responses per statement 'before' intervention are illustrated in Figures 5.22-5.25, and Table 5.13 for all the grades.

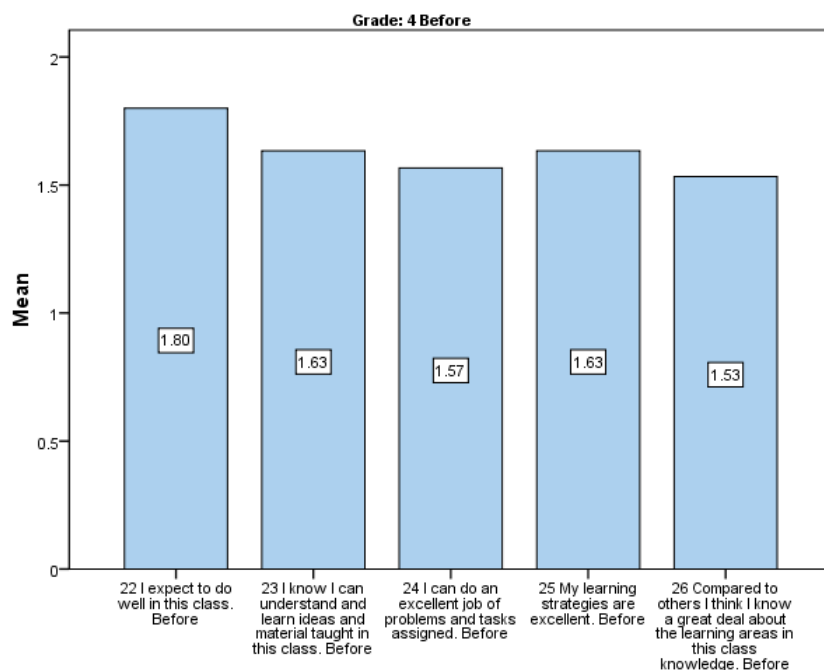


Figure 5.22'b': Grade 4 means scores of responses to each of MLSQ statements before intervention

In Grade 4 the means scores for statement 22 were slightly higher than for the other statements, but like all others it is below 3 'not sure,' which translates as 'almost good'. All the responses are between 1 and 2, or very 'untrue of me'.

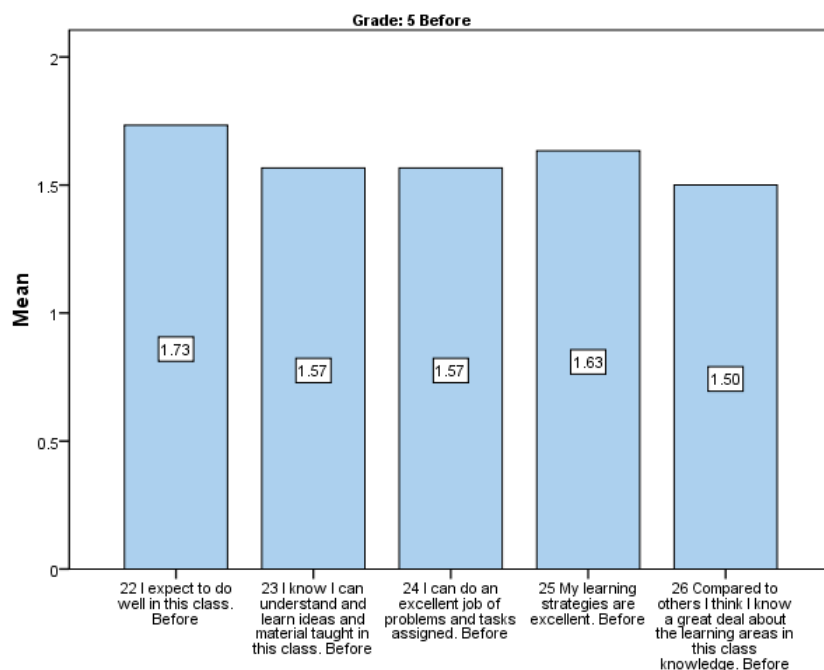


Figure 5.23'b': Grade 5 self-efficacy means scores for each statement from MLSQ

With the means score of 1.73, statement 22 was slightly higher than the other statements, but still in the 'very untrue of me' bracket.

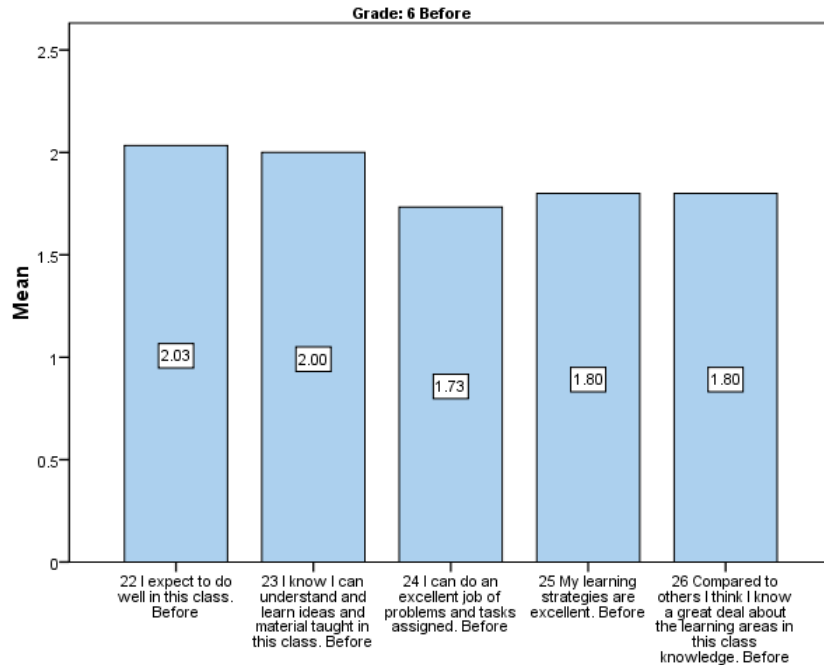


Figure 5.24'b': Grade 6 self-efficacy means scores for each statement from MLSQ

The means scores for statements 22 and 23 were slightly higher than the other statements, and they were also in a higher bracket (2 = 'untrue of me'). The other three statements scored 1, 'very untrue of me'.

The means score for statement 23 was slightly higher than the other statements, but still at 1 = 'very untrue of me'.

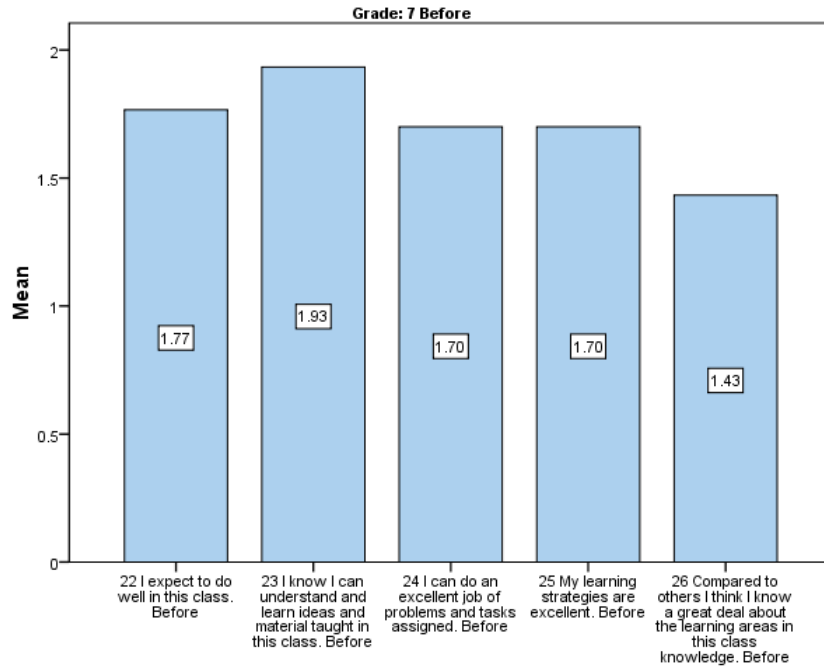


Figure 5.25'b': Grade 7 self-efficacy means scores for each statement from MLSQ

Descriptive statistics MLSQ 'before'

	N	Means	Std. deviation
4	30	1.6333	.52806
5	30	1.6000	.44567
6	30	1.8733	.56442
7	30	1.7000	.48352
Total	120	1.7017	.51204

Table 5.13 'b': All the grades means and standard deviations of responses before intervention

ii) *Descriptive statistics after the intervention*

The means scores per statement, after intervention, are illustrated in the Figures 5.26 - 5.29 and Table 5.14 below.

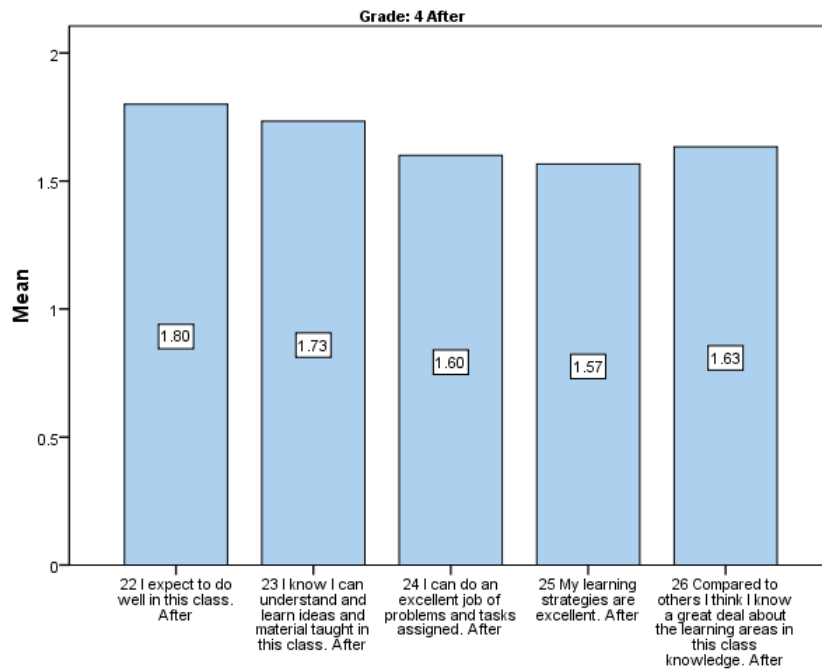


Figure 5.22'a': Grade 4 self-efficacy means scores for each statement after intervention

Although the means scores for statement 22 and 26 remained unchanged in Grade 4 after intervention, its means were still slightly higher than the rest of the statements, but like them, they were still in the number 1 bracket (very untrue of me).

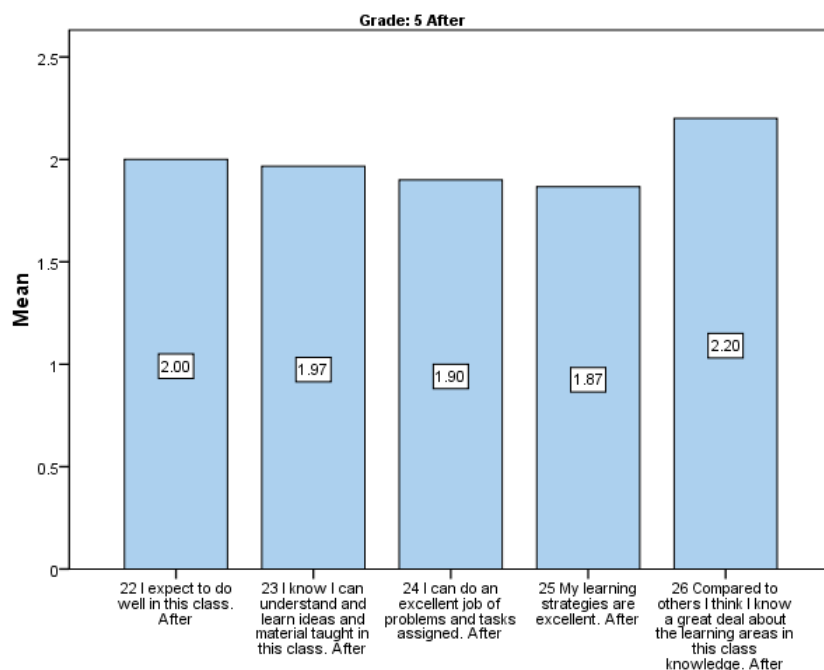


Figure 5.23'a': Grade 5 self-efficacy means scores from MLSQ after intervention

In this case the means for statement 26 were slightly higher than the other statements. Together with number 22, its scores shifted into a higher bracket (2 = 'untrue of me'), while the other scores increased within the same position as was the case before training.

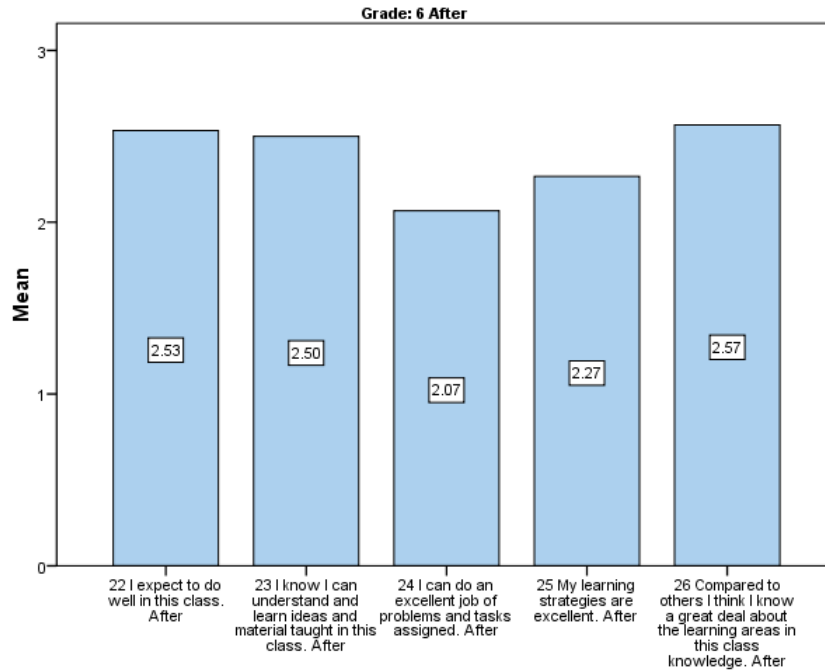


Figure 5.24'a': Grade 6 self-efficacy means scores from MLSQ after intervention

In Figure 5.28 it is indicated that all the scores have improved and all are in the 'untrue of mean' bracket after intervention.

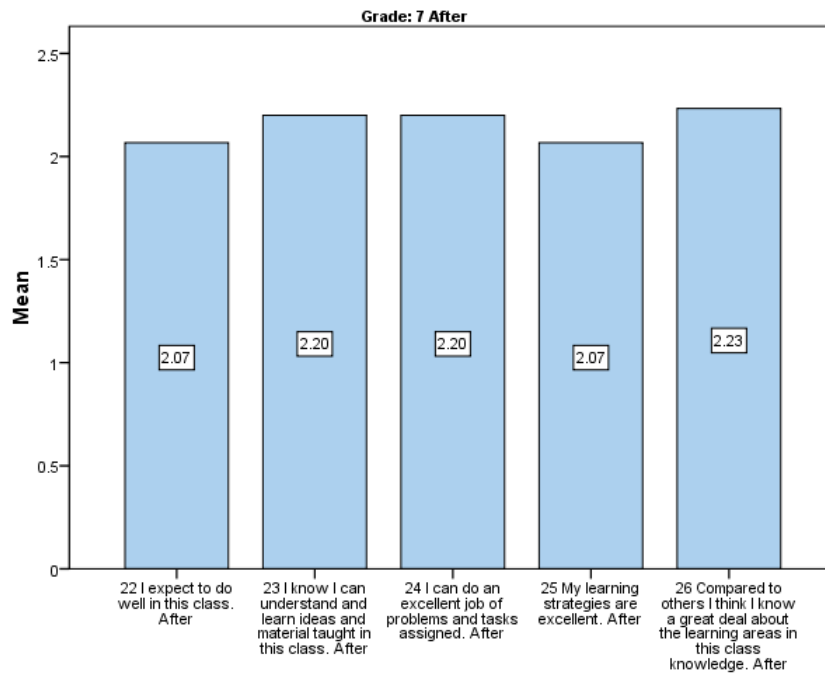


Figure 5.25'a': Grade 7 self-efficacy means scores from MLSQ after intervention

All the statement means indicate that responses to all the statements increased and shifted from number 1 into number 2. As in the case in Grade 6, the responses increased visibly, but they were still below 3.

Descriptive statistics: MLSQ – self-efficacy ‘After’

	Means	Std. deviation
4	1.6667	.57376
5	1.9867	.46068
6	2.3867	.72954
7	2.1533	.51107
Total	2.0483	.62819

Table 5.13’a’: Means and standard deviations of all grades after intervention

According to Table 5.13, the means of the higher grades are slightly above 2, while the lower grades remained at 1 after instruction in spite of the post-intervention increase in mean scores.

c) The reliability analysis

The results of the reliability obtained through the Cronbach Alpha are given in Tables 5.14 ‘a’ and ‘b’.

i) MLSQ self-efficacy reliability analysis before intervention

Cronbach's Alpha	No. of items
0.845	5

Table 5.14 ‘b’: The reliability of the MLSQ self-efficacy scores before intervention

ii) *MLSQ self-efficacy reliability analysis after intervention*

Cronbach's Alpha	No. of items
0.864	5

Table 5.14 'a': The reliability of the MLSQ self-efficacy scores after intervention

With the Cronbach's Alpha above .8, the data may be declared reliable before and after intervention, and a mean score for the five items may be computed.

d) Inferential statistics for-self-efficacy before and after intervention

Table 5.15 presents the paired samples statistics for the self-efficacy means differences per grades, followed by the computation of the t-tests in Table 5.16.

i) *Descriptive (Paired statistics)*

Grade		Means	Std. deviation
4	MLSQ After	1.6667	.57376
	MLSQ Before	1.6333	.52806
5	MLSQ After	1.9867	.46068
	MLSQ Before	1.6000	.44567
6	MLSQ After	2.3867	.72954
	MLSQ Before	1.8733	.56442
7	MLSQ After	2.1533	.51107
	MLSQ Before	1.7000	.48352

Table 5.15: The MLSQ self-efficacy means and standard deviation of all grades before and after intervention

ii) *Paired samples test (t-test)*

Grade	Paired differences		t	df	P-value
	Means	Std. deviation			
4	MLSQ After – MLSQ Before	.03333 .51215	.356	29	.724
5	MLSQ After – MLSQ Before	.38667 .35207	6.015	29	.000
6	MLSQ After – MLSQ Before	.51333 .35886	7.835	29	.000
7	MLSQ After – MLSQ Before	.45333 .39630	6.265	29	.000

Table 5.16: Grade paired sample means for ‘After’ – ‘Before’ intervention (t-tests)

With the P-value larger than 0.05 the difference in Grade 4 is not significant. Thus, the null hypothesis can be accepted, indicating that the learning strategies have not influenced the self-efficacy of learners in this grade. In the case of Grades 5, 6 and 7 the null hypothesis can be rejected because the P-values that are less than 0.05 indicate that differences between pre and post intervention scores are significant.

iii) *ANOVA*

In order to compare the grade means, ANOVA tests were performed

MLSQ ANOVA Before

	Sum of squares	df	Means square	F	P-value
Between groups	1.334	3	.445	1.728	.165
Within groups	29.865	116	.257		
Total	31.200	119			

Table 5.17 'b': Self-efficacy ANOVA before intervention

The P-value is larger than 0.05, therefore the difference of the means' 'between' and 'within' the four grades before learning strategy-training was not significant.

MLSQ ANOVA After

	Sum of squares	df	Mean square	F	P-value
Between groups	8.249	3	2.750	8.240	.000
Within groups	38.711	116	.334		
Total	46.960	119			

Table 5.17 'a': Self-efficacy ANOVA after intervention

After intervention there were significant differences of the 'between means' revealed by a P-value less than 0.05.

iv) Multiple (group) means differences

The differences in mean scores between each grade and all the others, as computed, are indicated in Table 5.19.

Bonferroni: MLSQ After

(I) Grade	(J) Grade	Means difference (I-J)	P-value
4	5	-.32000	.204
	6	-.72000*	.000
	7	-.48667*	.009
5	4	.32000	.204
	6	-.40000	.050
	7	-.16667	1.000
6	4	.72000*	.000
	5	.40000	.050
	7	.23333	.723
7	4	.48667*	.009
	5	.16667	1.000
	6	-.23333	.723

Table 5:18: Means differences and p values between groups before intervention

* The means difference is significant at the 0.05 level

The means of Grade 4 differs significantly from the means of Grades 6 and 7, but not from the Grade 5 means. The means of Grade 5 differs significantly from the means of Grade 6, which in turn differs significantly from the means of Grade 4. Grade 7 scores are lying between Grade 5 and Grade 6. The following means plot illustrates the differences between the groups.

v) Means plot

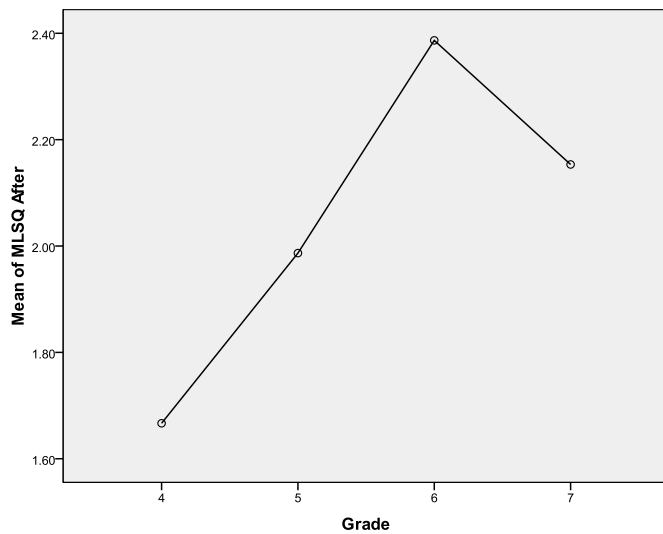


Figure 5.26 'i': Self-efficacy means plots for all grades after intervention

e) MLSQ improvement (after – before intervention)

Table 5.19 provides the descriptive statistics for the self-efficacy improvement or the difference between the means of self-efficacy of each groups 'after and 'before' self-efficacy, followed by the computation of the analysis of variance (ANOVA) in Table 5.20.

i) Descriptive statistics: MLSQ self-efficacy Improvement

	Means	Std. deviation
4	.0333	.51215
5	.3867	.35207
6	.5133	.35886
7	.4533	.39630
Total	.3467	.44588

Table 5.19: Self-efficacy improvement scores

ii) *ANOVA: Improvement: MLSQ*

	Sum of the squares	Df	Means square	F	P-value
Between groups	4.168	3	1.389	8.269	.000
Within groups	19.491	116	.168		
Total	23.659	119			

Table 5.20: ANOVA (Self-efficacy improvement scores)

The P-value of less than 0.05 makes the differences in the means improvements between the grades significant and makes the null hypothesis acceptable.

iii) *Multiple comparisons: MLSQ Improvement (Bonferroni)*

(I) Grade	(J) Grade	Means difference (I-J)	P-value
4	5	-.35333*	.007
	6	-.48000*	.000
	7	-.42000*	.001
5	4	.35333*	.007
	6	-.12667	1.000
	7	-.06667	1.000
6	4	.48000*	.000
	5	.12667	1.000
	7	.06000	1.000
7	4	.42000*	.001
	5	.06667	1.000
	6	-.06000	1.000

Table 5.21: Means difference (self-efficacy improvement) between each group and every other group

The mean difference is significant at the 0.05 level. The means improvement of Grade 4 differs significantly from the means of the other grades, but the other grades do not differ significantly from one another. The Grade 4 learners showed the least improvement after intervention.

iv) *Means plot*

The means differences for self-efficacy improvement are displayed in Figure 5.31, showing that the self-efficacy of the learners increased and that each higher group improved better than the one preceding it between Grade 4 and Grade 6.

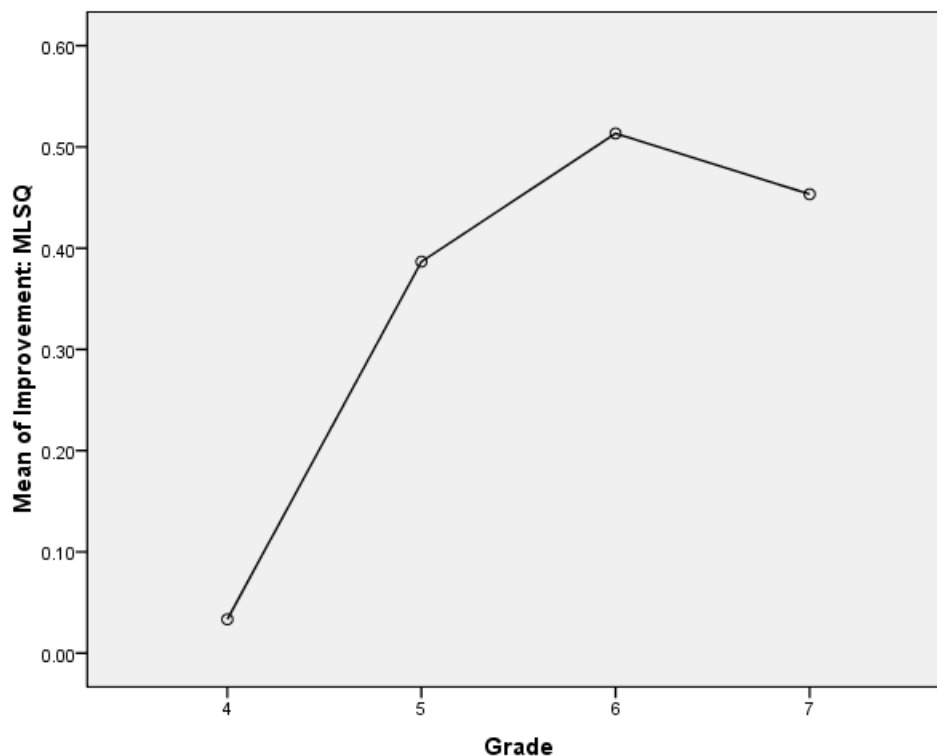


Figure 5.26'ii': Means plot (self-efficacy improvement)

However, the graph moved in a downward direction after Grade 6. The Grade 7 improvement means lie between the Grade 5 and the Grade 6 improvement means.

The conclusion reached in this section, is that after strategy instruction the self-efficacy beliefs of the learners in the experimental groups' self-efficacy perceptions improved. These results imply that the strategy training and strategy-use were effective.

The null-hypothesis (**Ho1**), suggesting that there is no relationship between the learning strategies and self-efficacy of township primary school learners is rejected. Instead, the alternative hypothesis (**Ha1**), suggesting that there is a relationship between the learning strategies and self-efficacy of township primary school learners is accepted.

5.3.3.4 Analysis of the self-efficacy data based on the CPSES

a) The instrument

From the Children's Self-Efficacy Perception Scale (CSEPS), learners also responded in pre-tests and post-tests to the self-efficacy statements as indicated below.

How well can you ...

1..... learn mathematics?

2..... learn social science?

3... learn natural science?

4..... learn English?

5.....learn your home language?

6.....finish your homework and assignments on time?

7..... prioritize study over other interesting things?

- 8.....concentrate on school subjects?
- 9.....take class notes of class instruction?
- 10.....integrate library information with class assignments?
- 11.....organize your schoolwork?
- 12.....plan your schoolwork?
- 13.....remember information presented in the class and in textbooks?
- 14.....arrange a place to study without distraction?
- 15.....motivate yourself to do schoolwork?
- 16.....participate in class discussions?
- 17.....live up to what your parents expect of you?
- 18.....live up to what your teacher expects of you?
- 19.....live up to what your peers expect of you?
- 20.....live up to what you expect of yourself?
- 21.....work in a group?

The possible replies were: 1 = "Not well at all"; 2 = "Not very well"; 3 = "Somewhat well"; 4 = "Fairly well"; and 5 = "Very well".

The null hypothesis and null hypothesis for the significance of differences between the before and after intervention mean scores as well as between experimental and control groups were as follows:

Ho1: There is no relationship between the learning strategies and self-efficacy of Black township primary school learners.

Ha1: There is a relationship between the learning strategies and self-efficacy of Black township primary school learners.

b) Descriptive statistics

The means values of each grade before intervention are displayed in Figures 5.32 to 5.35.

i) Means values of CPSES before intervention

CPSES raw data that was collected in the previous chapter was converted into mean scores and standard deviations per individual items before intervention as indicated in Tables 5.27'b' to 5.30'a' below for each grade.

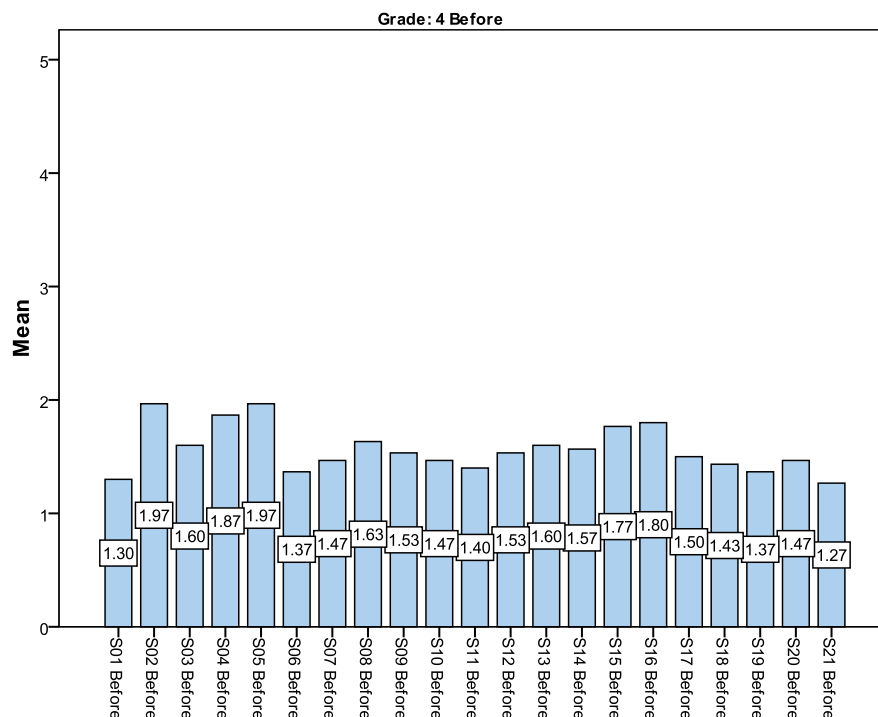


Figure 5.27'b': Grade 4 self-efficacy means of responses to individual CSEPS items before intervention

All the means in Figure 5.27'a' are between 1 and 2, which means learners were inclined to respond with 'Not well at all'. Statements 2 and 5 had the highest means (1.97) indicating that the learners feel more efficacious the social science and home language learning areas. Statement 21 obtained the lowest scores (1.27). Many Grade 4 learners find it difficult to work in groups.

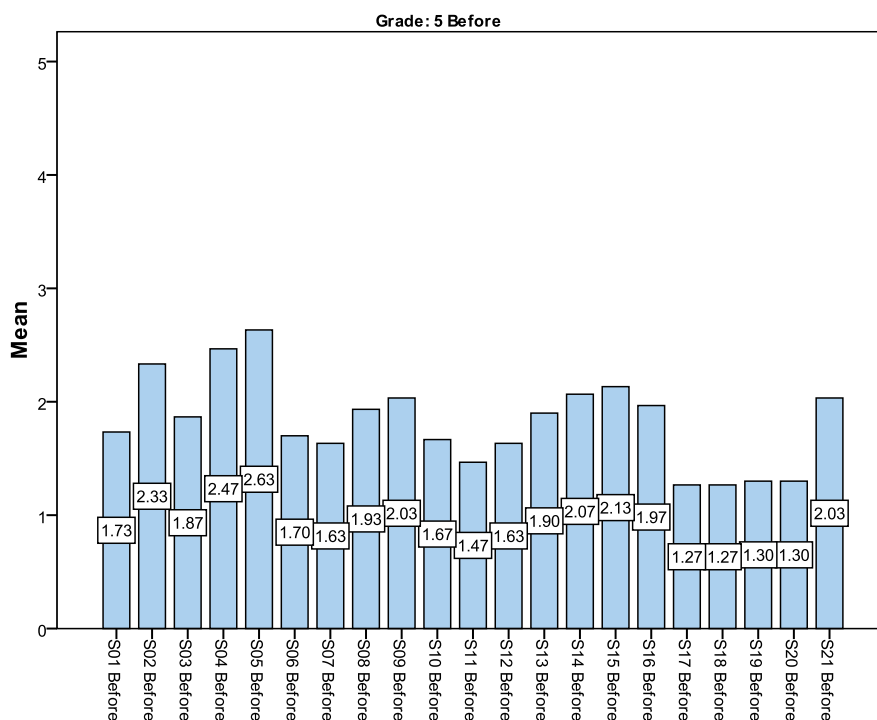


Figure 5.28'b': Means of Grade 5 responses to individual self-efficacy data before training

Statement numbers 2, 4, 5, 9, 14, 15 and 21 in Figure 5.28'b' had means higher than 2 but below 3, which translates to 'not very well', and the rest of the statements were at 1 = 'not well at all'. Statement 5 (home language) was the highest, and statements 17 (living up to parents' expectations) and 18 (living up to teachers' expectations) had the lowest means (1.27).

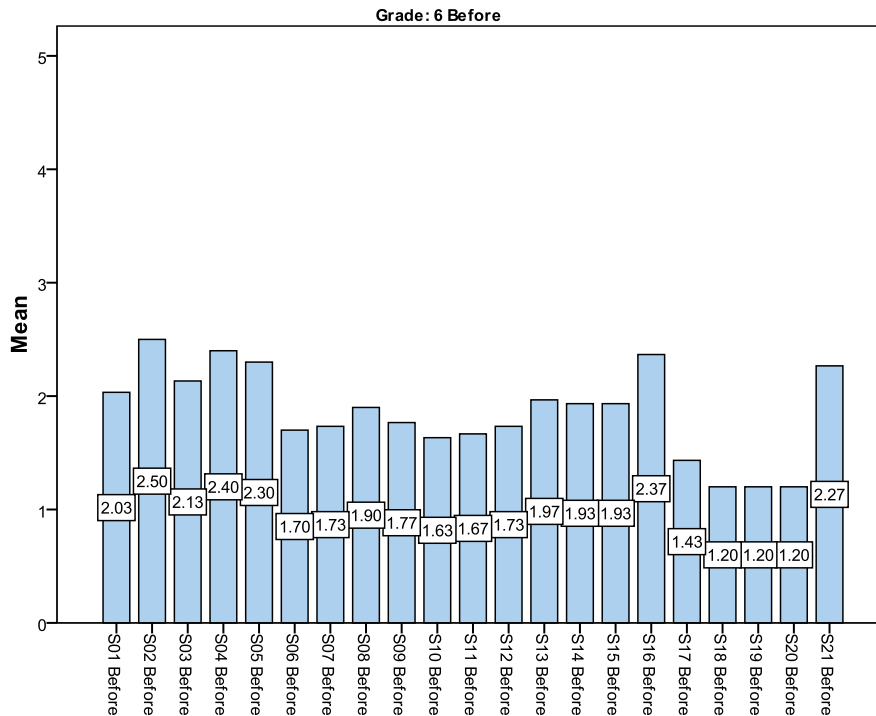


Figure 5.29'b': Means of Grade 6 responses to individual self-efficacy items before intervention

Again, in Grade 6, Figure 5.29 show that seven statements had means ratings higher than 2, with statement 2 the highest (social science 2.5). The rest of the statements were at 1. Statements 18 (living up to parents' expectations), 19 (living up to teacher's expectations) and 20 (living up to own expectations) had the lowest means (1.2). The question is whose expectations are the Grade 6 learners living up to?

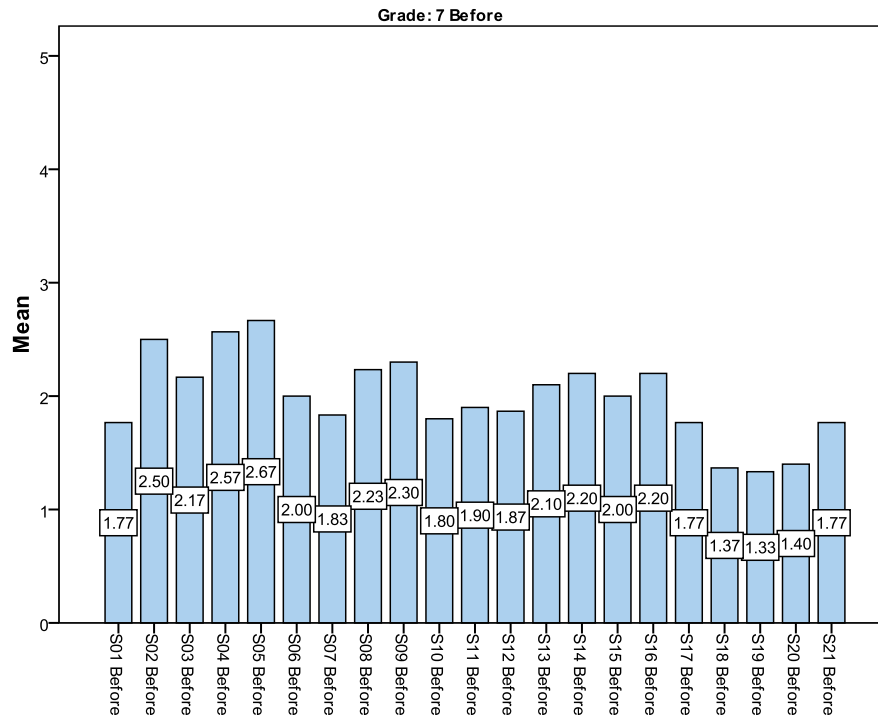


Figure 5.30'b': Means of Grade 7 self-efficacy (CEPS) data before intervention

In Grade 7 also, a quite a few statements (2, 3, 4, 5, 6, 8, 9, 13, 14, 15 and 16) had means of 2 and above but not reaching 3.00, with statement 5 (home language) the highest (2.67), while the means of the others were still at level 1. Statement 19 was the lowest (1.33).

ii) Means values after intervention

Figures 5.20'a' to 5.30'a' represent the self-efficacy means for Grades 4-7 after learning strategy training.

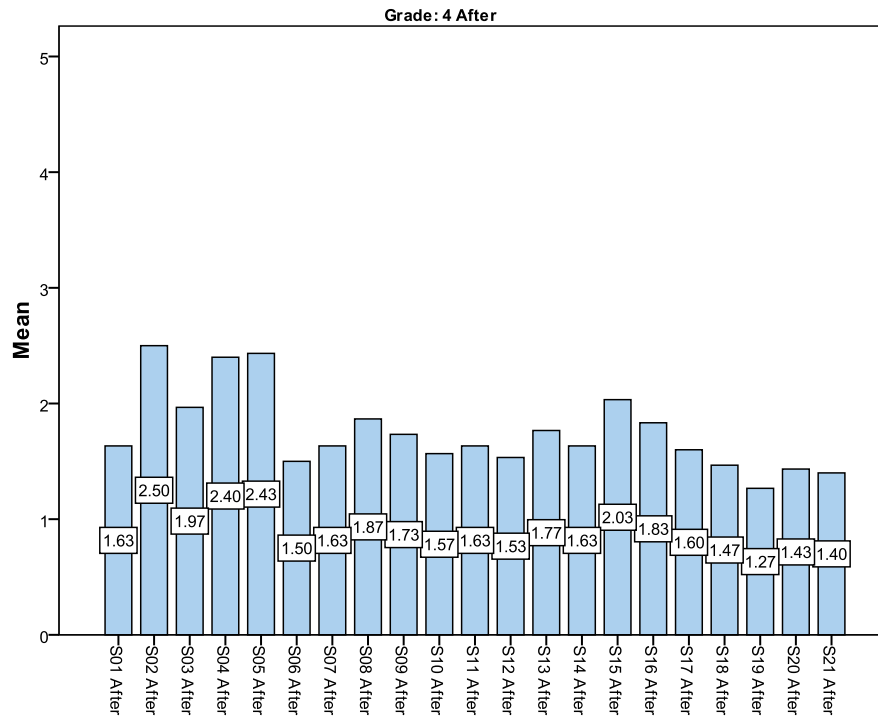


Figure 5.27'a': Grade 4 means of self-efficacy from the CSEPS data after intervention

Statements 2, 4, 5 and 15 moved above the 2.00 mark in Grade 4, with statement 2 (learning social science) obtaining the highest mean score (2.5), but basically all the responses were still in the 'not well at all' bracket, with statement 19 (living up to peers' expectations) the lowest (1.27).

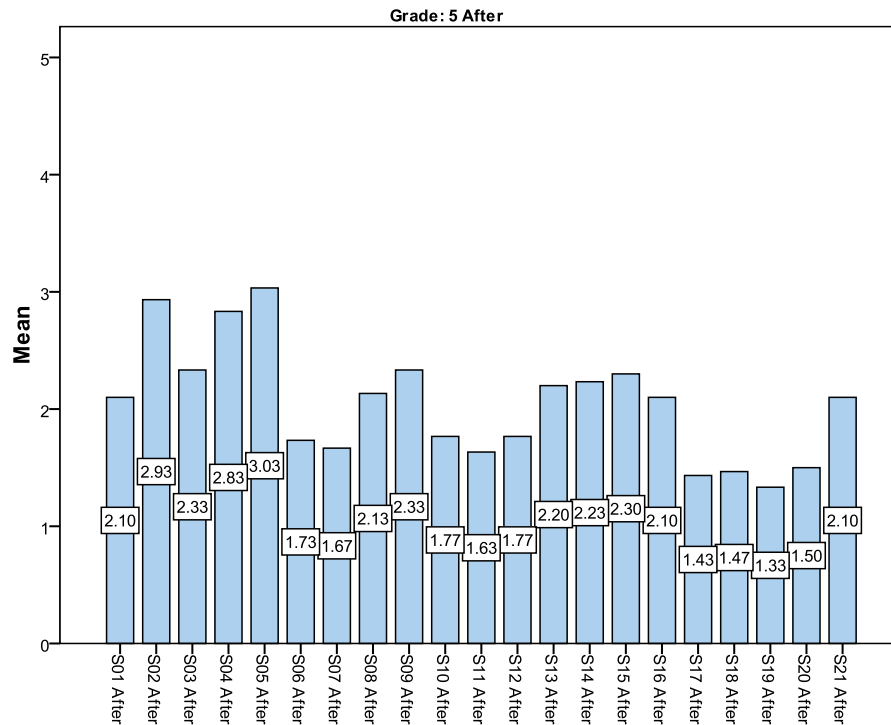


Figure5.28'a': Grade 5 means of self-efficacy data after intervention

One statement (number 5) in Figure 5.28 became highest after shifting from 2.00 to 3.03 or the 'somewhat well' rating after intervention. Eleven statements moved from 1 to 2. Only no.19 remained the lowest at 1.33.

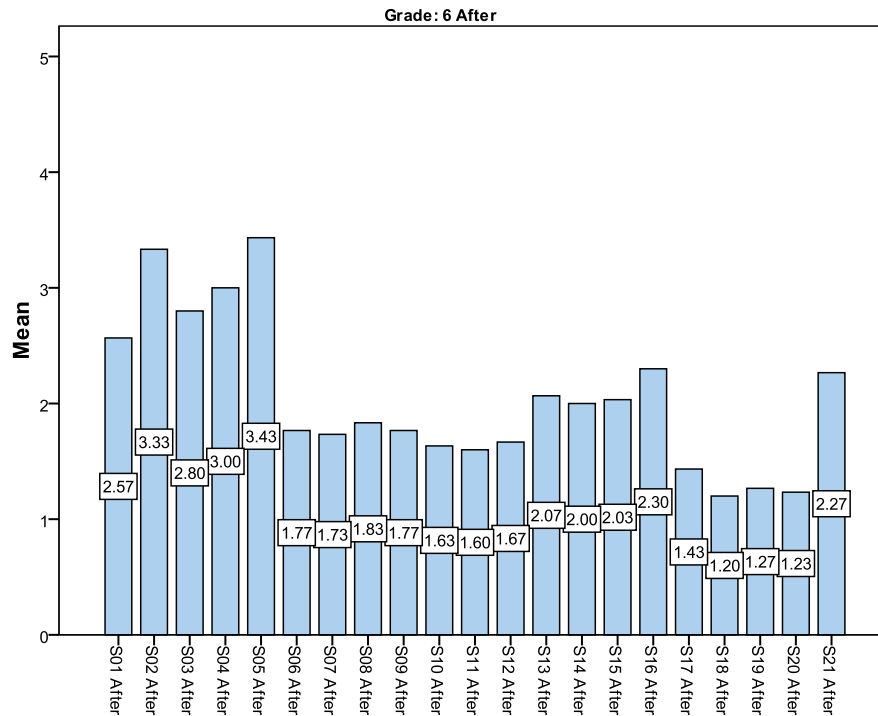


Figure 5.29'a': Means of self-efficacy data: Grade 6 after intervention

The means of three statements (2, 4 and 5) went slightly higher than 3, with statement 5 (3.43) the highest. Seven other means went up to 2, and eleven stayed at 1. Number 18 (at 1.2), was the lowest.

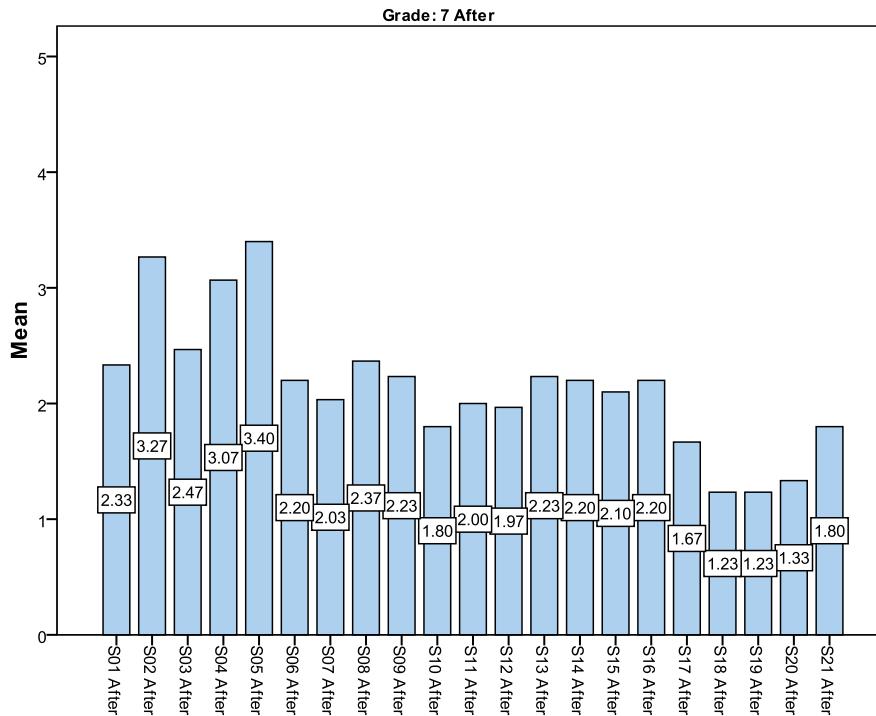


Figure 5.30'a: Means of self-efficacy data: Grade 7 after intervention

Three statements, 2, 4 and 5, had means above 3, with statement 5 the highest (3.4). Seven statements' means increased within bracket 1. The lowest means were for statements 18 and 19 (1.23).

iii) Self-efficacy means differences

The after-before intervention means differences for the CSEPS self-efficacy items will be presented in Tables 5.27'd' to 5.30'd' below.

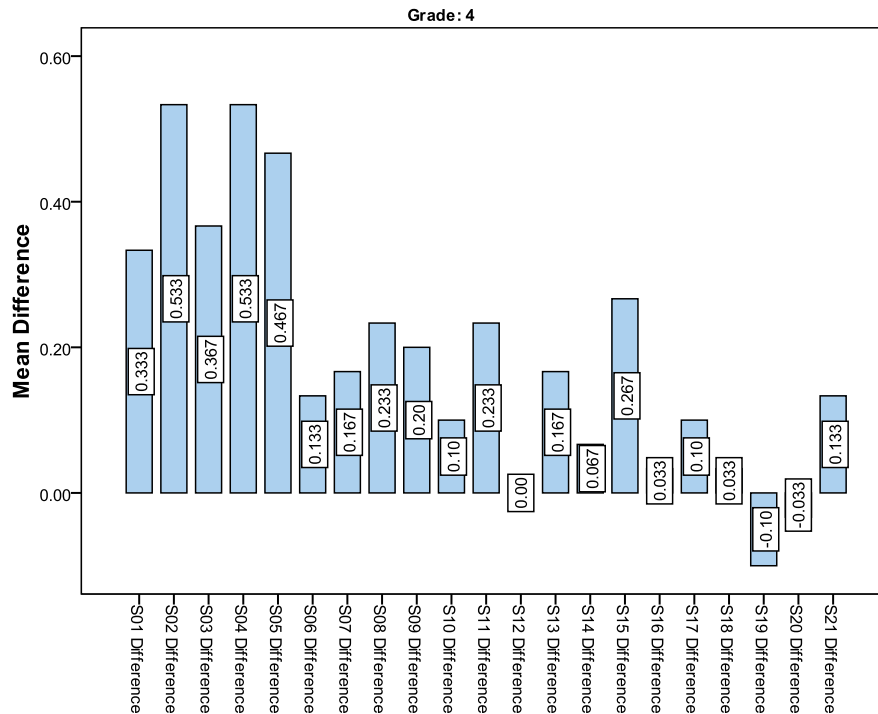


Figure 5.27'd': Grade 4 means of self-efficacy difference (improvement) per item

In Grade 4, training seems to have had the biggest impact on the responses to statements 1 to 5 and, to some extent, to statements 8, 11 and 15. For the remaining statements there was either very little or no impact at all. According to Figure 5.27, number 12 shows no difference between the responses before and responses after intervention, number 16 has a slight difference of 0.033 while 19 and 20 registered a negative diff

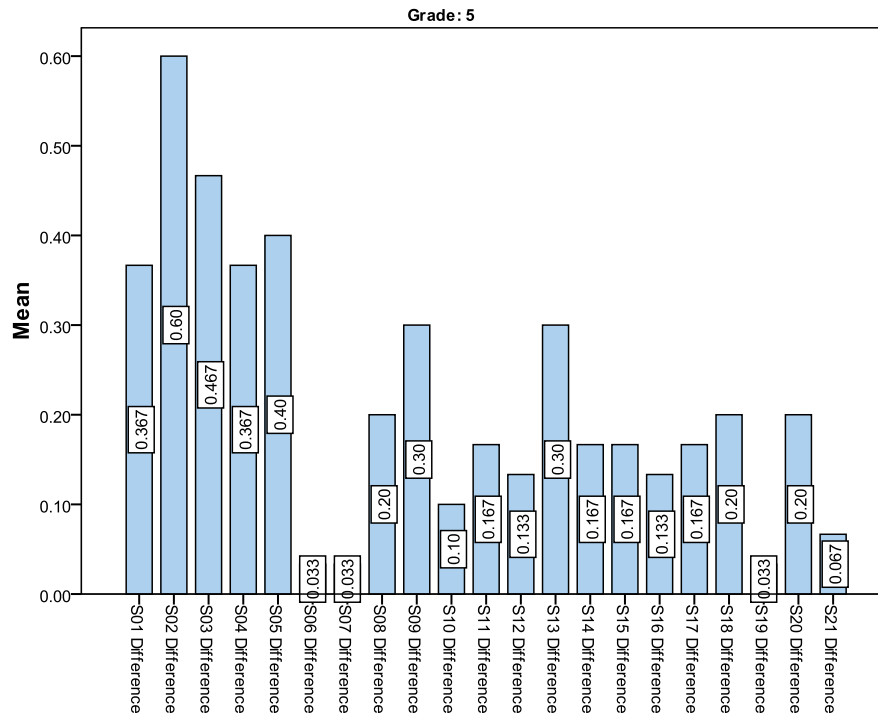


Figure 5.28'd': Grade 5 means of self-efficacy improvement per item

An improvement of .36 to .60 was seen in statements 1 to 5. Statements 9 and 13 followed with their responses increased by .30. In the remaining statements the response increase ranged between 0.033 and .20.

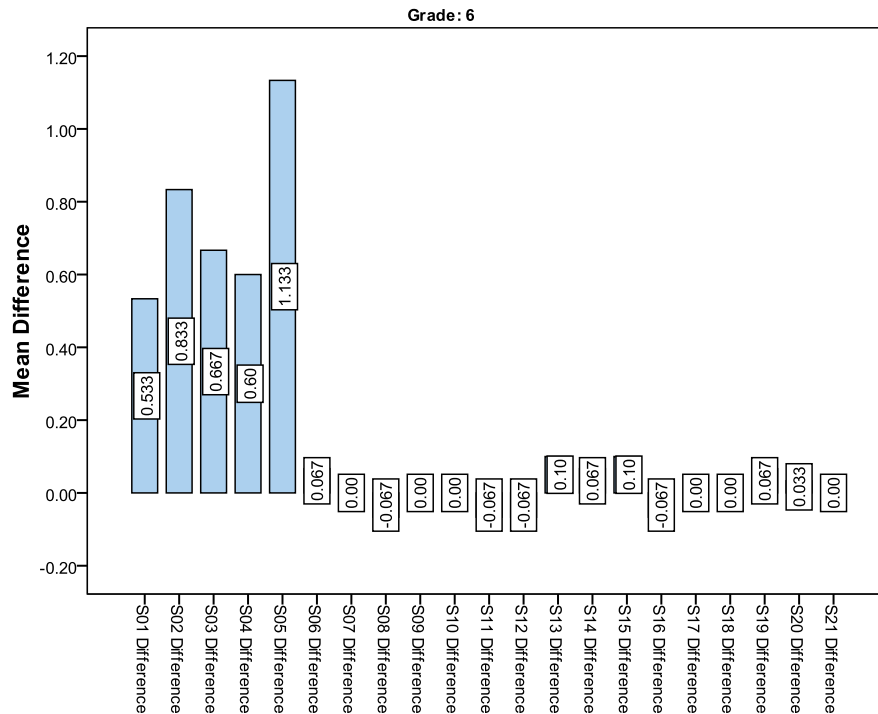


Figure 5.29'd': Grade 6 means of self-efficacy improvement per item

The intervention had an impact on statements 1 to 5 only in Grade 6. Several responses improved by a mere 0.033, 0.0167 and 0.10. Several had no gains, while others were even negatively affected.

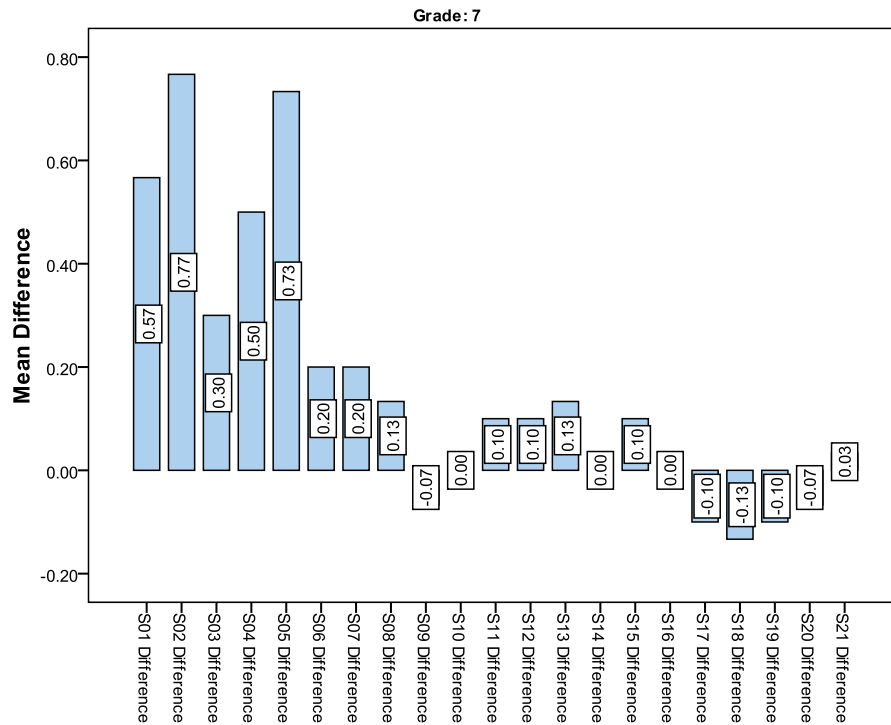


Figure 5.30'd': Grade 7 means of self-efficacy improvement

As with the other grades, the more positive responses to statements 1 to 5 were the main effects of the intervention. The increases in the other statement ranged from a mere 0.03 to 0.20. The few remaining ones were affected negatively.

The combined improvement means of Grades 4 to 7 are represented in the next bar chart (Figure 5.31).

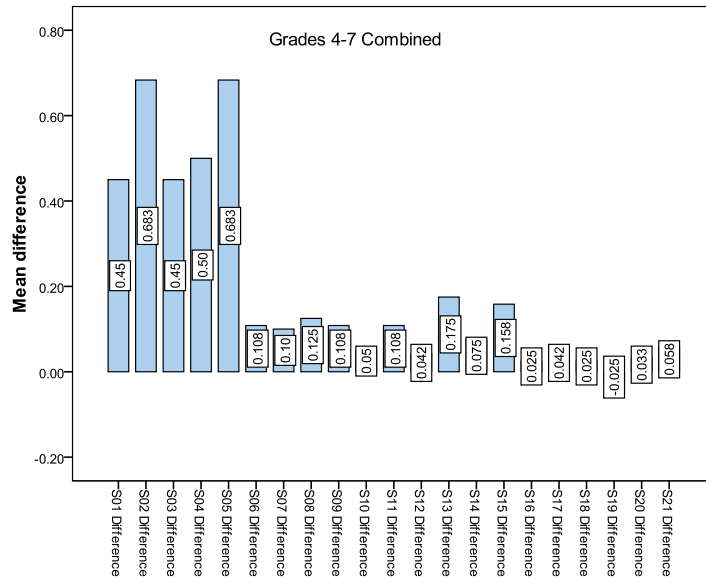


Figure 5.31: Combined Grades 4 to 7 means of self-efficacy improvement

What is presented in Figure 5.31 is a reflection of what had almost consistently been happening regarding response increase in all the grades, with apparent more responses to statements 1 to 5, many being below .20, and some even slightly negatively affected.

c) The reliability statistics

The reliability of the replies to statements 1 to 21 of the CSEPS was explored by calculating Cronbach's Alpha for the replies "before" and "after".

i) Before intervention

Reliability statistics

Cronbach's Alpha	No. of items
0.867	21

Table 5.22 'b': The reliability of self-efficacy data before intervention

The Cronbach Alpha statistics indicates that the responses to the 21 statements were consistent.

ii) *After intervention*

Reliability statistics

Cronbach's Alpha	No. of items
0.832	21

Table 5.22 'a': The reliability of self-efficacy data after intervention

The replies to the 21 statements may be deemed consistent and reliable before and after intervention. Therefore, the 21 items may be combined into one index. In this case the average of the replies to the 21 statements was computed, resulting in an index that may vary between 1 and 5, and is used for 'before', 'after' and 'differences' in the following comparisons.

d) Inferential statistics

As a starting point to the analysis of the self-efficacy data, the computation and presentation of the means and standard deviation were done in Table 5.24 and in graphs.

i) *Descriptive statistics for all groups before and after intervention*

		Mean	Std. Deviation
Self-efficacy - Before	Control	27.37	6.133
	Grade 4	29.40	6.301
	Grade 5	32.60	3.490
	Grade 6	34.57	4.703
	Grade 7	35.77	4.790
Self-efficacy - After	Control	27.27	6.085
	Grade 4	33.07	5.285
	Grade 5	36.83	4.632
	Grade 6	39.50	4.911
	Grade 7	40.23	5.008
Self-efficacy difference (After – Before)	Control	-.10	.923
	Grade 4	3.67	2.073
	Grade 5	4.23	3.711
	Grade 6	4.93	1.760
	Grade 7	4.47	3.137

Table 5.23: The ‘before’ ‘after’ groups’ means and standard deviations for and the differences

Table 5:23 shows that the scores of each grade were higher than those of the grade preceding it in both the pre-tests and the post-tests. Grade 7 had the highest and the control group the lowest scores. The largest gain was in Grade 6 (4.93), followed by Grade 5 (4.23), Grade 7 (4.47) and Grade 4 (3.67). The control group was last with -.10.

ii) *Multiple comparisons*

As part of the inferential statistics, the analysis of variance was performed so as to facilitate the comparison of the means of all the groups. The results of the Analysis of Variance tests are as displayed in Table 5.25.

iii) *ANOVA*

		Sum of squares	df	Mean square	F	P
Self-efficacy: Before	Between groups	1480.360	4	370.090	13.752	<.0001
	Within groups	3902.100	145	26.911		
	Total	5382.460	149			
Self-efficacy: After	Between groups	3414.573	4	853.643	31.474	<.0001
	Within groups	3932.767	145	27.123		
	Total	7347.340	149			
Self-efficacy Difference (After-Before)	Between groups	494.893	4	123.723	19.414	<.0001
	Within groups	924.067	145	6.373		
	Total	1418.960	149			

Table 5.24: F tests for between and within group comparisons

* The P-values are significant at 0.05

In Table 5.24, all the scores have P values less than 0.05, which means the self-efficacy means are significantly different between and within the four grades.

The differences were explored further with the help of multiple comparisons to find out how significantly each group differed from every other group.

iv) *Self-efficacy means differences before the intervention*

Variable	I	J	Mean difference (I-J)	P
Self-efficacy Before	- Control	Grade 4	-2.033	1.000
		Grade 5	-5.233*	.001
		Grade 6	-7.200*	.000
		Grade 7	-8.400*	.000
	Grade 4	Grade 5	-3.200	.182
		Grade 6	-5.167*	.002
		Grade 7	-6.367*	.000
	Grade 5	Grade 6	-1.967	1.000
		Grade 7	-3.167	.194
	Grade 6	Grade 7	-1.200	1.000

Table 5.25 'b': Means differences between each group and others before intervention

* The mean difference is significant at the 0.05 level

Tables 5.25'b' as well as the bar chart (Figure 5.32 'b') below illustrate that before the intervention, the control group had a significantly lower means score than Grades 4, 5, 6 and 7. This order of higher differences for each preceding group repeated itself with all groups.

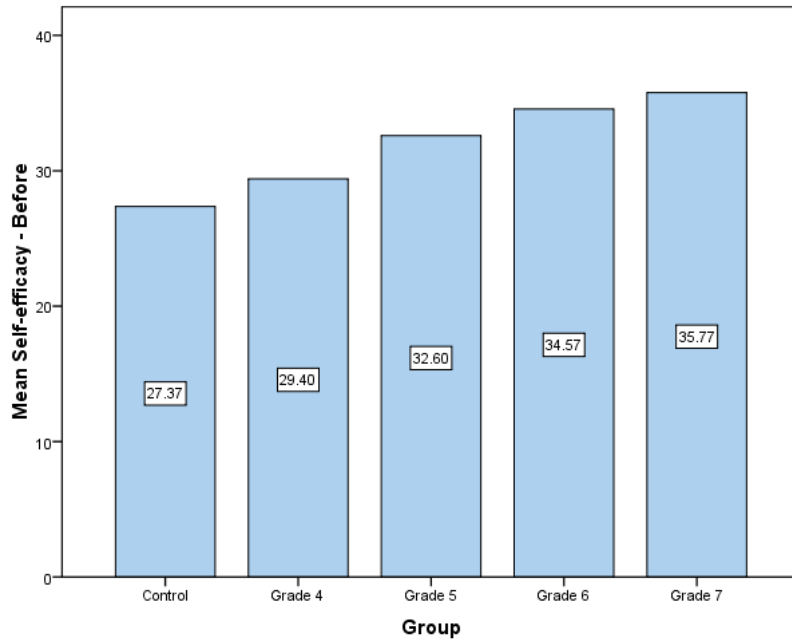


Figure 5.32 'b': Means scores per grade before intervention

According to Table 5.25 'a', the more significant means differences are the ones between the control group and all the other groups. Further significance is found in the differences between Grades 4 and 6, and Grades 4 and 7. No significance was found between the Grade 5-means and the means of all the other groups, and between the Grade 6 and Grade 7 means, where the P- values were larger than 0.05.

v) *Self-efficacy means differences after the intervention*

Variable	I	J	Means difference (I-J)	P
Self-efficacy - After	Control	Grade 4	-5.800*	.000
		Grade 5	-9.567*	.000
		Grade 6	-12.233*	.000
		Grade 7	-12.967*	.000
	Grade 4	Grade 5	-3.767	.058
		Grade 6	-6.433*	.000
		Grade 7	-7.167*	.000
	Grade 5	Grade 6	-2.667	.492
		Grade 7	-3.400	.125
	Grade 6	Grade 7	-.733	1.000

Table 5.25 'a': Means differences among the groups after the intervention

* The means difference is significant at the 0.05 level.

The pattern that emerged before intervention repeated itself in Figure 5.45 'a' and Table 2.25 'a', where the control group had a significantly lower means score than all the grades it was compared with, and each means difference with every other grade becoming progressively bigger with each higher grade it was compared with. In Table 5.25 'a' the more significant means differences were those between the control group and all the other groups, between Grades 4 and 6, and Grades 4 and 7. No significance was found between the Grade 5-means and the means of all the other groups, and between the Grades 6 and 7 means, where the P- values were larger than 0.05.

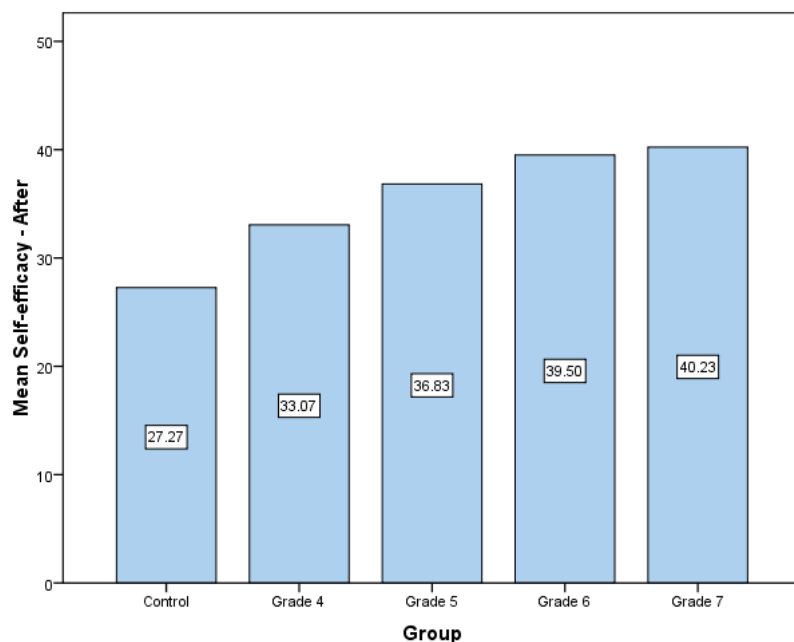


Figure 5.32 'a': Means scores of groups after intervention

v) *Self-efficacy improvement (after –before intervention)*

Variable	I	J	Means difference (I-J)	P
Self-efficacy difference	Control	Grade 4	-3.767*	.000
		Grade 5	-4.333*	.000
		Grade 6	-5.033*	.000
		Grade 7	-4.567*	.000
	Grade 4	Grade 5	-.567	1.000
		Grade 6	-1.267	.539
		Grade 7	-.800	1.000
	Grade 5	Grade 6	-.700	1.000
		Grade 7	-.233	1.000
	Grade 6	Grade 7	.467	1.000

Table 5.25'c': Multiple comparisons of means differences after-before

* The mean difference is significant at the 0.05 level.

Table 5.25'd' indicated that the differences between the means of the control group and those of all the other grades are significant because of P-values that are less than **0.05**. All the other differences have P-values of 1.000, except the means difference between Grades 4 and 6 (.539), which are more than 0.005 and not significant.

Figure 5.32'd' displays the means differences of all the grades.

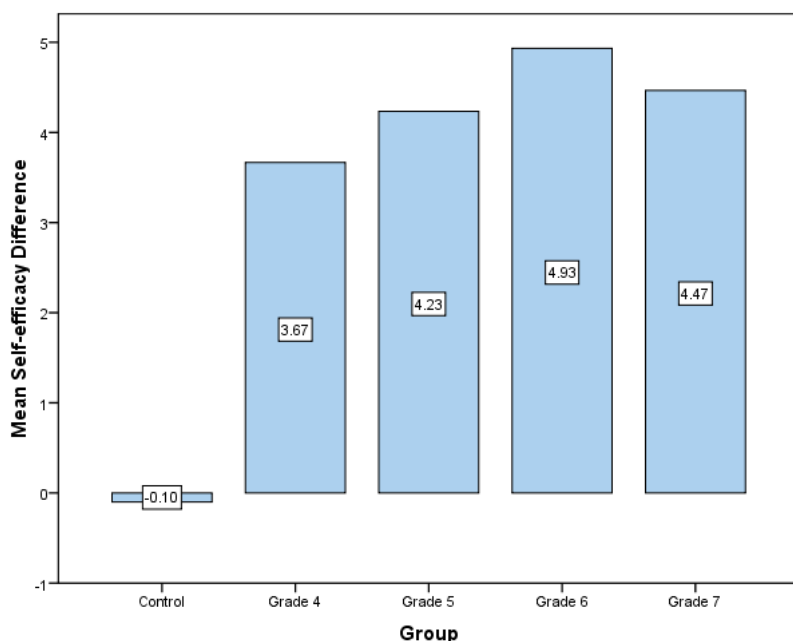


Figure 5.32'd': Differences in means per group after intervention

The order that was seen in the 'before' and 'after' self-efficacy-comparisons, where the means differences became larger with each successive group, is upsetting in the higher grades, as Grade 6 displays a larger means value than Grade 7.

The learners' self-efficacy perception improvement presented in this report leads to the conclusion that the increase was brought about by the learners' possession and implementation of the acquired learning strategies. Thus, **Ho1**: 'There is no relationship between learning strategies and self-efficacy', can thus be rejected.

Ha1: ‘There is a relationship between the learning strategies and self-efficacy of Black township primary school learners’; can be accepted.

5.3.3.5 Learners’ performance in reading-comprehension

a) The learning strategy-use indicators

In order to process the text information, the learners were expected to demonstrate their strategy-knowledge by applying the following strategies in pre- and post-instruction tests:

1. A definition of the goals;
2. Plans to attain the goals;
3. Identifying the main ideas;
4. Summarising;
5. Rehearsing;
6. Classifying;
7. Monitoring and regulating through
 - self-questioning
 - re-reading
 - help-seeking;
8. The use of structural/pictures spatial-verbal displays for text information-substitution;
9. Contextual questions; and
10. Text content questions.

The learners were scored out of 100 marks or 100%.

The Grade 4 to 6 learners’ responses were rated at the scale of 1-4:v 1=1- 34%/ Not achieved, 2=35-49%/ partially achieved, 3=50-69%/achieved and 4= 70-1% or outstanding.

The response format for Grade is 1-7: 1= 1- 29%, 2=30-39, 3= 40-49, 4=50-59, 5=60-69, 6= 70-79 and 7= 80-100.

The null hypothesis (**H01**) and alternative hypotheses **Ha1** were as follows:

H05: Strategy-training does not improve learners' knowledge and use of learning strategies.

Ha5: Strategy-training improves learners' knowledge and use of learning strategies.

H03: There is no relationship between the learning strategies and the academic achievement of learners in Black township primary schools.

Ha3: There is a relationship between the learning strategies and the academic achievement of learners in Black township primary schools.

b) Descriptive statistics

As in all other instruments used in this study, the means scores of before- and after-intervention scores and their differences were computed, as reflected in Table 5.27.

		Means	Std. deviation
Performance Before	- Control	44.90	6.110
	Grade 4	36.90	4.147
	Grade 5	39.37	3.528
	Grade 6	44.37	6.542
	Grade 7	45.07	7.325
Performance - After	Control	46.07	7.220
	Grade 4	41.07	4.734
	Grade 5	45.90	5.701
	Grade 6	50.10	6.875
	Grade 7	53.43	8.382
Performance difference (After – Before)	Control	1.17	2.878
	Grade 4	4.17	2.493
	Grade 5	6.53	3.481
	Grade 6	5.73	2.970
	Grade 7	8.37	3.337

Table 5.26'a-b': Means and standard deviations of learners' performance before- and after-scores and the differences

Graphically, the means scores are illustrated for the different grades before intervention, in Figures 5.33'b' – 5.36'b' as follows:

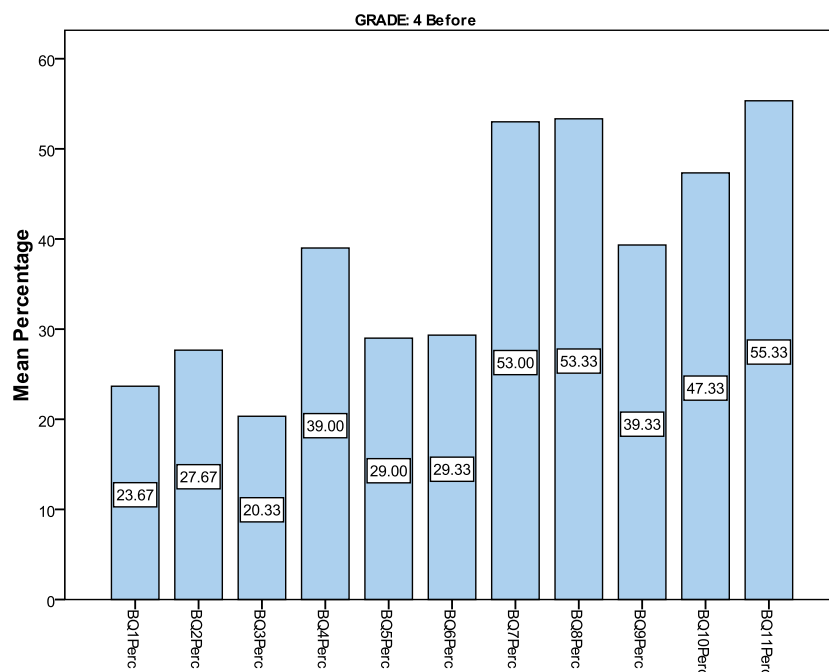


Figure 5.33'b': Grade 4 performance means per learning strategy application before intervention

Questions 1, 2, 3, 5 and 6 obtained the lowest means scores (less than 33%) were for (1 = not achieved). Questions 4, 9, and 10 scored 39%, 39% and 47% respectively, which were rated 2 or partially achieved, while question 7,8 and 11, obtained the highest responses of 53%,53.33% and 55.33% (rated 3 or achieved).

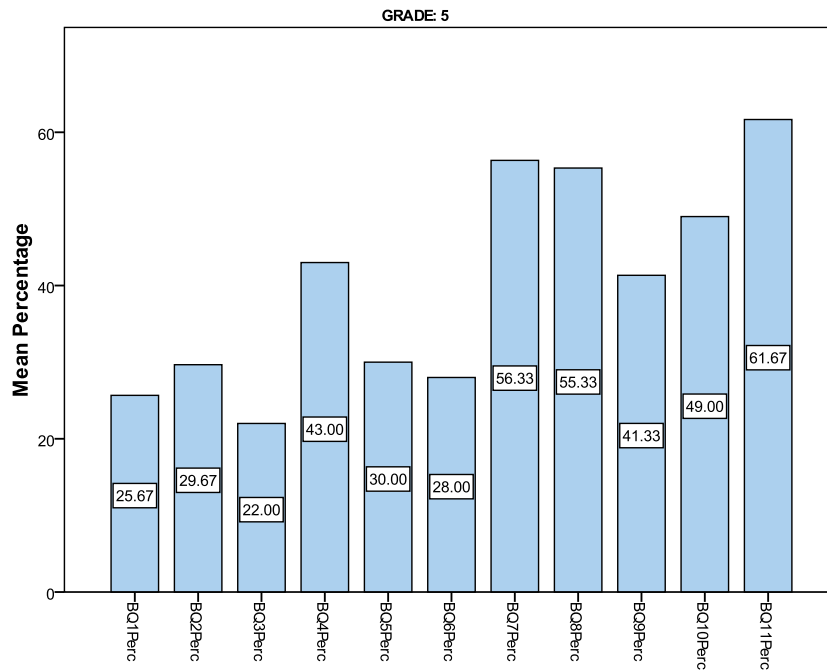


Figure 5.34'b': Grade 5 performance means per learning strategy before intervention

As in Grade 4, the lowest means scores (33% or less) in Grade 5 were obtained for questions 1, 2, 3, 5 and 6. The highest means scores (between 50% and 69%) were obtained for questions 7, 8 and 11. However, Grade 5's score-values were slightly higher than those of Grade 4.

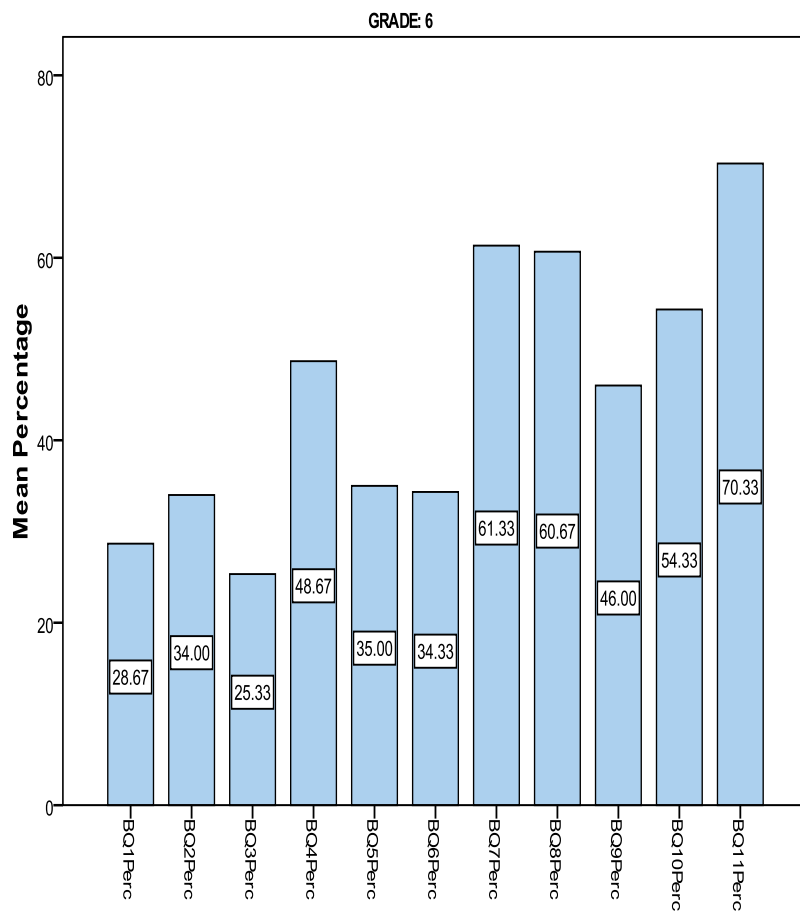


Figure 5.35'b': Grade 6 means for every learning strategy before intervention

In Grade 6 the lowest means scores of less than 33% or 1 = 'not achieved', were obtained for questions 1 and 3. The highest means scores (between 50% and 69% or 3 = 'achieved') were obtained for questions 7, 8, 10 and 11. The scores for the rest of the questions ranged between 34% and 46%, or 2 = 'partially achieved'.

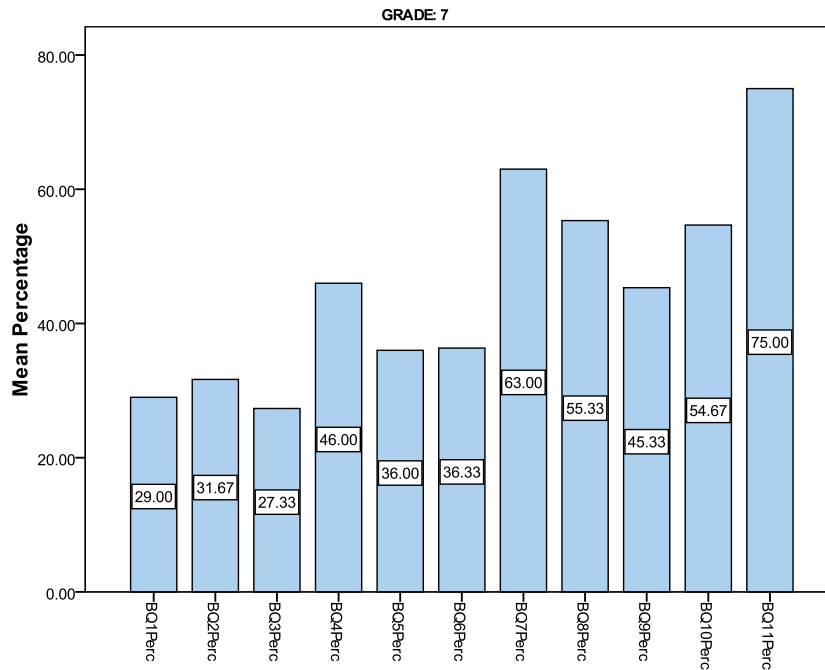


Figure 5.36'b': Grade 7 performance means for every learning strategy before intervention

Again the pattern of the previous Grade scores is repeated in Grade 7. The lowest means scores of less than 33% or 1 = 'not achieved' were obtained for questions 1 and 3. The highest means scores (between 50% and 69% or 3 = 'achieved') were obtained for questions 7, 8, 10 and 11. The scores for the rest of the questions ranged between 34% and 46% or 2 = 'partially achieved'.

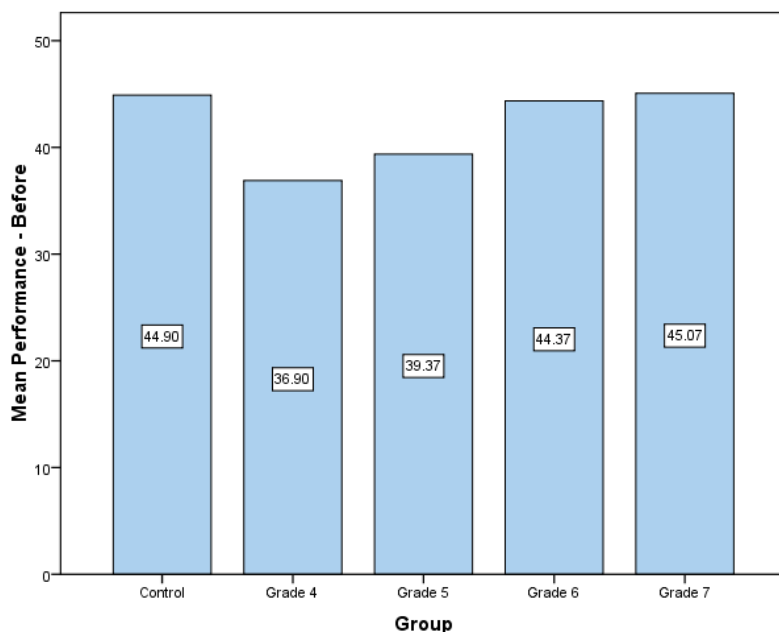


Figure 5.37 'b': The means scores of the experimental and the control group

With a score of 44.90, the means of the control group is the highest before learning strategy-training, followed, in descending order, by the means of Grades 7, 6, 5 and 4. All the groups, including the control group, fell within the 34% – 49%, or 'partially achieved'-bracket.

Following the pattern 'before', the means scores per question 'after' intervention expressed as percentages, are illustrated in the following bar charts (Figures 5.33'a' - 5.36'a').

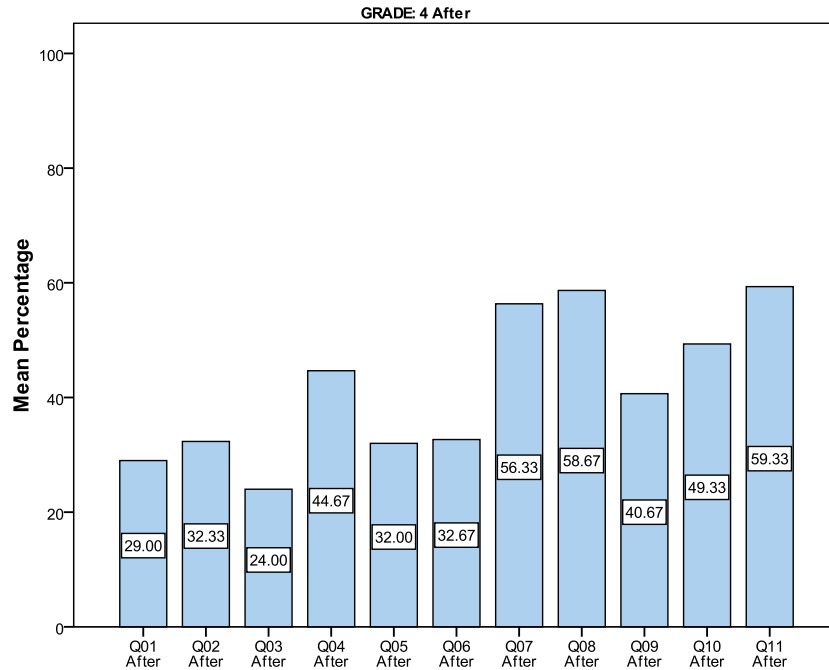


Figure 5.33 'a': Grade 4 performance: means per item after intervention

Figure 5.29'a' shows that the values of the scores have increased, compared to what they were before the learning strategy-training. However, the same questions that obtained low scores in the pre-test (1, 2, 3, 5 and 6), repeated the bad performance, with means scores less than 33% or 1= 'not achieved', and the best means scores falling between 50% and 60%, or 3 = 'achieved' repeated themselves for questions 7, 8 and 11. Once more, the remaining questions scored between 34% and 49%, which translates into 2, or 'partially achieved'.

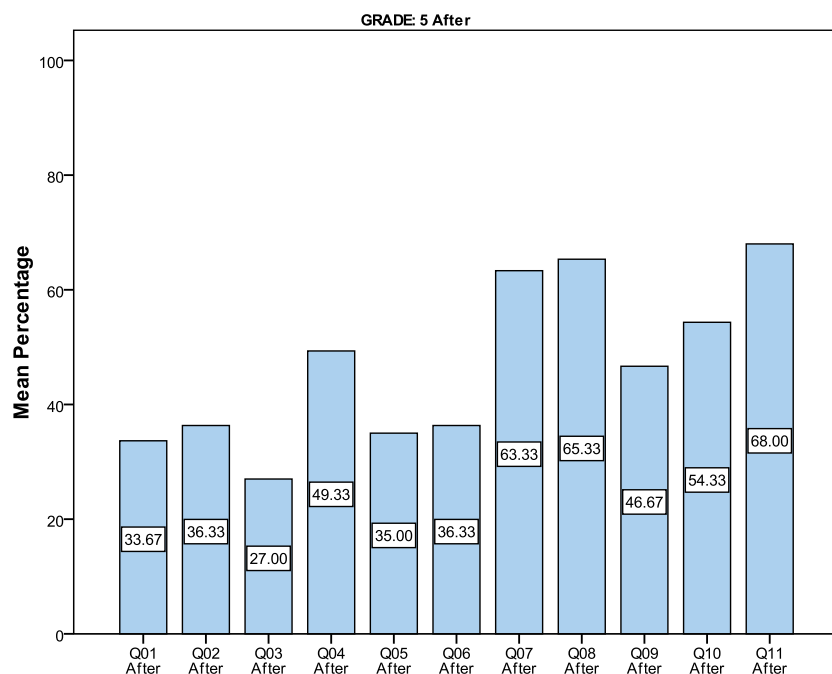


Figure 5.34 'a': Grade 5 performance: means per item after intervention

For every question in Figure 5.30 'a' the scores were more than the scores in 5.30 'b'. Question 3 elicited the worst responses, obtaining a means score below 33%, and questions 7, 8, 10 and 11 the best, with means ranging between 50% and 60%. All the other remaining six questions scored between 34% and 49%.

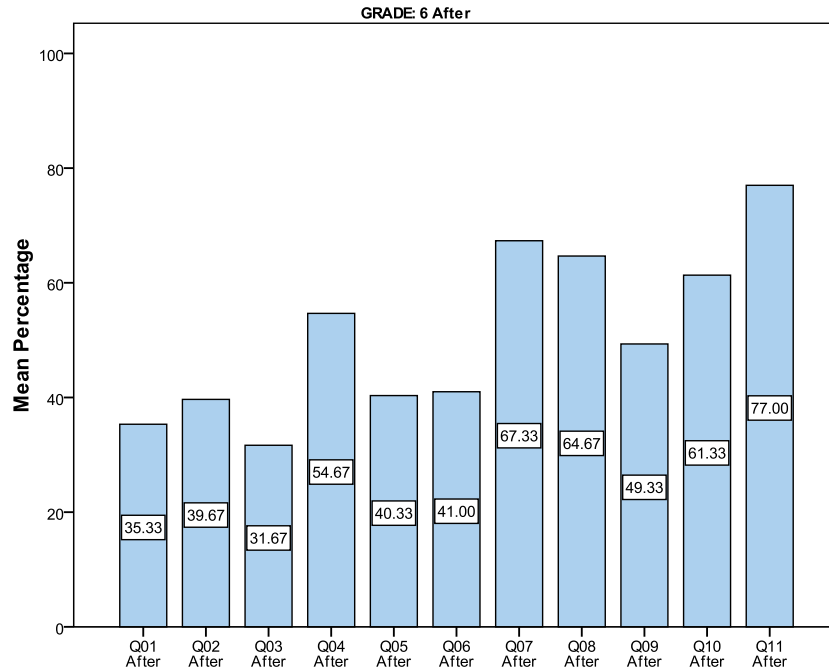


Figure 5.35 'a': Grade 6 means of performance per item after intervention

None of the questions had a means score of less than 33%. All the scores fell within the 2 and 3 brackets. The scores for six questions (1, 2, 3, 5, 6 and 9) ranged between 34% and 49%, in the 'partially achieved' bracket. Questions 4, 7, 8, 10 and 11 had means scores of between 50% and 60%, which put them in bracket 3 ('achieved').

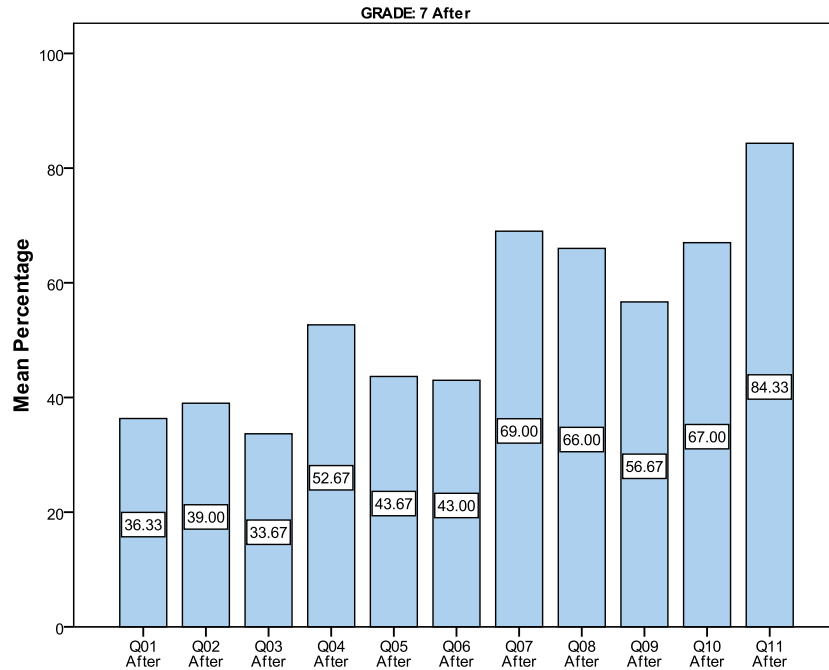


Figure 5.36 'a': Grade 7 performance: means per item after intervention

Figure 5.32 'a' shows the improvement of the Grade 7 scores presented in Figure 5.32 'b'. None of the questions had means scores of less than 33%. Questions 1, 2, 3, 5 and 6 with means ranging between 34% and 49%, moved to bracket 2 ('partially achieved'); while numbers 4, 7, 8, 9, and 10 with means scores of 50% to 69% fell within bracket 3 ('achieved'). The means scores of 84.33% puts question 11 in bracket 4 ('outstanding').

c) Multiple comparison statistics

i) The analysis of variance (ANOVA)

A one-way analysis of variance test (ANOVA) was performed, in order to test the significance of the means differences within and between the groups.

ANOVA

		Sum of squares	df	Means square	F	P
Performance Before	Between groups	1688.640	4	422.160	12.916	<.0001
	Within groups	4739.200	145	32.684		
	Total	6427.840	149			
Performance After	Between groups	2633.773	4	658.443	14.660	<.0001
	Within groups	6512.500	145	44.914		
	Total	9146.273	149			
Performance difference Before-After	Between groups	882.760	4	220.690	23.693	<.0001
	Within groups	1350.633	145	9.315		
	Total	2233.393	149			

Table 5.27 'b' and 'a': ANOVA F-tests for between and within group differences 'before' and 'after'

* The between and within group means difference is significant at the 0.05 level.

In all the cases the P-values in Figure 5.27 were less than .0001, which means that there was a significant difference amongst the groups. The multiple comparisons will be performed in the following tables.

ii) Means differences before the intervention

Variable	I	J	Means difference (I-J)	P
Performance - Before Control	Grade 4	Grade 5	8.000*	.000
		Grade 6	5.533*	.003
		Grade 7	.533	1.000
		Grade 8	-.167	1.000
	Grade 5	Grade 6	-2.467	.969
		Grade 7	-7.467*	.000
		Grade 8	-8.167*	.000
	Grade 6	Grade 7	-5.000*	.009
		Grade 8	-5.700*	.002
	Grade 7	Grade 8	-.700	1.000

Table 5.28 'b': Means difference between each groups and all other groups before intervention

* The between group mean difference is significant at the 0.05 level.

According to Figure 5.28'b', the means differences with P-values that are less than 0.05 were significant between the control group and Grade 4, the control group and Grade 5, Grade 4 and Grade 6, Grade 4 and Grade 7, Grade 5 and Grade 6, and between Grade 5 and Grade 7.

Learners from Grades 4 and 5 had lower scores than the learners from Grades 6 and 7 and the control group.

Figure 5.37 'b' shows that the mean scores of the control group are higher than the means of Grades 4, 5 and 6. Although the mean of Grade 7 is the highest, it differs from the control group's mean by a mere .17%.

iii) Means differences after the intervention

Variable	I	J	Means difference (I-J)	P
Performance - After Control	Grade 4	Grade 4	5.000*	.045
		Grade 5	.167	1.000
		Grade 6	-4.033	.211
		Grade 7	-7.367*	.000
	Grade 4	Grade 5	-4.833	.059
		Grade 6	-9.033*	.000
		Grade 7	-12.367*	.000
	Grade 5	Grade 6	-4.200	.164
		Grade 7	-7.533*	.000
	Grade 6	Grade 7	-3.333	.560

Table 5.28 'a': Group means differences between each group and every other group after intervention

The means differences with P-values that are less than 0.05 are significant between the control group and Grade 4, the control group and Grade 7, Grade 4 and Grade 6, Grade 4 and Grade 7, and between Grade 5 and Grade 7.

Figure 5.55 'a' illustrates that the control group still had a significantly higher means than Grades 4 and 5. They had a significantly lower means than Grade 7. Grade 4 had a significantly lower means than Grades 6 and 7.

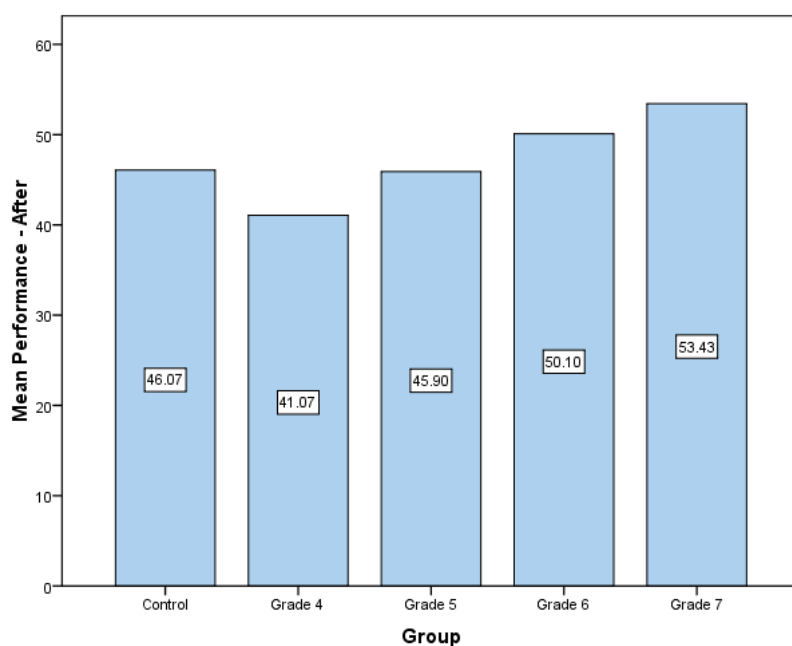


Figure 5.37 'a': Means of control and experimental groups after intervention

According to Figure 5.37 'a', all the means have increased although the increase is not much. It could be concluded that strategy training has had an influence over the outcomes of the learners' performance because the difference between the pre and the post intervention means is bigger than that of the control group, which also increased in the *post-test*. **Ho3:** there is no relationship between the learning strategies and the academic achievement of learners in township primary schools can be rejected and **Ha3:** there is a relationship between the learning strategies and the academic achievement of learners in township primary schools can be accepted.

iv) *Differences in performance (after – before intervention)*

Variable	I	J	Means difference (I-J)	P
Performance difference (After – Before)	Control	Grade 4	-3.000*	.002
		Grade 5	-5.367*	.000
		Grade 6	-4.567*	.000
		Grade 7	-7.200*	.000
	Grade 4	Grade 5	-2.367*	.031
		Grade 6	-1.567	.487
		Grade 7	-4.200*	.000
	Grade 5	Grade 6	.800	1.000
		Grade 7	-1.833	.214
	Grade 6	Grade 7	-2.633*	.011

Table 5.28'c': Means difference (performance after-before intervention)

The means difference is significant at the 0.05 level.

Figure 5.28'd' illustrates that the means difference (improvement) of the control group was significantly lower than that of all the grades. Grade 4 was also lower than Grades 5 and 7 and Grade 6 lower than Grade 7.

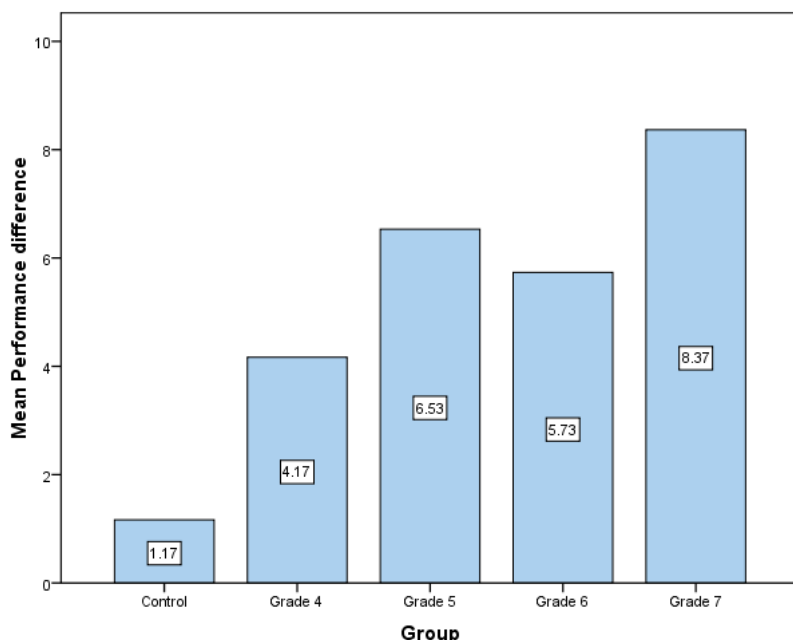


Figure 5.37'd': Group means of performance differences

All the 'after intervention' performances of the treatment groups showed some improvement on the pre-intervention performance, and their means scores were higher than the scores of the control group. Since the gain came after strategy-training and is accompanied by an almost equivalent increase in the learners' self-efficacy perceptions and raised academic performance levels. It can be attributed to the learners' newly acquired learning strategy knowledge and use, as well as to their self-efficacy perception, namely that they have the ability to learn successfully with the help of their newly-found knowledge and use of learning strategies.

Therefore, **Ho4**: 'There is no relationship among learning strategies, self-efficacy and academic achievement'; is rejected, while **Ha4**: 'There is a relationship among learning strategies, self-efficacy and academic achievement'; is accepted.

5.4 CONCLUSION

The aim of the data analysis in this chapter was to determine whether the data collected earlier would provide answers to the research questions raised regarding the

hypothesised influence of learning strategies on the self-efficacy and academic achievement of the learners in a particular primary school.

After the introduction of the chapter, the aims of the study were restated before the actual data analyses were performed and reported for each variable in both descriptive and inferential statistics using the figures and the tables. The instruments used for data collection included the SRILIS used for the structured interviews about self-regulated learning, the MLSQ used for self-efficacy and learning strategies' data, the CPSES used for the self-efficacy data, and percentages were used for the rating of the learners' class performances.

The reported improvement has rejected all the null-hypotheses and confirmed the accompanying alternative hypotheses as stated in paragraph 1.2, and reiterated in section 4.3.2. Thus, it can be concluded that in line with **Ha1**, there is a significant relationship between learning strategies and self-efficacy, **Ha2**, there is a relationship between self-efficacy and academic achievement, **Ha3**, there is a relationship between learning strategies and academic achievement, **Ha 4**, there is a significant relationship between the use of learning strategies by the learners, their self-efficacy beliefs and their raised academic performance, and **Ha5**, training the primary school learners in the use of learning strategies has had an incremental effect on their knowledge and their use of such strategies.

Although the reported gains were small, there was an indication that learning strategy-instruction can help to improve the learning and teaching culture in the school. Chapter 6 will conclude the investigation by discuss the findings, and their implications for both teaching and further research.

CHAPTER 6

FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND CLASSROOM IMPLICATIONS

6.1 OVERVIEW OF THE STUDY

A brief synopsis of the study will serve both as an introduction and a background to the findings, conclusions, recommendations and implications which are at the centre of this chapter.

6.1.1 Motivation for the study

The need to investigate the influence of the use of learning strategies by learners on their self-efficacy belief and academic achievement arose from concern about low academic attainment levels of many learners, particularly in township schools, which prevents their successful completion of Grade 12 and entry into higher education. Even more perturbing are children who have reading comprehension and other learning challenges that put them at risk of failure, dropout and unpreparedness for the workplace. The millennium challenges appeared more pronounced in the schools that predominantly cater for Black learners, than suburban independent and former model C schools where there is racial integration.

6.1.2 The problem statement

The following problem statement encapsulated the purpose of this study as the attempt to determine the significant role played by learning strategy-knowledge and strategy-use in enhancing the self-efficacy and academic achievement of learners attending a township primary school. Learners should be appropriately equipped with effective strategies and motivational self-efficacy beliefs in order to raise their academic attainment levels and become active, autonomous, accountable and self-regulated life-long learners.

6.1.3 Literature review

The preliminary literature review revealed many ways suggested by scholars as means of raising the learners' performance levels so they can keep abreast of the accelerated pace of current social and technological changes. The many suggestions included the current social and cognitive theories with their emphasis on the strategies that students can use to learn, remember, and understand their learning material. The latter theories seemed appropriate for fostering active cognitive engagement in learning that aims at higher achievement levels as well as enhanced, motivational self-efficacy beliefs.

Through the literature survey the variables and the relevant key concepts of this study were defined and elaborated upon to give provide an informed background to the empirical inquiry. Learning strategies are defined as any systematic thoughts and behaviour that are consciously invoked by learners to facilitate the processing of information. A strategic learner is portrayed as one who possesses a repertoire of effective learning strategies to plan and regulate the learning process independently and efficiently for optimal goal achievement (Lopez 2001:49; Hawley 2006:80; Weinstein & Hume 1998:120).

Academic self-efficacy is defined as one's judgment of one's own capability to perform certain behaviours successfully. Self-efficacious learners are known for their ability and motivation to take initiative, expend effort and persist even under difficult circumstances and to seek help when necessary in their academic endeavours. Learners with low sense of self-efficacy lack these actions. They tend to be at risk of entering a vicious cycle of failure self-doubt, achievement anxiety, behaviour avoidance and learned helplessness (Bong 2002:133; Jinks & Lorschach 2003:113; Pastorelli 2001:87; Scholz *et al.* 2002:242; Schunk 2003:174). Another benefit of the review of literature was the information that served to guide investigation the processes of strategy instruction.

Furthermore, enlightening information was uncovered on educational and research trends in other parts of the world as well as South Africa. The knowledge garnered in the survey of literature raised key questions pertaining to the education of today's learners

in township schools and indeed, in other schools countrywide and elsewhere in the world.

6.1.4 The research questions and hypotheses

Subsequently the research questions were formulated as follows:

- a) Is education in township schools doing enough to prepare learners to become active, autonomous, critical thinkers and problem-solvers who are life-long learners in these challenging times?
- b) What are learning strategies? What are the characteristics of a good strategy user/ and are the strategies a solution to the challenges in education today?
- c) Will explicit strategy-training increase and benefit the learners' knowledge and use of learning strategies?
- d) Is the acquisition and deliberate use of learning strategies necessary and possible for primary school learners?
- e) Do learning strategies used by learners affect their self-efficacy beliefs and their academic achievement, or do the learners' self-efficacy perception affect their learning strategies and academic achievement, or are these three factors in a reciprocal relationship, and as such, affect one another?

Based on the problem statement the following, hypotheses were formulated in section 1.6:

Ho1: There is no relationship between the learning strategies and self-efficacy of Black township primary school learners.

Ha1: There is a relationship between the learning strategies and self-efficacy of Black township primary school learners.

Ho2: There is no relationship between self-efficacy and the academic achievement of Black township primary school learners.

- Ha2:** There is a relationship between self-efficacy and academic achievement of Black township primary school learners.
- Ho3:** There is no relationship between the learning strategies and the academic achievement of learners in Black township primary schools.
- Ha3:** There is a relationship between the learning strategies and the academic achievement of learners in Black township primary schools.
- Ho4:** There is no relationship among learning strategies, self-efficacy and academic achievement.
- Ha4:** There is a mutual relationship among learning strategies, self-efficacy and academic achievement.
- Ho5:** Strategy-training does not improve learners' knowledge and use of learning strategies.
- Ha5:** Strategy-training improves learners' knowledge and use of learning strategies.

6.1.5 The method of investigation

In chapter 4 the method of investigation was described. This largely took the quantitative quasi experimental approach combined with a few qualitative action research accounts based on Zuber-Skerritt's (1993) cyclic model of action research consisting of the planning, action, observation and reflection moments (Holy *et al.* 2005:43-4 & 135).

The study was limited to a selected primary school in a township which catered for Black learners. At this site 120 Grade 4-7 learners were selected on a quota system as the experimental group and another 32 Grade 4-7 learners formed the control group based on their below average performance of between 1 and 42.

Zuber-Skerritt's four moment model was considered appropriate in view of the school's quest for improvement, although it is acknowledged that this could not be realised in only one cycle. However, time constraints made the completion of only the cycle reported on in this thesis possible. This cycle is summarised as follows.

6.1.5.1 *The planning moment*

Planning involved selecting participants, including the five member research team. It also involved the drawing up of action plans such as: communication with relevant role players, selecting instruments, as well as processes and procedures.

According to plans, the following measuring instruments were used: (a) the Motivated Learning Strategy Questionnaire (MLSQ), which assessed the cognitive, the metacognitive learning, and self-regulation strategies, as well as the self-efficacy test items, (b) the Self-regulated Learning Interview Schedule (SRLIS) for the oral evaluation of the learners' use of self-regulated learning strategies. A selection of academic-efficacy items were taken from the Children' Self-Efficacy Perception Scale (CSEPS) to test the learners' self-efficacy perceptions. (d) Questions were also asked on content material that was extracted from textbooks to assess learners' strategy application and text comprehension in the pre and *post-tests*.

The tested strategies included the following cognitive strategies: main idea extraction, summarizing, rehearsal, re-reading, self-questioning, prior knowledge activation, graphic text representation. They also used other learning support strategies in the form of metacognitive and other self-regulation strategies such as goal-setting, planning, monitoring, evaluation as well as progress and strategy feed-back.

Although the strategies were assessed individually, their results were clustered together as cognitive or metacognitive and self-regulatory strategies. Basically, the difference between pre and post, individual and inter-group responses were examined using descriptive statistics, the t-tests and Analysis of Variance (ANOVA), but the complex interrelationships were not measured.

6.1.5.2 *The action moment*

The Investigation procedure: Once plans were finalised the instruments discussed in the previous section were used to test learners in the quasi-experimental design approach of pretest – intervention – *post-test*, and a comparable control condition that only

participated in the pre and *post-tests* with the assistance of some members of research team who are also staff members at the selected primary school.

(a) The aim of the intervention programme

The intervention programme with the minimum of 10 sessions was designed with the following in mind:

- i) To encourage learners to reflect about themselves as well as evaluate their own progress and to discuss their performance in relation to the challenges placed on them by modern living that demand high standards of education and equally high standards of individual academic achievement.
- ii) To make the learners aware of the options they have and to discuss the need develop and use a repertoire of learning strategies in their different categories, namely cognitive, metacognitive and self-regulatory strategies.
- ii) To provide the learners with an opportunity to be trained in the use of learning strategies. To allow learners to practise them under the guidance of the trainer and independently so that they could internalize the newly learned strategies in an environment that also cultivates the learners' positive self-efficacy perceptions and academic success.

(b) The instructional method

The instructional method used in these sessions was eclectic, although the main ideas were derived from the models proposed by Miechenbaum and Biemiller (1998: 115 - 191), which recommend the following order:

- i) Planning: This is micro planning compared to the planning in the four major moments and was considered to be part of the action moment. This phase entails orientation and motivation that allowed learners' self-reflection and verbalization about how they deal with the task; raised their awareness of learning strategy

options and motivated them to use strategies effectively, in order to optimize their performance.

- ii) Actual instruction: At this stage, explicit strategy teaching took place in the form of modeling demonstrations, explanation, discussion and feedback.
- iii) Consolidation stage: Learners were systematically provided with guided and scaffolded practice, as well as independent practice and monitoring with appropriate feedback in order to retain and transfer the newly acquired strategies and their principles to related areas of application. This was aimed at keeping the new strategies as part of the individual's repertoire.
- iv) The consultative process: learners demonstrated their own understanding to themselves, to the other learners or to the teacher by describing the use of the newly learned strategies and justified their use of such strategies in their tasks.

6.1.5.3 The observation moment

Although observation is placed in the third phase of the 'Four moment model', it was required at all levels. However, there was more need to observe intently during the acquisition and consolidation stages of the intervention process.

6.1.5.4 The reflection moment

After the instruction sessions, the participants engaged in self-reflection thinking to evaluate the programme in relation with their understanding. Learners were also retested with the instruments that were used for the *pre-tests* using similar text and questions. The reflection moment should extend up to the time of the new cycles and the implications of this study which was limited to one cycle were considered. Hopefully reflections will serve to trigger off new and informed cycles and programmes

6.1.6 Expectations

It was expected, based on previous studies and the hypotheses stated above, that the acquisition of knowledge on the nature and use of learning strategies will mediate the process of acquiring positive self-efficacy perception and enhanced academic achievement. Therefore, once learners have increased their knowledge and use of learning strategies through training, scores with higher means and other statistical values should emerge in all variables assessed, thus confirming the effectiveness of the independent variables (learning strategies) in raising the levels of the dependent variables (self-efficacy and academic achievement) of the experimental group. Little or no increases in the scores of the control group's response were expected considering that they did not participate in the instruction programme.

It is expected that even at a primary school age, young children's skills and learning strategies that foster good comprehension when learning and those that support the learning process should make an important contribution to effective learning over and above the contribution made by word- level and other verbal skills.

Therefore, on the one hand, the study replicates the findings of previous research on strategy knowledge and strategy use as well as the effects of learning strategies on learners' self-efficacy and academic performance. On the other hand, the results of the study deepen our insights into the efficiency of strategy execution and classroom application.

6.2 PROCESSING THE RESULTS

The major moment of reflection has been part of the researcher's development since the idea of the study was conceived, becoming crucial as the reactions of the participants were observed throughout the programme and during discussions with team members. However, during the analyses of the result the reflection became more intense when the results were analysed and interpreted because the researcher and other teammates

became acutely aware of the successes and shortfall that had to form the agenda of the major planning moment for the next cycle.

6.2.1 Summary of results

a) Results before intervention

Notwithstanding the strong focus on intervention and post- test strategy data, the pre-tests showed that the learners already had some self-efficacy as well as some awareness and use of strategies for purposes of facilitating their understanding of the texts and retrieval of what was learned. However, based on the results of these pre-tests, it was evident that whatever had been done was not enough.

b) Results after intervention

In a ten week programme the learners were trained on how to use learning strategies, in order to examine the effects of those strategies to the learner' self-efficacy and academic achievement. Several key findings emerged from this study in the post - strategy intervention report

i) Increased use of learning strategies

As it was with other previous research findings, the participants in this study reported increased use of learning strategies on the MLSQ after the intervention programme. The increase in the grade means after intervention and the significant differences between the experimental groups and the control groups presented in Table 5.7 and Figure 5.21 as well as in the in the t-test (Table 5.9) show an improvement of more than 3.00, with p value below 0.05 in the Grade 4, 5, 6 and 7 experimental groups. The latter improvements are significantly more than the improvement of .47 for the control group, which had the biggest mean scores of 37.70 in the pretest.

However, contrasting the evidence of previous research on self-regulation intervention (Schunk 2003:165), the SRLIS report has revealed that self-regulated learning strategies

have not been influenced remarkably by the intervention programme. The t-test (Table 5.3) shows the Grade 4 mean difference between the pre-intervention responses and post-intervention responses as the lowest (1.986) of the four experimental groups, which are 2.063 for Grade 5, 2.875 for Grade 6 and 2.063 for Grade 7. The p-values were all below 0.05, causing **H₀₅** to be rejected. However, there was not very big difference between the control and the experimental group's means.

In answer to questions 6.1.4c, the results indicate that explicit training increased the knowledge and use of strategies of learners in the experimental group. It can also be concluded, in answer to questions 6.1.4d and 6.1.4e that strategy instruction and acquisition of strategies is not only possible, but is also crucial for all learners - even those in township primary schools. The little improvement is an indication that training can make a difference and should continue.

It can only be surmised that the difference between the MLSQ (strategies) and the SRILIS results could have been brought about by the different methods of testing.

ii) *Improved personal efficacy beliefs*

Similarly, *post-test* self-efficacy responses of the experimental group on both the MLSQ and CPSES reveal an improvement in the learners' self-efficacy perceptions; except for the control group, whose marks were lower than those of experimental groups in the CPSES and scored even lower in the *pre-test*.

Table 5.16 (MLSQ t-test) show p-values < 0.05 for all grades' self-efficacy means, except for Grade 4, whose p-value is .724 (more than 0.05) and not significant. Thus, the null hypothesis has had to be accepted in all except the latter case, meaning that the increase in learning strategies had no influence on the self-efficacy of Grade 4 learners. However, in the Grade 4 CPSES descriptive statistics show that the *pre-test* results improved by 3.7 in the *post-test*.

From the results of the CPSES, learners showed confidence for content and language (i.e. social sciences and English). The lowest scores were obtained for mathematics. Once more this is a contradiction in the outcomes of the two self-efficacy tests in Grade 4.

This latter increase of self-efficacy in the post-test came after the reported increase in strategy- use by learners, thus suggesting the strategy-training, especially the newly acquired strategy knowledge and use have had an impact on the learners' personal efficacy beliefs. The improvements give an answer to question 6.1.4e: whether the use of learning strategies does affect the learners' self- efficacy. It also confirms **(Ha1)** indicating that there is a significant relationship between learning strategies and self-efficacy.

iii) Improved learner performance

Learners show significant improvement in their post-intervention content-comprehension performance scores. Their comprehension achievement results showed a significant gain from 30% and less, to 50% and more, in all experimental conditions in most cases. Generally, higher grades scored higher than lower grades while the means of the lower grades still remained lower than that of the control group in spite of the meager gains and the benefit from instruction.

Although the outcomes are mixed, the results in Grade 6 and 7 confirm hypothesis 3 stating that: there is a significant relationship between learning strategies and the academic achievement of learners in a township primary school.

Moreover, it supports the theory that stresses the benefits of using learning strategies to promote better understanding and optimal retention and retrieval of what has been learned when such tools are used effectively. As such, it confirms hypothesis 4.

The improved post-test outcomes are also proof that strategy use is necessary and possible at the primary school. The low Grade 4 and 5 results could be attributed to their developmental level. In other words, it is another surmise that the task may have been a bit demanding for them. Even the concepts of self-efficacy and achievement may not have

been fully understood, while the language of instruction may probably have posed its own challenges at their developmental level. However, the margin by which the two grades have improved is bigger than that of the control group; Grade 5 has even surpassed Grade 6.

Without denying that there could be some direct influence of self-efficacy on the learners' performance in this study based on the view that learners need to be well motivated in order to learn and apply the newly acquired strategies, it can be inferred that the influence on performance was indirect. its increase seems to have been dependent on the increase in learning strategy-use, which in turn, was due to strategy instruction. In part, hypothesis 1 and hypotheses 2 have been confirmed.

Based on Bandura's (1986) assertion that people are disinclined to judge themselves as highly efficacious in the activities for which they have no capabilities (skills and strategies) whatsoever, it can be surmised that the enhanced achievement levels are positively linked to the learners' strategy improvement and the subsequent improvement in self-efficacy. It is a matter of integrating skill with will.

iv) The effectiveness of strategy training

There is no doubt that the intervention programme has had a positive effect directly on the learning strategies and indirectly on the self-efficacy perceptions and the academic performance.

Earlier theories are supported with regard to: (1) equipping learners with requisite learning and self-regulative-strategy knowledge through cognitive modeling, practice and feedback, enhances their positive self-efficacy perceptions; and, (2) by observing their own and other people's actual and successful use of learning strategies during instruction and practice, as well as subsequent successful performances that is attributed to strategy use, learners are apt to believe that they are capable of accomplishing similar tasks, and most likely to have raised their self-efficacy perceptions (Schunk 2003:25). On the other hand, poor performance would probably weaken learners' sense of self-efficacy

to such an extent that they can adopt self-debilitating thought patterns of helplessness and task avoidance

6.2.2 Reliability

Reflection for the researcher also meant thinking in real earnest about the reliability of different sets of response. These were assessed by calculating Cronbach Alpha over items. For most items the reliability alpha-values were good or very good (more than 0.8).

Reliability for self-regulated learning responses to 16 items of SRLIS was 0.864 before intervention and 0.733 after intervention.

On the 20-items MLSQ (learning strategies), the reliability of the responses was 0.936 before and 0.940 after intervention. The reliability of self-efficacy responses on the MLSQ was 0.00 and for the CPSE were 0.00.

6.2.3 Limitations

The findings of this study cannot be generalized to broader use because of the following reasons:

1. The participants were limited to learners in a selected primary school in a township; thus, the sample size was rendered too prohibiting to generalise the findings.
2. Results may have been compromised by language constraints. The learners are ESL speakers and thus had limited proficiency of the language used in the project, English. Hence, much time was spent on explanations and interpretations, which in itself might have compromised the results.
3. Most strategies in this study are of a general, simple to medium nature and associated with the reading text comprehension of primary school learners. No attention was given to other domains such as the mathematics curriculum.

4. The short practice sessions were not sufficient for exploring the assimilation and transfer of strategies at length in study.

6.3 IMPLICATIONS AND RECOMMENDATIONS

The findings of this research have a number of implications for both education and research.

6.3.1 Educational implications

While there is a resurgence of interest in active learning within education at the moment, its impact is relatively limited, and many teachers could be much better informed about the significance of cognitive processes for learning.

Some potential applications of the learning strategies and self-efficacy cultivation theories to teaching have been suggested. One such suggestion is that if learners are expected to execute the learning strategies effectively on their own, it is necessary for teachers to make use of extensive strategy models in the classroom as they teach effective learning strategies. The emphasis here is on similar and coping models which learners should emulate; thus, actions and thoughts should be verbalized by teachers as they work on tasks and give feedback to learners.

Given the findings of this investigation, it seems warranted to state that for learners to take responsibility for their own learning and become autodidactic and life-long learners, they should be systematically taught to use effective learning strategies.

Generally, the results also hold potential for remedial intervention on comprehension deficit.

6.3.2 Implications for research

This research has shown that learners of the primary schools selected for this study could be instructed in more explicit use of learning strategies in reading comprehension. It is argued that in similar research projects, learners in other primary schools in Black

townships and indeed in schools elsewhere in the country could benefit from such training. Such an endeavour could also be extended to curricula of other learning areas such as mathematics.

Future research (large scale and over an extended time frame) on refined instructional models and extensive practice are still needed to address a number of basic issues in this area. Such research should aim:

- To test the application of the strategies taught and to study strategy-patterns and the related self-efficacy in other learning areas. It is also necessary to continue weighing the benefits of explicit strategy training against the embedded and detached methods. The testing of strategy training under a variety of conditions would benefit the education system.
- To examine the effects of other strategy formations on the primary school learners' self-efficacy and academic performance;
- To study the complex interrelationship among the categories and repertoire of learning strategies, learners' self-efficacy beliefs and academic achievement.
- To document learner progress and success through exposure to successful models, providing motivating feedback associated with personal and/or vicarious success, as well as developing self-monitoring and self-evaluation skills.

6.4 CONCLUDING REMARKS

At the beginning of this study, the millennium needs were discussed as a starting point for the exploration of factors that would improve the educational attainment levels of learners, particularly those attending Black township primary schools.

What emerged from an overview of cognitive theories and related research was that the training of learners in the use of learning strategies does not only provide them with information processing tools that facilitate their knowledge acquisition, retention and later retrieval of the processed information, but also that the possession of such strategies by learners improves their positive sense of self-efficacy and enhances their

achievement levels. Ultimately such learners become active, independent and successful life-long learners who take charge of their own lives and learning. In contrast, learners who are not properly equipped with learning strategies tend to experience a vicious cycle of failure, under-achieving and adoption of poor self-efficacy beliefs that further lead to learned helplessness and school dropout.

The empirical investigation has confirmed the theories and previous research regarding the existing relationship among the three variables featuring in this study: learning strategies, self-efficacy and academic performance measures. In particular, the study confirmed the main hypothesis and previous research assertions that the knowledge and use of learning strategies can be improved by instruction. In turn, the increased learning strategy use led to increased learner self-efficacy perceptions and academic achievement.

In the present study, the effects of learning strategies were reflected in the generally increased mean scores of post intervention responses to the strategy, self-efficacy and academic performance questionnaires that suggested the effectiveness of strategy instruction.

The results in this study present several implications for both educational practice and research. Obviously, the combined effort of cognitive psychologists, educational practitioners and curriculum developers cannot be over-emphasized.

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APPENDIX A

P.O. Box 6594

Meyersdal,

1447

19-01-2008

DCES Policy & Planning

Gauteng Department of education

111 Commissioner Street , Room 910

Johannesburg 2000

Mr. Farista,

Re: REQUEST FOR PERMISSION TO CONDUCT RESEARCH

The above subject has reference. I am an educator at Rebone Primary School, Naledi Extension 2, currently registered with the University Of South Africa (UNISA) for a Masters Degree in the faculty of psychology of education.

Part of the requirements for my study is to conduct a research on a topic of my choice. I have decided to investigate **the influence of learning strategies on the self-efficacy perceptions and academic achievement** on learners attending a primary school in the township.

Learners aged between 10 and 14 will be invited to participate in the study after obtaining permission from their parents, whom I'll reassure about ethical issues for their children's protection.

The study will start with pre-test in the first week, for the next eight weeks the participants will be engaged in an intervention program where they'll be trained on the use of learning strategies. I believe that this study will improve the quality of learning and teaching in the selected school and to the standard of education in general. I would

therefore appreciate it if you should allow me to undertake this research in your school. I hope my request will be afforded your favourable consideration,

Yours in Tirisano,

Phyllistus Moshala Matseke

Reference No: D2011/61	
Date:	8 December 2010
Name of Researcher:	Matseke P.M.
Address of Researcher:	79 Micheal Street
	Oakdene
	Johannesburg
	1447
Telephone Number:	011 980 3712 / 071 035 4924
Fax Number:	N/A
Email address:	mokgomatsesands@mtnloaded.co.za
Research Topic:	The influence of learning Strategies on learners' academic achievement and self-efficacy.
Number and type of schools:	ONE Primary School
District/s/HO	Johannesburg Central

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

Permission has been granted to proceed with the above study subject to the conditions listed below being met, and may be withdrawn should any of these conditions be flouted:

1. The District/Head Office Senior Manager/s concerned must be presented with a copy of this letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.
2. The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.
3. A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.
4. A letter / document that outlines the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.
5. The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.
6. Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.
7. Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year.
8. Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.
9. It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.
10. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.
11. The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.
12. On completion of the study the researcher must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.
13. The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.

14. Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

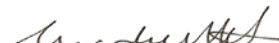
Shadrack Phele MIRMSA

[Member of the Institute of Risk Management South Africa]

CHIEF EDUCATION SPECIALIST: RESEARCH COORDINATION

The contents of this letter has been read and understood by the researcher.	
Signature of Researcher:	
Date:	

DECLARATION BY SUPERVISOR / PROMOTER / LECTURER	
I declare that:	
1. The applicant is enrolled at the institution / <u>employed by the organisation to which the undersigned is attached.</u>	
2. The questionnaires / structured interviews / tests meet the criteria of: <ul style="list-style-type: none">• Educational Accountability• Proper Research Design• Sensitivity towards Participants• Correct Content and Terminology• Acceptable Grammar• Absence of Non-essential / Superfluous items	
Surname:	<i>De Witt</i>
First Name/s:	<i>Maria W.</i>
Institution / Organisation:	<i>UNISA</i>
Faculty / Department (where relevant):	<i>Educational Psychology</i>

Telephone:	0823662540
Fax:	
E-mail:	dwittmw@unisa.ac.za
Signature:	
Date:	

N.B. This form (and all other relevant documentation where available) may be completed and forwarded electronically to who can be contacted at [011] 843 6503. The last 2 pages of this document must however contain the original signatures of both the researcher and his/her supervisor or promoter. These pages may therefore be faxed or hand delivered. Please mark for Attention: Diane Bunting [fax to e-mail 086 565 0355] or hand deliver (in sealed envelope) to her at room 509, 111 Commissioner Street, Johannesburg. All Enquiries pertaining the status of research requests can be directed to Diane Bunting.

APPENDIX B

Letters to Parents

Dear Parent,

I am a Masters' student specializing in Educational Psychology at the University of South Africa (UNISA). I wish to inform you about a research that will be conducted at your child's school on: **The influence of learning strategies on the self- efficacy and the academic strategies of primary school learners.** We hope that at the end of this study the teachers in the school will find ways of helping your child to learn successfully. The study is also part of the requirements for the completion of my degree.

10-12 weeks have been allocated as follows for this programme:

- 1st week for pre- testing
- 8 weeks for an intervention programme, in which Grade 4-7 learners will participate in learning strategies instruction sessions
- Last week for post testing

It is our duty and undertaking to ensure that no participant in the placed in any form of risk as strict confidentiality will be observed by keeping all their identity of all secret.

Kindly allow your daughter/son, _____ (Grade), to take part in this study

Your understanding and cooperation is always appreciated

Yours sincerely,

Phyllis M. Matseke

Appendix B (*continued*)

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Ps. Return this reply slip.....

I, Mr. /Mrs. / Ms..... , the parent of allow/
don't allow my son/daughter to participate in your research programme.

Signed: Date:

APPENDIX C

A letter of invitation to learners

Dear learner,

I wish to invite you to participate in the research project I am undertaking during the next ten weeks. The study is about the ‘influence of learning strategies on the self efficacy and academic achievement’ of learners in primary schools. With this study, your teachers and I hope to find ways of helping you to understand your school work better and to be successful in life.

The programme will run for the next ten week, during which:

- the first week will be allocated for pre-testing
- 8 weeks will be used to train you on the use of learning strategies.
- the last week will be allocated for pos-testing

Permission will also be sought from your parents as well.

Thank you for your willingness to participate.

P. M .Matseke

Signature.....

Please return the reply slip

I accept / don't accept the invitation to take part in the research

Name & Surname..... Signature..... Date...

Samples of scripted lessons

MAIN IDEA COMPREHENSION

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Table 1. Units of the programme used to train teachers

Unit 1. INTRODUCTION TO READING COMPREHENSION.
<ul style="list-style-type: none"> • Factors affecting comprehension.
Unit 2. PREVIOUS KNOWLEDGE.
<ul style="list-style-type: none"> • How previous knowledge affects comprehension. • Classroom strategies to activate previous knowledge.
Unit 3. INTRODUCTION TO TEXT STRUCTURE:
<ul style="list-style-type: none"> • WHAT should be taught: <p>Concept of main idea: topic + what the author says about the topic (text structure).</p> <p>Textual cues that help the reader to identify text structure.</p> <p>Types of text structure:</p> <ul style="list-style-type: none"> - <i>Collection</i>: The structure of texts written to show a list of characteristics, facts or events. - <i>Generalization</i>: The structure of texts including a definition or general statement – usually at the beginning of the text – the rest of the sentences being explanations or examples of this general statement. - <i>Classification</i>: The structure of texts in which objects, etc., are categorized by shared features. - <i>Comparison-contrast</i>: The structure of texts written to show the similarities and differences between objects, facts, features, and so on. - <i>Cause-effect</i>: The structure of texts written to show causal relationships between events. - <i>Problem-solution</i>: The structure of texts organized around a problem to which some solution is suggested. - <i>Procedural</i>: The structure of texts that show the steps necessary to achieve some goal. - <i>Argumentation</i>: The structure of texts whose author is trying to convince us of something, giving us different reasons to achieve his/her purpose. - <i>Narration</i>: The structure of texts that tell some story, with a set, main character, a goal the main character wants to reach, one or several problems the main character has to confront and solve, and a final outcome. • HOW reading comprehension should be taught: <p>The Direct Instruction Method (Baumann, 1984; Pearson and Gallagher, 1983):</p> <ul style="list-style-type: none"> - <i>Modelling the process to find a main idea</i>: previous knowledge activation, establishing hierarchical relationships among sentences, use of textual cues to identify a given text structure, monitoring the comprehension process. - <i>Direct instruction of hierarchical representation</i>: how to construct the hierarchical representation of relations among text ideas. How to identify the structure of the text. How to identify the main idea when the hierarchical representation and the structure of the text are given. - <i>Practice under instructor's supervision</i>: he or she provides guidance and feedback. - <i>Independent practice</i>.
Units 4 to 8. TRAINING HOW TO TEACH MAIN IDEA IDENTIFICATION IN TEXTS OF DIFFERENT STRUCTURES.
<ul style="list-style-type: none"> • Teacher training aimed at showing teachers how to use the Direct Instruction Method to teach: <p>How to identify, using textual signals, the different text structures described above.</p> <p>How to graphically represent the hierarchical relations between text ideas.</p> <p>How to identify the main idea in texts of different kinds.</p> <p>How to compose a text with the purpose of giving and explaining a definition.</p>
Unit 9. INTERACTION PATTERNS TO MOTIVATE CHILDREN DURING READING COMPREHENSION INSTRUCTION.
<p>problem-solution, four argumentative, four comparison-contrast. Fourteen of the 22 texts have an explicit main idea and six have an implicit main idea.</p>

An example of teacher training: modelling

The trainer introduces the task stating the purpose of the training (e.g. 'Today we are going to learn how to teach our pupils the classification structure'), its relevance for students' learning (e.g. 'Classification is a structure that appears very frequently in textbooks'), and the main idea of the kind of texts to which the session is devoted (e.g. 'The most important information that the author of this kind of text is trying to communicate is the category system itself'). After this, he (or she) gives a text to the teachers being trained. Then he or she reminds the teachers that, in order to show how they should act in their classrooms, he is going to play the role of a teacher and they have to adopt the role of their students. After this introduction, the modelling begins.

(In the following example, the sentences of the text being used are written in italics, whilst the trainer's thoughts, expressed aloud, are in roman type.)

(1) *THE MUSCULATURE.*

The musculature. . . this title. . . I think that this text is going to tell me how our body muscles are. . . or perhaps what they are useful for. . . Mm. . . Let's go on reading to test it. . .

- (2) *Our muscles have, as their main function, to impulse all the movements and displacements that man realizes to accomplish the relation function.* Mm. . . I was right. . . muscles serve to allow us to move and go from one place to another. . . but what does the expression 'function relation' mean? . . . Perhaps the text will explain it later. . . Let's go on. . .
- (3) *There are three kinds of muscles in the human body: skeletal muscles, smooth muscles and cardiac muscles.* . . . In this sentence the author mentions the kinds of muscles we all have. . . That means that not all the muscles are similar. . . What are the characteristics of each one?
- (4) *Skeletal muscles form the flesh of our body and are usually joined to our bones.* Mm. . . maybe these are the muscles I know because it says 'the flesh'. . . and if I touch my arm. . . I'm feeling my muscle. . .
- (5) *The contraction and relaxation of skeletal muscles make our bones move.* I see. . . when these muscles contract or relax, we can move our arms and legs. . .
- (6) *These muscles only move when they receive an order from the central nervous system: they realize voluntary movements.* . . True. . . If I want to move my arm or my leg, I can do it, I can control their movement. . .
- (7) *Smooth muscles are found in the walls of organs of the digestive apparatus, in blood vessels and in the bladder.* Mm. . . Now the author mentions another kind of muscle. . . the smooth ones. . . what are their characteristics? . . . Before, the author had mentioned the striated muscles. . . In what aspects are they different from one another?
- (8) *These muscles move in an automatic, continuous and involuntary way. They do not obey orders from the central nervous system. Instead they are controlled by the autonomic nervous system. The movement of the organs of the digestive apparatus is an example of how smooth muscles function.* I see. . . you can't move these muscles when you want. . . this may be the difference. . . because these are controlled by the ANS and the others by the CNS. . . Actually, I can't move my stomach muscles when I want. . .
- (9) *Cardiac muscles are the muscles of the heart. Like smooth muscles, cardiac muscles move in an involuntary way. However, the two kinds of muscles are very different from each other in form. The heart beats in a rhythmic and involuntary way during our whole life. Well. . . these muscles are also involuntary. . . What has the text said up to this point? That there are three kinds of muscles, skeletal, smooth and cardiac, and some of the characteristics of each kind of muscle. . . Let's go on. . .*

MAIN IDEA COMPREHENSION

An example of teacher training: modelling

The trainer introduces the task stating the purpose of the training (e.g. 'Today we are going to learn how to teach our pupils the classification structure'), its relevance for students' learning (e.g. 'Classification is a structure that appears very frequently in textbooks'), and the main idea of the kind of texts to which the session is devoted (e.g. 'The most important information that the author of this kind of text is trying to communicate is the category system itself'). After this, he (or she) gives a text to the teachers being trained. Then he or she reminds the teachers that, in order to show how they should act in their classrooms, he is going to play the role of a teacher and they have to adopt the role of their students. After this introduction, the modelling begins.

(In the following example, the sentences of the text being used are written in italics, whilst the trainer's thoughts, expressed aloud, are in roman type.)

(1) *THE MUSCULATURE.*

The musculature. . . this title. . . I think that this text is going to tell me how our body muscles are. . . or perhaps what they are useful for. . . Mm. . . Let's go on reading to test it. . .

(2) *Our muscles have, as their main function, to impulse all the movements and displacements that man realizes to accomplish the relation function.* Mm. . . I was right. . . muscles serve to allow us to move and go from one place to another. . . but what does the expression 'function relation' mean? . . . Perhaps the text will explain it later. . . Let's go on. . .

(3) *There are three kinds of muscles in the human body: skeletal muscles, smooth muscles and cardiac muscles.* . . . In this sentence the author mentions the kinds of muscles we all have. . . That means that not all the muscles are similar. . . What are the characteristics of each one?

(4) *Skeletal muscles form the flesh of our body and are usually joined to our bones.* Mm. . . maybe these are the muscles I know because it says 'the flesh'. . . and if I touch my arm. . . I'm feeling my muscle. . .

(5) *The contraction and relaxation of skeletal muscles make our bones move.* I see. . . when these muscles contract or relax, we can move our arms and legs. . .

(6) *These muscles only move when they receive an order from the central nervous system: they realize voluntary movements.* . . True. . . If I want to move my arm or my leg, I can do it, I can control their movement. . .

(7) *Smooth muscles are found in the walls of organs of the digestive apparatus, in blood vessels and in the bladder.* Mm. . . Now the author mentions another kind of muscle. . . the smooth ones. . . what are their characteristics? . . . Before, the author had mentioned the striated muscles. . . In what aspects are they different from one another?

(8) *These muscles move in an automatic, continuous and involuntary way. They do not obey orders from the central nervous system. Instead they are controlled by the autonomic nervous system. The movement of the organs of the digestive apparatus is an example of how smooth muscles function.* I see. . . you can't move these muscles when you want. . . this may be the difference. . . because these are controlled by the ANS and the others by the CNS. . . Actually, I can't move my stomach muscles when I want. . .

(9) *Cardiac muscles are the muscles of the heart. Like smooth muscles, cardiac muscles move in an involuntary way. However, the two kinds of muscles are very different from each other in form. The heart beats in a rhythmic and involuntary way during our whole life.* Well. . . these muscles are also involuntary. . .

- (10) *The muscles are made of cell tightly bound, without intercellular tissue. Muscular cells, which are elongated and have several nuclei are called muscular fibres. Mm. . .* Now the author is not speaking about each kind of muscle. He's speaking about their components. . . and they are the same for the three kinds of muscles. . . What is the author trying to communicate? What is the main idea of this text? . . . Let's see. . . The first paragraph says what is the function of the muscles. . . in the next four paragraphs the author describes the kinds of muscles. . . and their characteristics. . . and in the last paragraph what the muscles are made of. . . Therefore. . . the author's purpose is to describe the different kinds of muscles in the human body: skeletal, smooth and cardiac muscles. Skeletal muscles realize the voluntary movements, and are found next to the bones. Smooth and cardiac muscles do not realize voluntary movements and are found in other parts of the body: plain muscles in the blood vessels, the digestive apparatus and the bladder, and cardiac muscles in the heart'.

Once the modelling is finished, a discussion takes place structured around a set of questions prepared in advance. Its purpose is to help the teachers become aware of key aspects of the process and their relation to the theory they have been told about before. The questions are the following:

- What have I been doing while reading the text?
- What kind of questions have I asked myself?
- What kind of problems have I found when trying to find the main idea of the text?
- What strategy have I used?
- Why have I used this strategy?
- When can the use of this strategy be more useful?

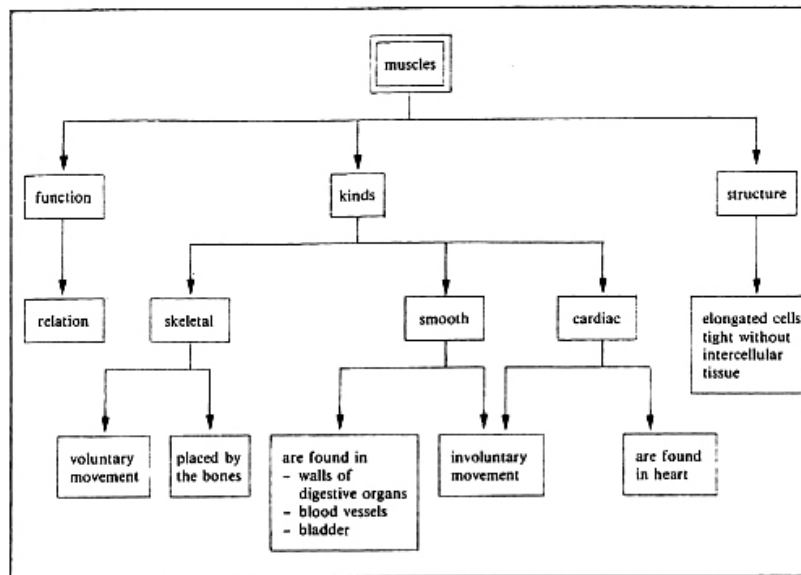
During the discussion, the answers listed below are underlined if they are given by the teachers. If they are not given, the instructor suggests them so as to orient teachers' attention to the key points. The numbers following each statement refer to the part of the modelling process that illustrates what the statement says.

- I have read the title and have thought about it trying to remember something I knew (previous knowledge activation) (1).
- I have identified text topic and have established a reading purpose (1).
- I have monitored my comprehension. I have detected a comprehension failure (2).
- I have related text content and what I knew about it (4, 5, 6, 8).
- I have made several inferences about the meaning of text content. Sometimes I have confirmed them later (3, 7).
- I have looked for the most general idea of the text, that is, the idea that summarizes the text (9). To do this, I have established hierarchical relations among text ideas. Expressions like 'kinds of' have been of great help for this (3).
- After considering relationships among text ideas, I have made a hypothesis about the most important information - text main idea - (10).

In the same way, the trainer models next the building of a graphical representation that can help to clarify the structure of the text. He draws the diagram shown in Figure 1 as he continues to speak.

Let's draw a diagram of relationships among text ideas. . . The text begins by talking about 'The musculature'. . . this is the topic. . . but the text talks about muscle functions and kinds of muscles. . . (first paragraph) . . . So I will put 'muscles' at the top, and function and kinds just below. . . (He draws). . .

Figure 1. Example of graphical representation of relations between text ideas



trying to inform us mainly about kinds or categories? . . . However. . . if this is his purpose, why doesn't the text begin by talking about kinds? Perhaps the beginning and the end serve only to complete the text. . . well. . . I'll mark 'kind' because it seems the key word for identifying the most important information. . . Mmm. . . I don't see any sentence that summarizes the text. . . that conveys the gist. . . I have to write one. . . Well. . . The text talks about categories. . . therefore, the sentence must include the information that allows the identification of category members. . . Let's try: 'There are three kinds of muscles in the human body: skeletal, smooth and cardiac muscles. Skeletal muscles realize the voluntary movements, and are found next to the bones. Smooth and cardiac muscles do not realize voluntary movements and are found in other parts of the body: smooth muscles in the blood vessels, the digestive apparatus and the bladder, and cardiac muscles in the heart'. Mm. . . I think it's OK.

Once the modelling process is finished, a discussion follows, structured in a way similar to that described above.

APPENDIX B. Examples of assessment instruments

Vocabulary Test (Item 5)

In the sentence *'This problem has made the Great Powers and even International Bodies look for a solution. ...'*, the expression *International Bodies* means:

- a. Multinational Enterprises.
- b. Powerful Countries.
- c. Institutions in the service of different countries.
- d. International medical services.

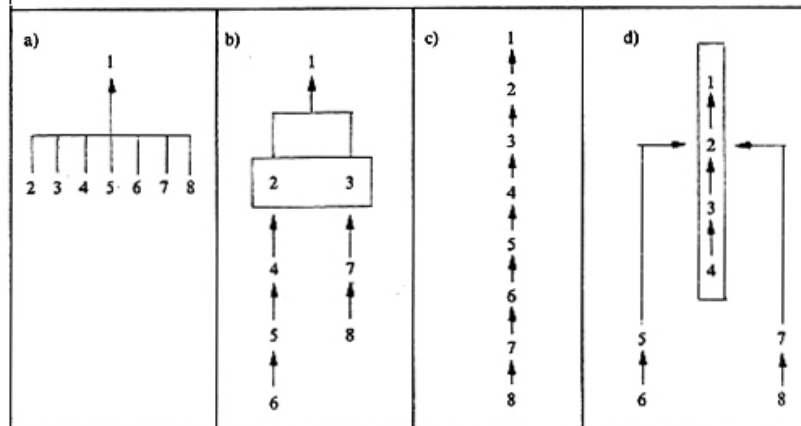
Example of the items included in the different subtests of the IDEPA Battery¹

TEXT 7

(1) There are substances (2) which are composed of different kinds of matter mixed in variable proportions. (3) Each component keeps its properties within the mixture, (4) and the properties of the mixture retain the properties of the different components.

(5) For instance, chocolate is a mixture of sugar and cocoa: (6) colour, taste and nutritional value are the result of the properties of each component. (7) Petroleum is another mixture; (8) gases, such as butane, liquids, such as petrol and solids, such as asphalt, are separated from it.

19) Which diagram best represents what the text's author communicates?²



20) If we find a text similar to the one above, in which the author describes the features of an object class and gives us some examples, the best way of discovering the main idea is:

21) Which of the statements below best expresses the text's main idea?

- a) There exist substances that are a mixture of others, and whose properties are derived from the properties of the different substances combined.
- b) There exist many substances formed of different components.
- c) To mix two substances it is necessary that they share the same properties.
- d) When two substances such as sugar and cocoa are mixed, the result is a substance – chocolate – that keeps both properties.

NOTES

¹ Subjects have to answer each item on the same text in the order shown by this example. However, each one of the kinds of item shown belongs to a different test: a) items like It. 19: test of graphical representation of text structure; b) items like It. 20: test of strategy knowledge; c) item like It. 21: test of main idea identification.

² Instructions that explain the meaning of the different kinds of arrow and sign that can be found throughout the test are given to students before they answer this test.

APPENDIX C. Example of student training: modelling

Text: *THE INDUSTRIAL REVOLUTION*

1. *From the artisan's workshop to the factory.*

In the XVIII century, industrial products (clothes, shoes, agricultural implements, etc.) were made in artisans' workshops, using very simple instruments. However, at the end of the century the first factories started to appear in Great Britain. These were places with steam-powered machines and many workers under the supervision of foremen. The owner of the factory also owned the capital that was invested in the machines, the premises and the wages. It was he who organized the production, fixed the prices and took on the technicians to supervise and direct the workers.

This change took place in Great Britain because there was a powerful bourgeoisie, which became rich through trade, with a high standard of living that the low productivity of the cottage industries could not satisfy. The pragmatic bourgeoisie knew how to take advantage of the technical innovations of the time to create a new way of production.

In the following example, the sentences of the text being used are written in italics, whilst the teacher's thoughts, expressed aloud, are written in roman type. The teacher starts reading the title:

(1) *1. From the artisan's workshop to the factory.*

That is, they are going to describe a change. . . Let's see what the text says about it.

(2) *In the XVIII century, industrial products (clothes, shoes, agricultural material, etc.) were made in artisans' workshops, using very simple instruments. However, at the end of the century the first factories start to appear in Great Britain. These were places with steam-powered machines and many workers under the supervision of foremen.*

I see. . . the author is comparing artisan's workshops and factories. . .

- (3) *The owner of the factory also owned the capital that was invested in the machines, the premises and the wages. It was he who organized the production, fixed the prices and took on the technicians to supervise and direct the workers.*

What can be the relationship between the capital and the change that took place? Without the capital, would the change have happened?

- (4) *This change took place in Great Britain because there was a powerful bourgeoisie, which became rich through trade, with a high standard of living that the low productivity of the cottage industries could not satisfy.*

Well. . . it seems that the desire of improving the standard of living was the key of the change. . . and the money for improving this standard. . . Mm. . . money was also necessary to pay machines and workers. . . it seems that money also played an important role in this change. . .

- (5) *The pragmatic bourgeoisie knew how to take advantage of the technical innovations of the time to create a new way of production.*

I see. . . technical innovations were needed to create new ways of production. . . therefore, they also are a factor of change. . . Mm. . . pragmatic bourgeoisie? . . . it seems that people need to be pragmatic enough to take the initiative needed to carry the changes out. . .

Let's think it over. . . In this text the author makes comparisons between the artisan and the factory production. . . he describes their characteristics and also the different causes that produced the change.

I am going to represent this in a diagram.

Teacher: Well, let's see what is the most important thing that the author is trying to communicate to us. Look at the top of the diagram. We have a set of factors – bourgeoisie and trade – that produced money. These factors, together with some others – technical innovations, workers, initiative, and demand, originated the changes from artisans' workshops to factories. Then, what is the structure of the text?

Student: It seems that its structure is causal because the author mentions causes and consequences.

Teacher: Well. What are the consequences?

Student: The change from the artisan's workshop to the factories.

Teacher: And what are the causes of this change?

Student: The bourgeoisie, that became rich as a consequence of trade. . .

Student: The money, the technical advances. . . the workers? . . . the demand. . .

Teacher: Very well. We are going to find the main idea of the text now. Remember that the main idea of a text has two parts. It includes the topic and the most important assertion the author makes about the topic. In this case, as the text as a cause-effect structure, the main idea has to include a summary of the causes mentioned. Then, what is the topic of the text? What is the text about?

Student: This text is about the causes of change from artisan's workshops to factories.

Teacher: O.K. We have the first element of the main idea. Now, we have to enumerate the causes. . .

Student: The bourgeoisie. . .

Student: The demand of products for improving the standard of living. . .

Student: The money, the technical advances. . . the workers. . .

APPENDIX E

THE SELF-REGULATED LEARNING INTERVIEW SCHEDULE (SRLIS)

Learners' name.....Grade.....

	Indicators	1	2	3	4	5		%
1.1	In preparation for a test have a method that will help remind me of what was							
1.2	What I do if I'm having trouble understanding or remembering what was discussed							
2.1	I have a method or methods that help me plan a History paper that affects my report card grade							
2.2	What I do when there are there are difficulties with the topic							
3.1	What I do when I don't understanding Maths problems at home							
3.2	What I do if it is a very difficult problem.							
4.1	I have methods of checking Science or language grammar exercises when it is finished.							
4.2	What I do if the assignment is difficult							

5.1	I have a special method for preparing the end of term test.							
5.2	When the tests are especially difficult I have a way out							
6.1	When taking a test I have a method for obtaining as many answers as possible							
6.2	If the test questions are very difficult I have a method							
7.1	I can motivate myself even when I have difficulty completing homework assignments because there are other interesting things.							
7.2	I can even meet pressing deadlines.							
8.1	have a way of arranging an appropriate place where I can study							
8.2	What I do if I still cannot concentrate despite the well arranged study place							

APPENDIX F

THE ADAPTED MOTIVATED LEARNING AND STUDY QUESTIONNAIRE (MLSQ)

The following statements were put to the respondents, and they were asked to comment on each statement on a 5-point scale (Very untrue of me, Untrue of me, Not sure, True of me, Very true of me).

(a)

- 1 I put together information from class and from textbooks when I study.
- 2 I remember all class info to answer H/W questions correctly.
- 3 It is hard to decide what the main ideas are when I study. (*R)
- 4 I put important ideas into my own words when I study.
- 5 I always try to understand what the teacher is saying even if it does not make sense.
- 6 When studying I try to remember as many facts as I can.
- 7 When studying I copy notes over to help me remember the material.
- 8 When I study I practice saying important facts over and over to myself to retain info.
- 9 I use what I already learned from old assignments and from textbooks to do new assignment
- 10 I outline the chapters in my book to help me study.
- 11 When I study, I construct pictures that help me to understand and remember the material.

(b)

- 12 I ask myself questions to be sure I know the material I have been studying.
- 13 When the work is hard I either give up or study only the easy parts. (*R)

- 14 I work on practice exercises and answer end of chapter questions even when I don't have to.
- 15 Even when study material is dull and uninteresting I keep working until I finish.
- 16 I begin to study I try to determine what I need to learn and what to do to learn it.
- 17 After reading for class I often find that I don't know what it's all about. (*R)
- 18 I find that when a teacher is talking I think of other thing and don't really listen to what's being said. (*R)
- 19 When I'm reading I stop once in a while and go over what I've read.
- 20 I work hard to get a good grade even if I don't like a learning area or a class.

*R- These questions were reflected before the index was constructed.

Adapted from: *P. Pintrich and E. De Groot (1990)*

APPENDIX F1

RECORDING SHEET FOR MLSQ
(Strategies assessment)

Learners’ name

Grade.....

		1	2	3	4	5	Total	%-age

APPENDIX F2

SELF-EFFICACY (MLSQ)

22 I expect to do well in this class				
23 I know I can understand and learn ideas and material taught in this class				
24 I can do an excellent job of problems and tasks assigned				
25 My learning strategies are excellent				
26 Compared to others I think I know a great deal about the learning areas in this class knowledge.				

APPENDIX G

THE CHILDREN'S SELF-EFFICACY PERCEPTION SCALE (CPSES)

The responses to the questions “How well can you ...” are summarized as follows in frequency tables:

How well can you ...

Indicators	Not at all like me	Not very much like me	Somewhat like me	Fairly much like me	Very much like me		
.... learn mathematics?							
2.... learn social science?							
3 ...learn natural science?							
4.... learn English?							
Before							

5... learn Home Language?							
6... finish homework and assignments by deadline?							
7... prioritize study over other interesting things?							
8.... concentrate on school subjects?							
9... take class notes of class instruction?							
10... integrate library information with class assignments?							
11... organize your schoolwork?							
12... plan your schoolwork?							
13... remember information presented in class and textbooks?							
14... arrange a place to study without distractions?							

15... motivate yourself to do school work?							
16... participate in class discussions? Before							
17... live up to what your parents expect of you?							
18... live up to what your teacher expects of you?							
19 ...live up to what your peers expect of you?							
20... live up to what you expect of yourself?							
21... Work in a group?							

APPENDIX H

Learning content comprehension and strategy -application questions

Questions based on the following:

1 goal definition

2 plans to attain the goals

3 identifying the main ideas

4 Summarising

5 Rehearsing

6 Classifying

7 monitoring and regulating through

- self-questioning
- re-reading
- help-seeking

8 Use of structural/pictures spatial- verbal displays for text information substitution.

9 contextual questions

10 Text content questions

a) Descriptive Statistics

APPENDIX I

Questions:	Cognitive processes the questions are intended to induce in learners
Explain “why” or “how?”	Analysis of processes and concepts involving explicit translations of terms.
What is the main idea of...? Or other question stems such as: Who, When?	Identifies explicit or implicit central idea (s) in the text
How to use...	
What are the examples?	Mostly applying prior knowledge (elaboration and organisation by classification)
What do you think will happen if...	Also retrieval of background knowledge and integration of new and old language to make predictions
What are the differences and similarities between... and...?	Analysis of concepts through comparison and contrasting
What are strengths and weaknesses of?	Analysis and integration of concepts
How does..... Affect..?	Analysis of relationships
How does it relate to previous studies or personal experience?	Activation of prior knowledge and integration with new ideas
What conclusion can you draw about...?	Reflecting on text and summarizing

Table 4.3: Generic Self-questions with corresponding intended responses

APPENDIX J

The following scheme depicting main idea summarisation rules was displayed:

IDENTIFY	WRITE (in your own words)
Topic of text	Turn topic into a sentence reflecting main idea of text
Sub-topic/main idea and related ideas	Link together>One sentence or word
Another sub-topic/ related topic and related ideas	Link together> another sentence/word
Another subtopic/main idea and related ideas	Link together>another sentence/word
Another sub-topic/ main idea and related ideas	Link together> another sentence/word

Table 4.2 Rules for the summarisation of main points

Details of an explanation

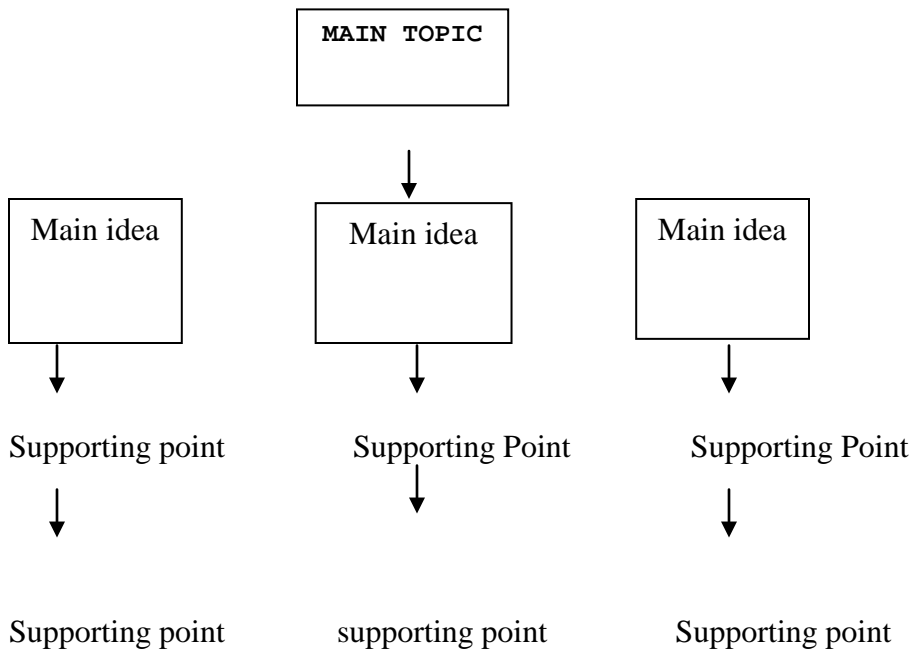


Table 4.2: Hierarchical text structure of main ideas

of structural patterns for organizing ideas and composing texts. Good readers know these patterns well and use them to comprehend a passage by making order out of it" (p. 29).

The following are some common rhetorical structures found in expository writing—that is, writing that is intended to inform or explain:

Generalization presents a main idea and supporting evidence, such as stating that pumps have been around for a long time and then giving the dates for the invention of different kinds of pumps.

Enumeration presents a list of facts, such as listing the major uses of pumps.

Sequence describes a logically connected series of events or steps in a process, such as describing the steps in how a bicycle tire pump works.

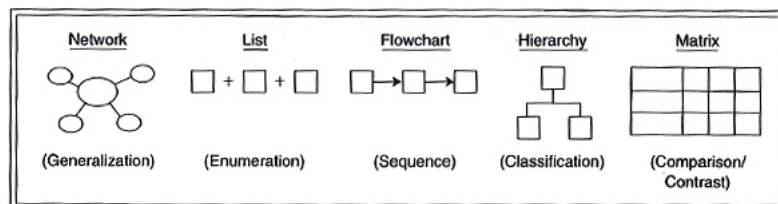
Classification breaks material into classes or categories, such as distinguishing the types and subtypes of pumps.

Comparison/contrast shows the characteristics of two or more things along several dimensions, such as describing the differences among centrifugal, sliding vane, lift, and tire pumps in terms of size, typical uses, and origin.

These five rhetorical structures can be represented respectively as a network, a list, a flowchart, a hierarchy, and a matrix, as shown in Figure 10-3. A major task of learners is to appropriately impose a rhetorical structure on incoming prose.

Let's focus on sequence structures in which the reader's task is to mentally construct a mental model of the operation of some system such as how a pump works. A mental model is a mental representation of the key parts of a system as well as the cause-and-effect relations among state changes in these parts. A mental model includes (a) component models—the location and potential states of each major part in the system, such as knowing that a pump includes a handle that can be up or down, a piston that can be up or down, an inlet valve that can be open or closed, an outlet valve that can be open or closed, a cylinder that can have high or low air pressure, and so on; and (b) a causal model—the cause-and-effect chain of how a change in the state of one part can affect a state change in another part, such as knowing that as the handle is pushed down the piston moves down, which in turn causes the inlet valve to close, which causes the air pressure in the cylinder to get higher, which causes the outlet valve to open, and so on. When the to-be-learned material is an explanation of how something works, the learner's job is to build a mental model.

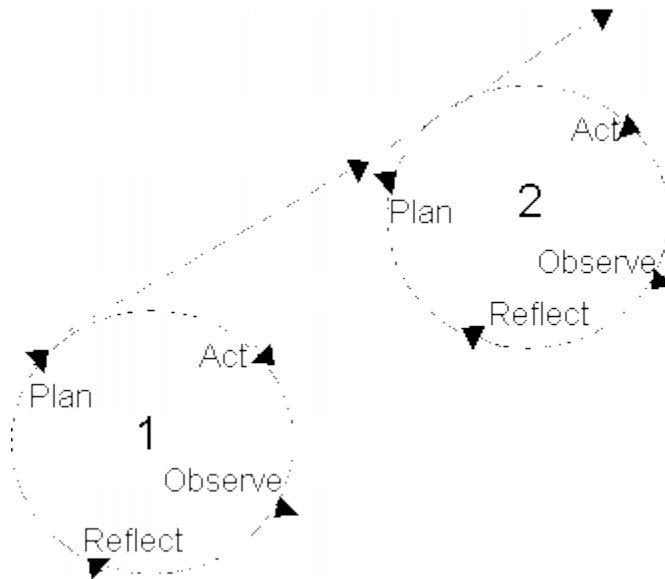
FIGURE 10-3 Five rhetorical structures

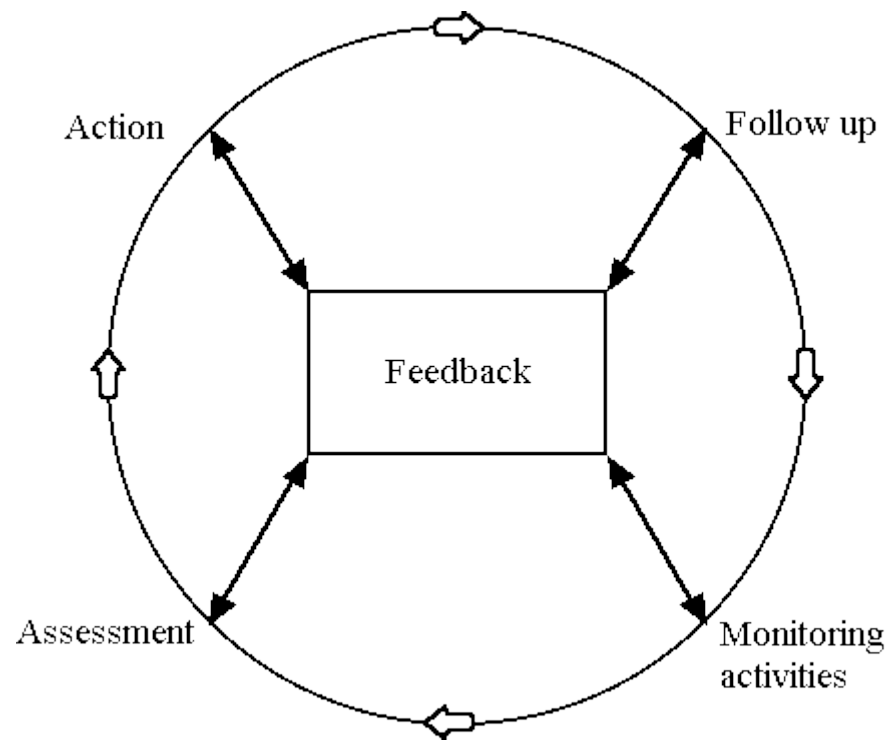


Sources: Adapted from Cook, L. K., & Mayer, R. E. (1988). *Teaching readers about the structure of scientific text*. *Journal of Educational Psychology*, 80, 448–456; Chambliss, M. J., & Colfee, R. C. (1998). *Textbooks for learning*. Oxford, England: Blackwell.

APPENDIX L

Zubber-Skerrit's spiral model of action research: The four moments





APPENDIX M

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TO WHOM IT MAY CONCERN

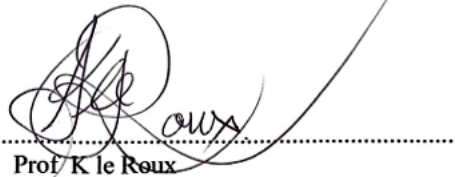
I hereby declare that the dissertation of

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**The influence of learning strategies on the self-efficacy and academic
achievement of township primary school learners**

was edited by me.



Prof K le Roux