

THE RELATIONSHIP BETWEEN READING ABILITY AND ACHIEVEMENT IN ENGLISH AS A
SECOND LANGUAGE AND OTHER SUBJECTS AT MATRIC LEVEL.

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DECLARATION

I MATHEWS MOKONE KOKONG declare that THE RELATIONSHIP BETWEEN READING ABILITY AND ACHIEVEMENT IN ENGLISH AS A SECOND LANGUAGE AND OTHER SUBJECTS AT MATRIC LEVEL is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

signed: _____



M.M. KOKONG

JANUARY 1991

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CHAPTER 1

1 STATEMENT AND MOTIVATION OF THE PROBLEM

1.1 The problem

The black child in Bophuthatswana is faced with mastering three languages: Setswana, English and Afrikaans. English as a second language is used as the medium of instruction in black schools from standard three and throughout the secondary school and tertiary institutions. The black child therefore must master English as a second language in order to be a proficient reader of English and other subjects as well. Proficient reading is an essential means for performing well in English as a second language, and in other subjects.

Reading is recognized as the most important skill taught in elementary schools, because it enhances the cognitive development of the child (Bond and Jinker, 1975 : 119). His all-round academic development is dependent on his reading ability which can be defined as a complex set of co-ordinated processes that include perceptual, linguistic, and conceptual operations: "from encoding letters on the printed page to determining what or who is referred to by a particular phrase or articles" (Beck and Carpenter, 1986 : 1098).

Reading is a communicative process that takes place between the author and the reader. Generally, reading is defined as an interactive and integrated process involving the development of the technical skills necessary in seeing the relationship between the sound and meaning of words, and the interpretation of the ideas represented by words, sentences, and paragraphs (Mahlangu, 1982 : 11). Reading is not a skill as such but a set of skills or a process composed of many different sub-skills. Kennedy (1974 : 3) defines reading "as the ability of an individual to recognize a visual form, (to associate) the form with a sound and/or meaning he has learned in the past, and on the basis of past experience, (to understand) and (interpret) meaning". The establishment of reading as a communicative and interactive process requires three important aspects, namely, the language aspect, the visual aspect, and the perceptual aspect (Mahlangu, 1982 : 12 ; Travers, 1982 : 29-76 and 219-252).

For the reader to be able to understand a text, he or she must attribute meaning to what he or she is reading. This attribution of meaning is dependent on the reading ability of the child. Perfetti (1982 : 4-9) provides a careful analysis and evaluation of how reading works, how words are identified, and how sentences and texts are comprehended and how reading is related to the process of speaking the language. Mawasha (1976 : 1-200) investigated the influence of reading ability in English on the scholastic achievement of students in Gazankulu. The results of his investigation revealed that these two aspects, namely reading ability and scholastic achievement are related. In this study the relationship between reading ability and achievement in English as a second language as well as achievement in two other subjects, will be investigated. If it could be clearly shown that reading ability influences achievement in English and other subjects at the std 9 and std 10 level in one specific school area, namely the Ditsobotla Circuit of Education, a further study on how to improve the reading ability of the black child, and thereby enhance his achievement in English as a second language and other subjects should be done.

This study will be limited to the study of reading ability of std 9 and 10 pupils and its relationship to the comprehension of English and other subjects studied through the medium of English, as measured by achievement. With this problem in mind, an attempt will be made first to determine whether there is a relationship between reading ability and achievement in English and other subjects in the last two years at secondary school in the Ditsobotla Circuit of Education.

2 AIM OF THE INVESTIGATION

The aim of this investigation is to determine the relationship between reading ability and achievement in English as a second language and other subjects studied through the medium of English, at this identified level. (The colloquial term, "matric", will be used to refer to this level of learning in this study.) To accomplish this aim a literature study will be presented and experimental research conducted.

3 RESEARCH HYPOTHESES

- 3.1 Pupils who are exposed to a reading programme at matric level achieve better results in English as a second language than those who are not exposed to a reading programme at that level.
- 3.2 Pupils who are exposed to a reading programme at matric level achieve better results in other subjects than those who are not exposed to a reading programme at that level.

4 METHOD OF INVESTIGATION

A literature study with regard to reading ability and comprehension has been done.

An empirical investigation has been done in which the relationship between the results of the reading ability and the comprehension test and the results in two other subjects has been determined.

5 RESEARCH PROCEDURES

A literature study of the relevant literature on previous research with regard to reading ability and comprehension has first been made to highlight the general tendencies giving direction to the empirical study. The literature study is described in chapters two and three.

The experiment described in chapter four, has been designed as follows:

GROUP	PRE-TESTS			PROGRAMME	POST-TESTS		
E	Y1	Y2	Y3	X	Y1p	Y2p	Y3p
C	Y1	Y2	Y3	--	Y1p	Y2p	Y3p

- E - experimental group
- C - control group
- X - manipulation by a reading programme
- - old reading method ; no manipulation
- Y1, Y2, Y3 - pre-tests in English, Biology and History
- Y1p, Y2p, Y3p - post-tests in English, Biology and History

6 VARIABLES

The independent variable (X) is a reading programme; and the dependent variables are achievement in English as a second language, Biology and History as measured by the post-tests (Y_{1p}, Y_{2p}, Y_{3p}).

7 RESEARCH POPULATION AND SAMPLE

The target population is all black pupils at secondary schools in Bophuthatswana. The accessible population from which the sample has been selected is all matriculation pupils in the Ditsobotla Circuit of Education. The specific and actual sample has been selected from the accessible population employing a random sampling method.

8 MEASURING INSTRUMENTS

Monthly tests for standard nine and ten have been used as measuring instruments in the pre-tests, and the tests set by the different subject teachers in consultation with the investigator have been used in the post-tests as measuring instruments.

9 STATISTICAL TECHNIQUES

Descriptive statistical methods have been used to present the results. In this investigation t-tests have been used to find out whether there are differences between the improvements in academic achievement of the different subjects for the experimental and control groups.

10 RESULTS AND SUMMARY

The results are discussed in chapter 5 and the summary, conclusions, implications, shortcomings and possibilities for further research are given in chapter 6.

CHAPTER 2

2 COMPREHENSION

2.1 INTRODUCTION

Learning is an interactive process, which takes place between pupils, teachers and learning tasks within the learning environment of the school (Keefe, 1986 : 3). The activities of teachers and pupils show a wide variation in pattern, style, and quality. There is general agreement among educationists that learning activities involving language are crucial factors in a child's education (Keefe, 1986 : 3-4; Stubbs, 1983 : 15). The questions which will be addressed in this chapter are: How is a child's language related to his academic success or failure at school, and does a child's reading ability in English as a second language bear any relation to his general academic achievement? Attention will be given mainly to learning, comprehension, and language acquisition as these factors have been found to influence the failure or success of the child at school (Stubbs, 1983 : 15).

Language plays a central role in school classrooms. In the teaching environment pupils are dealing with language for most of the day either with the spoken language of the teacher or the pupils, or with the language written in the books. Teaching and learning typically comprise of linguistic activities such as listening, thinking, explaining, paraphrasing, and summarizing (Stubbs, 1983 : 17). A teacher cannot easily separate teaching concepts in, say History, from teaching learning strategies, for instance how to use the appropriate History-related terminology, how to construct a correct argument and how to comprehend History text books. Hence Mc Keachie, Pintrich, Lin, and Smith, (1986 : 30) emphasize the need to teach learning strategies. Language and learning strategies both influence learning outcomes and the transfer of what has been learned (see par. 2.4).

In this chapter comprehension is discussed in the context of learning, information processing, learning styles, and learning strategies. The

relation of text to background knowledge; to the importance of elaborating on the text; to the monitoring of one's own comprehension, that is, metacognition; and to comprehension, are also discussed.

2.2 LEARNING

2.2.1 Definitions of learning

Learning will first be defined from a behavioural or productive perspective. Definitions of learning have to be considered from the sets of circumstances that apply when learning occurs, that is, when certain observable changes in human behaviour take place that justify the inference that learning has taken place.

Lefton, (1985 : 63) defines learning as "a relatively permanent change in behaviour that occurs as a result of experiences in the environment." This definition of learning puts great emphasis on the product of learning. Gagné (1977 : 3) also emphasises the product definition of learning when he says "it is a change in human disposition or capability, which persists over a period of time, and which is not simply ascribable to processes of growth." Both these definitions emphasize the end result of learning, namely the behaviour that is manifested after the learning has taken place. What is, however, equally important, is to know how this end result (or outcome) of learning has come about. The processes occurring during learning are thus omitted from these definitions.

The second perspective on learning is from a process definition of learning. The major source of new ideas in recent years about learning has been provided by theories related to information processing, storage and retrieval (Travers, 1982 : 14). Schmeck (1988 : 4) defines learning as "the process whereby the nervous system is transformed by its own activity". Neural activity changes the active neurons and this change forms the structural basis of learning. The change thus occurs as a direct result of the processing of information (see par. 2.2.4), and learning can be seen as the tracks left behind by thoughts. This view is, to some extent, a reflection of current interest in

information processing in our society, an interest that has been developed because of the vast mass of knowledge that has been accumulated and the difficulties inherent in storing the information in a form in which it can become readily available. Learning viewed from a productive approach concentrates on memorization, while learning viewed from a process approach emphasizes learning via comprehension.

2.2.2 Overview of learning theory

Although early Russian work on reflexes and conditioning had already begun and Hermann Ebbinghaus's verbal learning studies were already history, learning theory was mainly developed by American researchers. (Miller, 1983 : 180-181; Travers, 1982 : 3-13; Gagné, 1977 : 6). To a great extent, the history of American psychology and the history of learning were synonymous until the 1960's. Behr (1988 : 46) states that there are two main groups of learning theories, namely, the behaviouristic theories or stimulus-response (S-R), and the field of cognitive theories.

Psychologists, like John Dollard, Neal Miller, and B.F. Skinner, who built their theories of learning on behavioural principles, share some important assumptions and practices (Morgan, King, and Robinson, 1986 : 592). One shared assumption is that much of the behavioural patterns originate from conditioned responses or from learning. This means, firstly, that behaviour originates somewhere in the learning history of the individual, often as early as childhood. A second assumption is that current conditions in the individual's environment help to maintain these behaviours. Thus, these learning theories seek to understand learning behaviour by studying learning history, their current environments, or both. Learning and behavioural theorists for example, Thorndike (theory of bond connections), Pavlov (respondent conditioning), Skinner (operant conditioning) also believe in testing their theories quantitatively and therefore focus on observable events and behaviours. (Behr, 1988 : 46-51; Vrey, 1979 : 225-226; Wentzel and Mahlangu, 1985 : 42-43).

Behaviouristic theories thus put greater emphasis on the learning

outcomes than cognitive theories do. The stimulus, evoking behaviour, and the response of the learner are emphasized and the learner is considered as a passive imbiber of information during the process of learning. The learner thus simply memorises what he has to know.

The second group of theories are called cognitive theories. Cognitive refers to "the processing of the information from the environment that is received through the senses" (Morgan et al, 1986 : 169). Cognitive processes involve the selection of information, the making of alterations in the selection of information, the association of information with other data, the elaboration of information in thought, the storage of information in memory, and, when needed, the retrieval of stored information. The major source of information of new ideas in recent years concerning how learning may be viewed has been provided by theories related to information processing, storage, and retrieval, and to computers to which they are linked (Travers, 1982 : 14; Morgan et al, 1986 : 169). In cognitive theories, emphasis is on the learning process. Learning, as already defined, refers to relatively permanent changes in behaviour as a result of experience. Putting the terms cognition and learning together gives a definition of cognitive learning: a change in the way information is processed and stored as a result of experience. In other words the significance or meaning (i.e. comprehension) of events has been changed, due to past experience and new associations have been formed, and these changes have been stored in memory for future use. The learner actively participates in the process of learning (Dweck, 1986 : 1040-1049).

Contemporary cognitive theories of learning reflect a rather distinct break with the behaviouristic learning theories. The behaviouristic theories give little attention to the internal processing supposed to occur when something is learned, comprehended and retained. These theories are largely based upon the idea that associations are formed and stored as a result of learning (Miller, 1983 : 184). The cognitive group of theories propose an elaborate set of internal processes to account for the events of learning and retention. Expressed simplistically, in the behaviouristic theories the learner is passive while in the cognitive theories the learner is active. Behaviouristic

theories emphasise the learning outcomes, like, achievement or products of learning. They are closely associated with the product definition of learning. Cognitive theories put more emphasis on information processing, that is, the process comprehending and of what happens during learning. At the present time many educationists are fascinated with computers as models of how learning takes place. This has led to what is called information processing models of learning. (Gagné, 1977 : 16-17, Travers, 1982 : 24) The brain, like the computer, has to process information before that information can be effectively stored and used.

2.2.3 Components of learning

If one intends to improve learning, it is advisable to look for the factors exerting an influence on learning. The model of Thomas and Rohwer (1988 : 23) will be used as a basis for discussing the components of learning (Fig. 2.1). According to this model, the four components of learning are: student characteristics, course characteristics, study activities and learning outcomes. In order to review this model, it is first necessary to outline the relevant components in the learning process.

2.2.3.1 Student characteristics

Student characteristics can be divided into two main classes, namely, cognitive entry behaviour and affective entry characteristics. Cognitive entry behaviour entails experience and ability which imply the extent to which the student has already learned the basic prerequisites for the learning to be undertaken. Affective entry characteristics refer to the extent to which the student is or can be motivated to engage in the learning process, and entail volition - related characteristics (Keefe, 1986 : 6; Thomas and Rohwer, 1988; 26). As indicated in Figure 2.1, study activities are influenced both by course characteristics and by student characteristics.

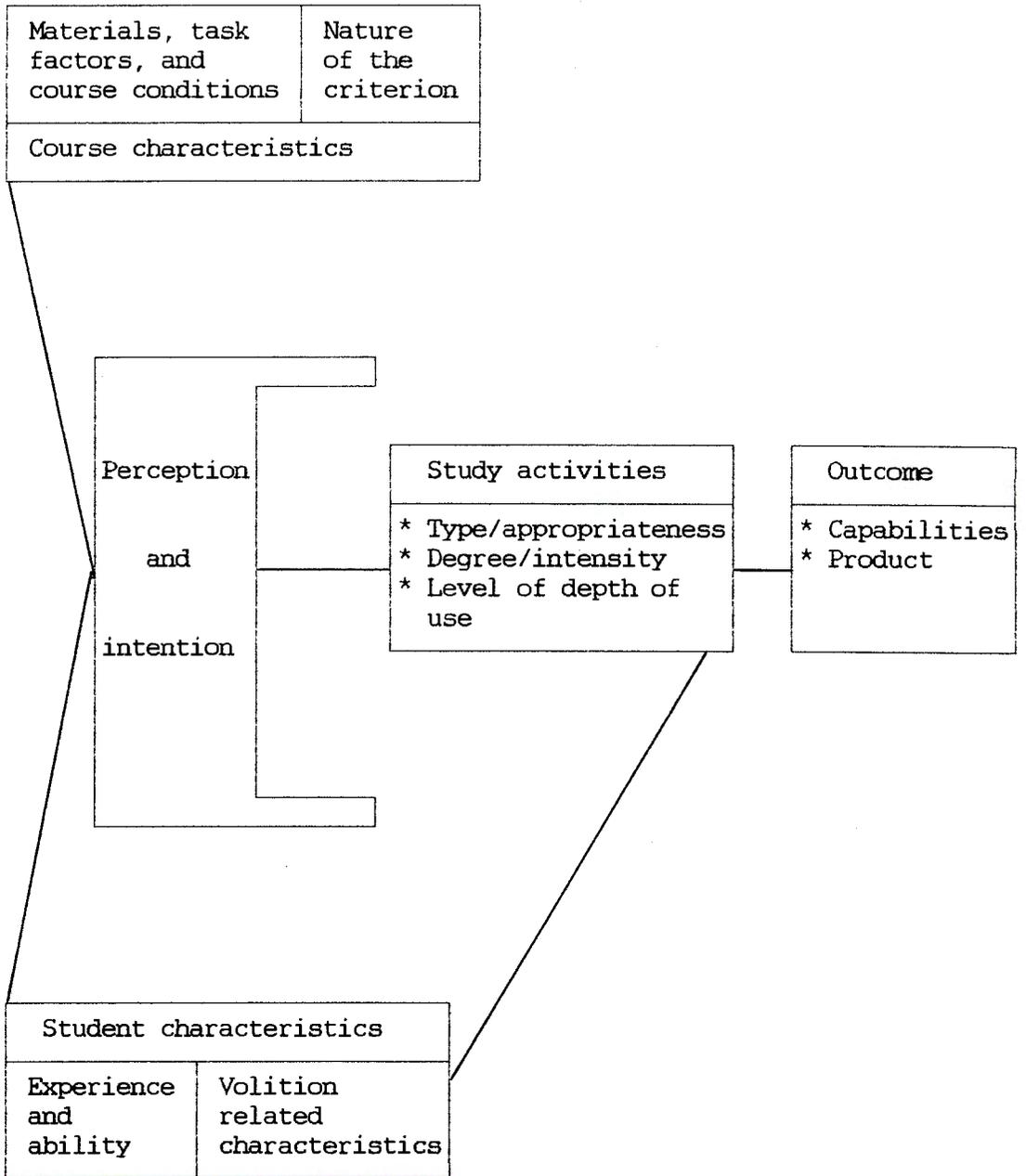


Fig. 2.1 A model of the relationships among the components of learning (Thomas and Rohwer, 1988 : 23).

Age-related changes in student cognition, across the period ranging from early childhood and the early years of schooling through adolescence and college years, proceed along a number of dimensions. These dimensions include self-awareness, metacognitive proficiency (see par. 3.6.4), memory and thought processes and effective cognitive capacity (Paris and Winograd, 1989 : 2; Thomas and Rohwer, 1988 : 27). Across this period, and especially during the high school years, students additionally acquire increasingly sophisticated learning strategies, skills in their deployment, and knowledge of the range of their utility. Piaget refers to this stage as the formal-operational stage. In as much as learning is a skillful cognitive activity, it may be influenced by general ability as is any other complex cognitive task (see chapter 3). Compared to low-ability students, high-ability students have been found to be more sensitive to task demands, to have more effective study and reading methods, to use those methods more skillfully, to have a larger repertoire of methods, to use this repertoire more flexibly across tasks, to use study methods spontaneously, and to prefer instructional situations where learning is challenging and can be followed independently (Thomas and Rohwer, 1988 : 27).

Students can master learning goals more effectively if they have experienced the demand before, have previously used a particular learning strategy to master the goal, and have practised and received feedback in the use of the strategy. A central aspect of learning is the integration of new information with a pre-existing information base (see information processing model, par. 2.2.4) (Thomas and Rohwer, 1988 : 27; Spiro, 1980 : 254). Students who have more prior knowledge and more content-relevant, high-order conceptual structures, other things being equal, should be more adept at learning content than less knowledgeable students. Content knowledge can be differentiated from the actual execution of processes such as monitoring, planning, or checking of learning, which are sometimes collectively referred to as metacognition (Lundberg, 1987 : 408; Brown, 1984 : 213; Thomas and Rohwer, 1988 : 27).

2.2.3.2 Study activities or learning strategies

Study or learning activities consist of a variety of processes and behaviours, both covert and overt, that occur during learning (Klauer, 1988 : 354; Thomas and Rohwer, 1988 : 23). Study or learning activities include 'primary' task-focused activities as well as 'support' or learner-focused activities. The functions involved in learning activities can be divided into two classes, namely, cognitive activities - which serve to facilitate information processing or improve criterion performance, and, self-management activities - which serve to maintain and enhance the attention, effort, and time students devote to learning (Brown, 1984 : 213).

2.2.3.3 Course characteristics

Course characteristics refer to the numerous external factors and conditions influencing studying or learning, such as grading practice, teacher characteristics, reading assignments, exercises, projects, etc. (Thomas and Rohwer, 1988 : 26).

Learning goals and objectives included in the course determine how and what is being learned. These course characteristics can influence not only what and how students learn, and what a student achieves in the course, but also what teachers conclude about what students have learned (Thomas and Rohwer, 1988 : 26).

2.2.3.4 Outcomes

Learning results are specific outcomes that can be classified into two categories; namely, capabilities, and informational products. Informational products differ with respect to the forms of processed information, namely verbatim, interpreted, and constructed information. In the case of the verbatim information, for example, students attempt to discriminate exact from inexact reproduction of learned information with interpreted information, students identify paraphrases of information they

have learned or produce the gist of passages they have read. Students also deal with constructed information and have to identify underlying presuppositions, intentions, within the text connections (such as inferences and comparisons) and connections of textual information with prior text knowledge (Spiro, 1980 : 87; Thomas and Rohwer, 1988 : 22).

According to Bloom (1976, referred to by Keefe, 1986 : 4-6) learning will be at a high level and student outcomes will vary little when cognitive and affective entry behaviours and the quality of instruction are appropriate. When student entry characteristics and instructional quality are more varied, learning outcomes will vary accordingly. As learning outcomes are determined by student characteristics, information processing and instructional quality, it is important to investigate the interactive relationship of the results of learning outcomes and what pupils have been taught, as is being done in this study.

2.2.4 Information processing

During the course of an act of learning, a number of different learning processes are at work. The processes of learning are identified from the basic structures of the information processing model (Gagné, 1977 : 52). These processes and structures have been inferred from empirical studies of learning. Many researchers study learning in humans as if they process information the way a computer does, through a sequence of coding, storage, and retrieval (Lefton, 1985 : 112). One must keep in mind that the human brain does not work exactly the way computers do. From the model of information processing (Fig. 2.2) employed in some modern theories, one can identify the phases of processing which take place from the beginning to the termination of an act of learning.

2.2.4.1 The flow of information

As a person enters a house, he is instantly bombarded with a tremendous number of stimuli : the feeling of a carpet under his

feet, a change in temperature, odours coming from the fire place, the sound of a crying baby, etc. From the environment, the learner receives stimuli which activate his receptors and transform the stimuli to neural information (Lefton, 1985 : 300, Gagné, 1977 : 52) Initially this information enters a structure called the sensory register where it persists for a very brief interval.

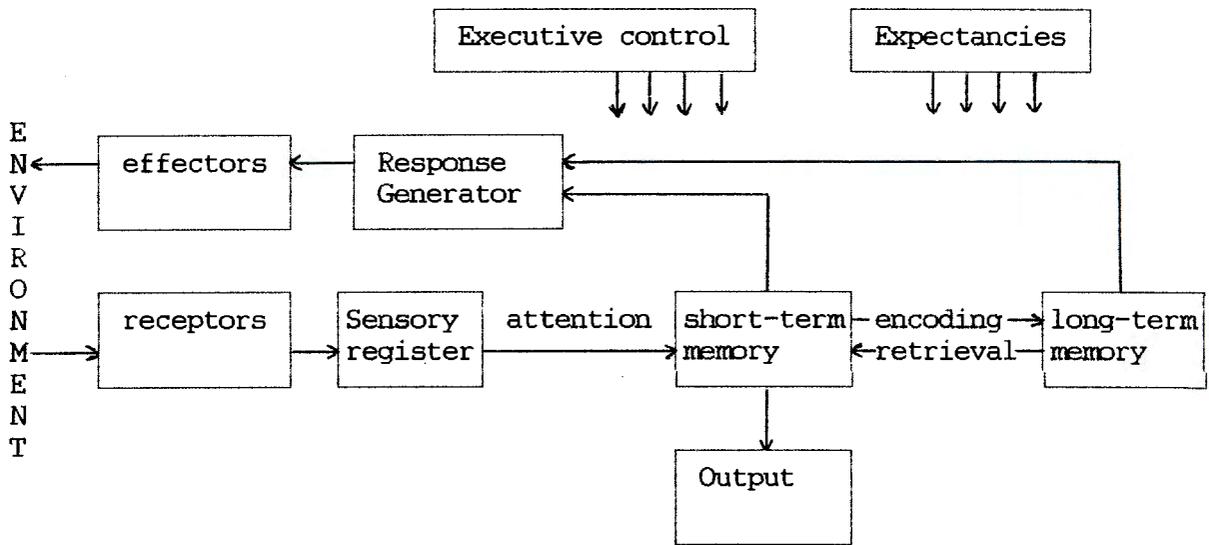


Figure 2.2. A model of information processing theory (Gagné, 1977 : 52).

In the classroom situation, the stimuli can be information from the outside world, such as reading materials or a teacher's lesson. For example, if the learner is reading a book, then the printed words are represented as visual sensory stimuli. The sensory memory, referred to as simply SM, is the part of the memory that operates while one is experiencing an event with one's senses - it is the sensory registration of an event (Lefton, 1985 : 301; Gagné 1977 : 53; Weinstein, C.E., Goetz, E.T. and Alexander, P.A., 1988 : 14). The sensory memory is sometimes known as the iconic memory because it recalls an image or a picture. In spite of the fleeting nature of the products of the sensory memory, it is well to remember that all learning begins in this memory structure with the processing of stimuli by the senses. The components of this sensory representation which persists for a longer period must be the object of the process of

attention (often equated with selective perception). The remaining components simply die away and no longer affect the nervous system.

At any given moment, however, the sense organs are bombarded by a multitude of stimuli from the environment. Yet only a few of them are perceived clearly. Attention is the term given to the perceptual process that select certain inputs for inclusion in our conscious experience, or awareness, at a given time, called the short term memory (Fig. 2.2). Essentially, this process is known as selective perception, and depends upon the learner's ability to attend to certain features of the contents of the sensory register, while ignoring others. The process of attention divides the field of experience into a focus and a margin. Events that are perceived clearly, are at the focus of experience. Other items which are perceived dimly; we may be aware of their presence, but only vaguely so. These items are in the margin of attention. Since not all the information in the sensory channels can be processed, some inputs are filtered or partially blocked out, while some inputs are let through. Attending therefore accomplishes a transformation which forms a new kind of input to the short term memory, hereafter referred to as STM. (Morgan et al, 1986 : 109; Seifert, 1983 : 182-183; Gagné, 1977 : 53; Travers, 1982 : 40).

Information in the STM is kept active by regulatory processes like rehearsal. The process of rehearsal consists of keeping items of information in the centre of attention, perhaps by repeating them silently or aloud. The process of rehearsal takes place after the information has reached the STM. Once information has reached the STM, a learner can actively think about the material (Morgan et al, 1986 : 192; Gagné, 1977 : 15). A learner could, for example, rehearse by trying to find causal links connecting the ideas presented in the textbook material, or by trying to memorize a verbatim definition. This process of rehearsal involves learning styles and learning strategies (see factors influencing comprehension, par. 2.2.4). Metacognitive

strategies, that is, strategies on how to monitor and plan learning and reading, also come into the picture because they can influence how much rehearsal takes place, and thus, how long information can be held in the STM (Paris and Winograd, 1989 : 2). Short term memory can be described as "the memory process that temporarily stores information for immediate or short term use" (Lefton, 1985 : 114).

The next step in information processing is to transfer the information from the short term memory to long term memory, that is, the process of encoding (Fig. 2.2). Encoding means to relate information in the LTM with the new information temporarily stored in the STM. The information is assimilated, changed, etc. in the STM and only after this, the restructured (and understood) information is taken to the LTM to be "inserted" in already structured knowledge bases. This encoding also leads to comprehension. The information which is available as certain perceptual features in short term memory is transformed into a conceptual, or meaningful mode. The transformation of information can be done through the process of coding or chunking (Lefton, 1981 : 305-309; Gagné, 1977 : 54; Weinstein et al, 1988 : 15).

Coding is "the process of assigning a meaningful label or symbol to a stimulus or event as a means of remembering it" (Lefton, 1981 : 305). When coding involves the replacement of one symbol or piece of information by another in an effort to remember the original piece of information, it is called substitution coding, which can be either acoustic - a visual stimulus is given a verbal code, or nonacoustic - a few lines are substituted for a set of directions. In addition to coding, individuals often use chunking to group or cluster more than one stimulus in some meaningful way in an effort to remember more. Learning and teaching strategies and learning and teaching styles aimed at the process of encoding can influence how fast information is encoded and how much is encoded (see par. 2.4). These strategies and styles can also influence the quality of the encoding process,

that is, the degree to which the new information is integrated with the existing knowledge, through the process of adaptation (Miller, 1983 : 71-74; Weinstein, 1988 : 16). Adaptation involves two complementary processes: namely, assimilation as the process of fitting reality into one's current cognitive organization; and accommodation as adjustments in the cognitive organization as a result of the demands of reality.

Encoded information is stored in long term memory through the processes of accommodation and assimilation. These processes takes place in the STM. The LTM is the part of the memory system that stores information that was formerly a product of the short term or working memory so that it can be retrieved and used when needed. Interference between newer and older memories may block the accessibility of stored information. Mainly, though, the phenomenon of forgetting may be due to the ineffective storage search and retrieval processes (Travers, 1982 : 165-166; Lefton, 1981 : 312).

Retrieval refers to transferring knowledge from the LTM to the STM. In order to be verified as learned, entities must be retrieved from long term memory (Fig. 2.2). It is generally supposed that the process called retrieval requires that certain cues depend, for example, on learning strategies and teaching strategies, learning styles, and metacognitive strategies, (Gagné, 1977 : 55; Keefe, 1986 : 5; Lundberg, 1987 : 408; Brown, 1984 : 213). The cues are provided either by external situations or by the learner from other memory sources (Fig. 2.3). The cues are employed to match or link what is learned, in a process of search. Perfetti (1982 : 34) refers to this process as context appropriate meaning. Retrieval of prior knowledge during learning should affect the overall amount learned, but will not affect the information stored in the LTM. The outcome of learning depends on both what is presented and the existing knowledge which is assimilated. Therefore, the type of existing knowledge that is retrieved and used in the assimilative context during learning would influence what is learned. For example, in

learning a new programme language using a computer, a learner would retrieve prior knowledge about how a computer works.

The next transformation along the route of information flow is accomplished by the response generator (Fig. 2.2). This structure determines the basic form of human responding, that is, whether a performance will involve speech, the large muscles of the trunk, the small muscles of the hand, or whatever (Gagné, 1977 : 56). Response generation is the first basic form of human responding in the processing of the information, which means that learning has taken place. Response generation determines the pattern of the performance such as the sequence and timing of the movement involved in the action to be accomplished. Response generation prepares the individual for a kind of activity that can be externally observed.

The penultimate stage of information processing consists of the activation of the effectors; this results in patterns of activity that can be externally observed. If what has been learned is a capability of stating the sense of a set of propositions, then achievement is the performance that shows that learning has occurred. If a motor skill such as writing with a pen has been acquired, then this performance may be exhibited, and its occurrence verifies to an external observer that this capability has been learned (Lefton, 1985 : 120; Gagné, 1977 : 56-57).

Learning is sometimes a process which appears to require the closing of a "loop" which began with stimulation from the external environment, that is, students try to get some ideas of how well they have remembered the material. The final link of this loop is an event which also has its origins outside the learner, in his environment (Fig. 2.2). Feedback is provided by the learner's observations of the effects of his performance (metacognition). This is the event that provides the learner with the confirmation or verification that his learning has accomplished its purpose, which can be comprehension or achievement. Although feedback usually requires a check which is

external to the learner, its major effects are obviously internal ones, which serve to fix the learning, to make it permanently available (Lefton, 1985 : 120).

2.3 COMPREHENSION

Our description of information flow and the processes involved in it provides a conception of the internal events of learning. Comprehension thus depends on effective information processing (Gagné, 1977 : 59).

2.3.1 Description and definition

It is generally assumed that comprehension entails "understanding something, retaining its meaning, and being able to use or apply materials appropriately" (Smith, 1978 : 229). When speaking of comprehension, it is important to realize that meaning is not a property of written materials themselves. It is something constructed in the mind: first in the mind of the writer, and then in the mind of the reader. When the reader comprehends, he is able to grasp the message conveyed by the writer and relate it to what he already knows. This process is very complex in most content reading areas reading where the reader must go beyond individual words and sentences and deal with a stream of incoming concepts and information, page by page. If he can't put it together in a holistic (cognitive structure) sense, he isn't comprehending. McNeil (1987 : 1) says "it is a process of using one's existing knowledge to interpret and arrive at one's own construction of what the text means". It is making sense out of the text by acquiring information from the context and combining disparate elements into a new whole.

Comprehension includes the ability to relate material to a personal framework of knowledge and to apply concepts to new situations. It also includes understanding of the information in the text as well as changing the knowledge used to understand the text in the first place. A good operational definition of comprehension is "putting together the message of the text with what the reader already knows, retaining the

product in a form accessible to recall, and being able to use it in constructive thinking" (Smith, 1978 : 228-230) in different subjects at a specific level. In the case of this study, comprehension signifies the understanding of the English language so as to be able to interpret subject content written and explained in English.

2.3.2 Processes leading to comprehension

Learning involves cognitive organization of information in the mind. Cognitive organization refers to "the tendency for thought to consist of systems" (Miller, 1983 : 70). Within a system, parts are integrated to form a whole. This whole is referred to as a schema. These systems are co-ordinated; there are inter-relationships among cognitive activities. During the learning process, the mind is not a grab bag of facts. Rather, it is a coherent view of the world. This view becomes more and more coherent and interrelated as the child develops (Smith, 1978; Miller, 1983 : 196).

Schemata are the reader's concepts, beliefs, and experiences, organized into structures in the LTM, that are used in making sense of things and actions. The new information, according to Piaget (Travers, 1982 : 116-171) can be added to the schema through two kinds of processes: namely; assimilation, an adding on system that is consistent with the data that is already organized within the schema, and accommodation, incorporating a new action within the schema, but at the same time modifying the schema to make it consistent with the new response. In reading, schemata are used to make sense of the text as the printed words evoke the reader's associated experience of past and potential relationships (McNeil, 1987 : 5; Miller, 1983 : 71).

In Piaget's view (Morgan et al, 1986 : 425-426; Miller, 1983 : 74-76) every organism strives toward equilibrium within the environment and equilibrium within itself (among cognitive elements). When assimilation and accommodation are in coordination so that neither one is dominant, equilibrium is achieved.

Teachers of reading are concerned with three kinds of schemata, namely, domains, general world knowledge and theoretic structures.

- * Domain specific knowledge of topics, or processes for teaching particular subject matter. Teachers of science, maths, social studies, and other content fields help pupils develop the background required for reading textbooks in a given field (McNeil, 1987 : 5-6; Miller, 1983 : 70-78).

- * General world knowledge - understanding general relationships, causes, and activities that are common to many specific situations and domains. General world knowledge allows readers to make appropriate inferences while reading and to identify with persons and events (Morgan et al, 1986 : 425-426; Mc Neil, 1987 : 6). Schemata for different subjects will differ, therefore the pupil will be able to learn better in a subject if he has acquired the schemata appropriate for that subject.

- * Knowledge of the theoretic structures and the conventions of organizing and signalling the organization of texts. The schemata for storing grammar and the patterns used in writing expository (explaining and making clear) text reduce the processing element of reading. Ideally, pupils will read for their own purpose, relate text to their own schemata, possibly modifying the text and their original schemata in the process. It follows that pupils who do not apply schemata appropriately are going to have trouble learning and remembering the information in the textbook, which may affect their achievement at school (Miller, 1983 : 78).

2.3.3 Types of comprehension

2.3.3.1 Language comprehension

Although a higher proportion of class time in language learning is needed to develop the ability of pupils to speak, comprehension of the spoken language cannot simply be left to take care of itself. The consequences of its neglect quickly show up outside the classroom, when the learners no longer understand what is said to them. In addition, Byrne (1976 : 9)

found that poor comprehension generates nervousness, which may inhibit the ability to speak that particular language. Language enables one to think more formally or abstractly. Language helps pupils to develop to the stage of formal operations by thinking more formally (Byrne, 1976 : 9).

2.3.3.2 Listening comprehension

Listening comprehension involves the encoding and meaningful organization of responses to what one hears. Listening comprehension follows almost the same process as information processing (see par. 2.2.4). In order to cope with the real life language situation, pupils need to be regularly and frequently trained through a programme of listening comprehension. Listening comprehension is essentially an active process. Listening to the mother tongue leads to effortless comprehension, due to experience. Those elements in the message which signal meaning in various ways are immediately identified or recognized.

In general, the situation for the second language learner is very different. The second language learner is not always skilled in that language and does not master the basic patterns of phonology and grammar which first language speakers comprehend so effortlessly. This situation prevails also in reading. Therefore the black matric pupil using English as a second language as a medium has to listen and read with much greater attention, as he finds it difficult to select and retain items of information in his memory and to arrive at an overall comprehension of learning content (Goldman, 1976 : 123; Byrne, 1976 : 9).

2.3.3.3 Reading comprehension

One reads to be informed, entertained, stimulated, and comforted. In order to attain these goals satisfactorily it is necessary to process much information through reading, and to process it with a reasonable degree of speed and a high degree of

accuracy (Lefton, 1985 : 76; Morgan et al, 1986 : 187). Reading is defined a "a complex process involving the perceiving of written meanings, the interpretation of meanings, and the reaction to and applying of meanings to life" (Hafner, 1967 : 40-47; Wilson and Gambrell, 1988 : 12). Reading is an active process from which the individual has to infer meaning and ideas from the printed page. The written symbols trigger off meaning according to their pattern, and the experience, intelligence and habits of inquiry of the reader, through a psycholinguistic process (Sahu and Devi, 1984 : 34). When pupils are reading, they may infer a certain meaning of a certain word from the context; or they may find that this word, which they already know in some other context, means something different in this context. Winograd & Niquette (1989 : 16) believes that this decoding process, involving comprehension is neglected in the classroom. This may be the cause of poor academic achievement at matric level.

2.3.4 Levels of comprehension

Pask (in Schmeck, 1988 : 97) notes that a surface approach to learning leads to what is essentially a literal reproduction of the words of a textbook or an instruction. The surface approach leads to non-perception of the total structure of information and disconnected bits and pieces that are memorized through repetition. On the other end of the continuum of levels of comprehension, we have what Pask (1988 : 64) calls a deep approach, which produces comprehension of the real meaning of what is to be learnt. A deep approach includes perception of the structure, as well as the hierarchical components of the learning material that is studied.

A number of researchers have shown that complete biconditional sentences (a link between two statements in logic that means if and only if) as well as certain types of anaphoric references (referring to a preceding word or group of words, use most effectively for argumentative statements) do not occur until early adolescence (Goldman, 1976 : 123; Morgan et al, 1986 : 76; Vrey, 1979 : 104), which is the stage at which the high school child finds himself. This is the

beginning of the stage of formal operations. As the child develops, his sentence construction improves with age. Goldman (1976 : 123) also states that as the child develops reading skills, his exposure to longer and sometimes more complex sentence forms increases, placing demands on his language comprehension system to understand and use these forms in his spoken and written messages. Most matric pupils have developed to the formal operational stage, that is, they are exposed to more complex sentences which place more demands on his language comprehension and learning, especially in second language learning, for example, English.

2.4 FACTORS INFLUENCING COMPREHENSION

If one intends to improve comprehension it is advisable to identify the factors exerting an impact on learning and comprehension. Klauer (1988 : 353) argues that in that way it is possible to bind those prerequisite factors accessible to teaching. He went on to schematize such a model of the prerequisites of learning and comprehension.

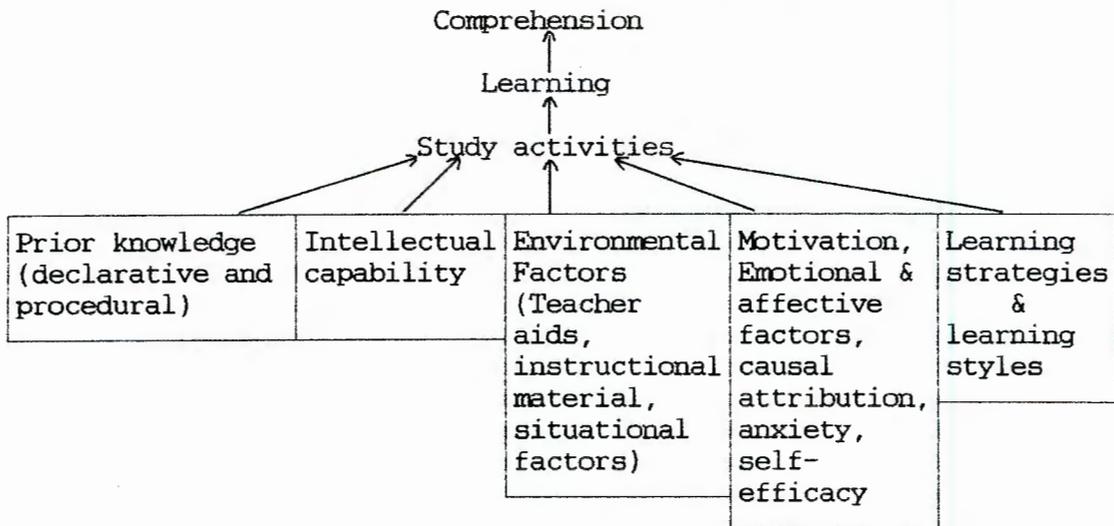


Figure 2.3. Factors influencing learning and comprehension (Klauer, 1988 : 353)

Learning, which may lead to comprehension, is conceived to be dependent on study activities, which in turn are dependent on five groups of factors, namely, prior knowledge, intellectual capabilities, environmental factors, motivation, and learning strategies and styles. These five groups of factors are not independent of each other but are

interwoven. For the sake of clarity, they will be discussed individually.

2.4.1 Prior knowledge

What is understood and stored in the course of comprehension discourse, frequently includes not only what is directly stated, but also what seems to follow from that information. Sometimes the operative background knowledge will not be general knowledge of the world, but specific knowledge of the language, like knowledge of English as a second language. Multiple meanings are very common in natural language. How does a pupil know how to endow a word with the appropriate meaning? The indication is that context and background knowledge determine this process. For example, the word "bar" has two meanings with little in common. When one is reading about a legal matter, bar is encoded as a lawyer's guild. When one is reading about entertainment, bar is encoded as a drinking place (Perfetti, 1982 : 34). The pupils should learn to encode appropriately by relating what they are reading in the text with the background knowledge they have built up during the reading process. In this research the encoding of appropriate meanings from the text, as a component of reading ability will be investigated to determine its relationship to achievement in English as a second language and other subjects at matric level.

Not every piece of background knowledge is equally able to enlarge the range of possible learning. If schemata instead of facts are taught, then the learning of material enriching the pre-established schemata is supported, that is, the range of immediately possible learning is specifically and predictably broadened which would not be the case if mere factual material were learned (Klauer, 1988 : 351).

2.4.2 Intellectual capability

Our knowledge of human abilities has broadened rapidly in recent decades, and is now substantial. Many cognitive and psychomotor abilities have been identified, for instance, intellectual ability, language ability and reading ability. It has also been established that abilities develop quite slowly over the years, but once developed,

enable the individual to deal with his social and physical world more effectively. Abilities, like reading ability, may influence the comprehension of the learner, hence teachers can use this knowledge about abilities to organize better instruction for individual pupils (Sternberg, 1985 : 1-4; Klausmeier and Goodwin, 1971 : 57).

2.4.3 Environmental factors

The numerous environmental factors that have been used in explanations of relationships between family background and school achievement can be divided into status variables, and process variables (Scott-Jones, 1984 : 267). Status variables are those that are used to label or characterize families, for example, the doctors child. Process variables are more specific, direct measures of the environment. These variables include what people actually do and what they think, feel, and value. The nature of the physical setting in which the family lives may have an influence on the child's cognitive development and school achievement. The environment in the classroom, for example, the teaching and learning aids that the teacher and the pupils use to make learning effective, instructional materials, and teacher-pupil relationships also have a positive influence on the comprehension of the child (Scott-Jones, 1984 : 268).

2.4.4 Motivational factors

Another factor influencing comprehension encompasses those aspects of personality that have to do with emotions, attention and anxiety. Motivation includes the process of arousal, expectancy, and incentive. Pupils who are motivated are able to pay more attention to what they are reading, and are more anxious to know and understand what they are reading than pupils who are less motivated (Keefe, 1986 : 9). Optimum attention is ordinarily an intermediate level between boredom and excitement. Arousal involves traits such as curiosity, explanatory behaviour, boredom, anxiety, and frustration (Keefe, 1986 : 9).

"Motivation is a state of arousal or excitement that causes people to act" (Clifford, 1981 ; 349). We often hear remarks like 'Pule is doing lousy in school and has little or no motivation' or 'Dikelechi has never

been more motivated and it shows in her performance'. Such remarks imply that the more motivation the better the performance, but there is a point at which an increase in motivation begins to harm performance. For example, too much excitement during a test can cause almost as much harm as a total lack of concern with test results. This relationship suggests that teachers and pupils work toward setting an optimum, rather than a maximum, level of motivation (Gagné, 1985 : 309; Clifford, 1981 : 349; Biehler and Hudson, 1986 : 522). In this study an atmosphere that encourages pupils to develop the motive to achieve better and reinforces their efforts to reach self-imposed goals was provided.

2.4.5 Learning styles and learning strategies

2.4.5.1 Learning styles

Keefe (1986 : 5) defines styles as "characteristic cognitive, affective, and psychological behaviours that serve as relatively stable indicators of how learners perceive, interact with, and respond to a learning environment". Learning styles have cognitive, affective, and physiological dimensions.

- * Cognitive styles are "information processing habits representing the learner's typical mode of perceiving, thinking, problem solving, and remembering" (Keefe, 1986 : 7). Each learner has preferred ways of perception, organization, and retention that are distinct and consistent (Lundberg, 1987 : 408; Brown, 1984 : 213).

- * Affective styles encompass those aspects of personality that have to do with attention, emotion, and values. A learner strives for whatever he desires greatly (valence) and has high hopes of success (expectancy). Achievement motivation (the motive to achieve) is an example of both expectancy and satisfaction in mastering challenging tasks (Keefe, 1986 : 9). The teacher should try to motivate pupils to achieve well. A motivated learner is a learner who strives, by means of comprehension, to master a

learning task to such an extent that he will be able to use the learned strategies and content in other tasks.

- * Physiological styles relate to behaviours of the human body. Physiological styles are "biologically based modes of responses that are founded on sex-related differences, personal nutrition and health, and accustomed reaction to the physical environment" (Keefe, 1986 : 13). Physiological factors are among the most evident influences in the process of school learning. The pupil who is hungry, ill or malnourished behaves differently from one who is healthy because of a physiological imbalance. Therefore hunger affects the learning process of the child at school negatively.

2.4.5.2 Learning strategies

Educators at all levels have been increasingly concerned about generalizable cognitive skills such as those necessary for learning, problem solving, and critical thinking. Obviously, the subject matter content the pupil already knows when taking on a task will influence his performance (McKeachie et al., 1986 : 24). But we need to know how pupils acquire and modify their knowledge and skills, that is, which learning strategies they use. McKeachie et al. (1986 : 24) defines learning strategies as "thoughts and behaviours that a learner engages in during learning and that are intended to influence the encoding process". The learning strategies which may influence comprehension are classified into the following categories:

- * Cognitive strategies include strategies related to pupils' learning and encoding of materials as well as strategies to facilitate retrieval of information (see par. 2.2.4). The basic cognitive strategies include rehearsal, elaboration, and organizational strategies (Spiro, 1980 : 451; McKeachie et al, 1986 : 25). If cognitive strategies can be learned and used to facilitate retrieval of information, then comprehension and achievement can be improved.

* Metacognitive strategies. A great deal of research supports the importance of metacognitive development and academic learning (Paris and Winograd, 1989 : 2). Interest has shifted from the mere study of skills to the study of knowledge about skills, or metacognition. Metacognition is concerned with the "processing of thinking" (Lundberg, 1987 : 408), or the awareness of, knowledge about and control and regulation of cognition. Awareness refers to the knowledge about the self in term of cognitive performance, for example, knowing that you are a fast reader, a poor writer, etc. This knowledge will influence achievement in class positively (Anstey and Freebody, 1988 : 201). Metacognitive strategies falls into two categories; namely, regulation of knowledge which involves consciously manipulating one's cognitive strategies by planning, monitoring, and checking one's thinking processes, and knowledge about cognition or being aware of how cognitive strategies are regulated, by thinking about thinking (see par. 4.8). When a person reads, he should be consciously manipulating his cognitive strategies by planning, monitoring, checking, and thinking about his reading processes. Matric pupils should be able to manipulate their cognitive strategies in such a way that what is learned in one subject, English for example, can be applied in another subject like History.

* Resource management strategies include a variety of strategies that assist pupils in managing the environment and the resources available. These resources include the time available for studying, the actual study environment, and others such as peers and teachers, as well as learners themselves. These strategies help pupils to adapt to the environment as well as to change the environment to fit their needs. Time management for example, is an important self-management activity in studying (McKeachie et al, 1986 : 28). Pupils need to manipulate the resources available to them in order to achieve better at school.

2.4.6 The teaching of learning strategies

- * Making the learner aware of the strategies used: The first step is rendering the pupils aware of their learning strategies by the different techniques of verbalizing and self-reflecting (Klauer, 1988 : 358). The main purpose is to direct the pupil's attention to his or her own way of dealing with the learning objective instead of dealing with the learning objective (Klauer, 1988 : 358; Palincsar, 1986 : 122). Training of strategies is a critical affair that should not be put in use schematically (Klauer, 1988 : 357). Pupils should be made aware of the strategies they are going to use during the reading programme. They should be given the background knowledge of the strategies, and that if they are correctly used they might improve their academic performance. The pupils should be informed about learning strategies, about the nature of the available strategies, their advantages and disadvantages and about when to use which one (Klauer, 1988 : 358). Caution seems to be advisable when informing pupils about a new strategy in order not to confuse them.

- * Semantic training: Pupils should be provided with a series of tasks arranged in such a way that working through the series suggests the application if not even the acquisition of a certain strategy (Klauer, 1988 : 357). Derry and Murphy, (1986 : 26) believes that executive skills (learning strategies) cannot be trained easily or by direct instruction alone, but should be developed gradually and automated over an extended period of time.

- * Demonstration of the learning strategies by the teacher: The teacher should provide pupils with a great deal of adequately sequenced practice and demonstrations using tasks from all relevant fields. The aim is the teaching for transfer of the strategy into all relevant areas of application whereby the ecological validity of the teaching programme is guaranteed and as well as the automatizing of the strategy in question so that the pupils will be able to perform it without inappropriate

volitional effort and control (Klauer, 1988 : 358).

- * Rewards for using strategies: Pupils also need to be informed about the rewards for using strategies. The use of such frequent and direct measures enables the teacher and pupils to evaluate the success of the strategy and their efforts (Palincsar, 1986 : 122). Pupils must experience success in the use of strategies.
- * Pupils must be able to recognize and understand feedback of their performance and then be able to act on it to improve their performance (Palincsar, 1986 : 123).
- * Academic achievement will be improved by curriculum which complements learning strategies and instructions. The learning task should specify the learning strategy (Mayer, 1989 : 44).
- * It is important for teachers to make a follow up to the strategies taught to pupils to find out whether they are still using those strategies. There is a tendency for pupils to go back to the old reading method after the experiment, hence the importance of a follow up by the teacher (Palincsar, 1986 : 124).
- * The teaching of learning strategies should start as soon as possible because novices gain more by the teaching of learning strategies than the experts (Mayer, 1989 : 44).

2.5 SUMMARY

To teach a child at school, it is necessary to examine the fundamental aspects of comprehension and learning that are applicable to all pupils, and indeed to teachers themselves. The basic assertion is that effective and meaningful learning occurs by relating new experiences to what one knows, or believes, so that it leads to comprehension.

In this chapter learning has been defined as a change in or modification of existing patterns of behaviour, which influences future performance and comprehension. Comprehension has been defined as a mental grasping of related facts or a psychological conceptualization.

Comprehension means relating new experience to the already known. Pupils try to make sense of the world by relating their experiences to the theory of the world in their minds, a theory they have been developing since birth. The theory manifests the summary of experiences in the memory. It is the framework within which pupils will try to interpret new events and constitutes their expectations for the future. Thus it is fundamental for learning (Fig. 2.4).

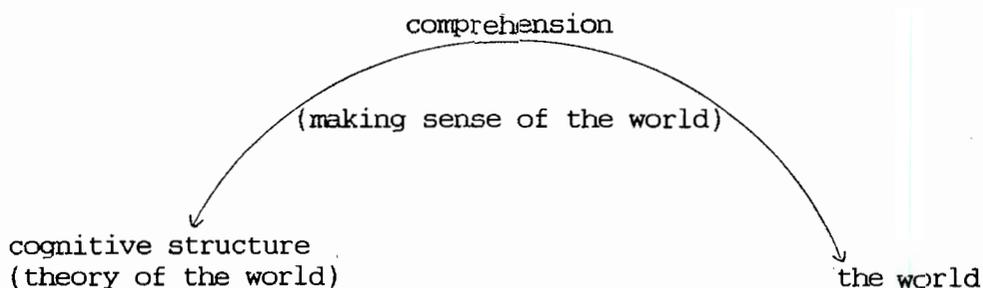


Figure 2.4. Making sense of the world (comprehension).

Figure 2.4 is a simplified diagrammatic representation of how the cognitive structure or the theory of the world in the mind, is related to the world around us. Anything in the environment that can be perceived or interpreted in the light of the contents of the cognitive structure may make sense. Cognitive structuring, in effect, imposes meaningfulness upon the world.

For many pupils reading is the one skill often used to interpret the world when they have left the classroom. The pupils need strategies and styles in order to be able to apply this skill in life. Reading is more than assigning language sounds to the written words, it requires the comprehension of what is written. Pupils differ in their abilities to read their second language, and to read content subjects. In the next chapter (chapter 3) the nature of reading ability and the role of the second language will be looked into, to see how it affects the achievement of pupils at the matric level.

CHAPTER 3

3 READING ABILITY

3.1 INTRODUCTION

A pupil's reading ability in a particular language is a prerequisite for his success at school. Good achievement in English, for example, tends to improve the learning of other subjects which are taught through the medium of English. It is therefore not surprising that reading ability has been the focus of so much research. Relationships between reading and other skills such as scanning and scheming have been explored and factors determining reading proficiency have been examined in an effort to find better ways to teach pupils to read with comprehension (Edu, 1973 : 229). In this chapter human abilities, with special reference to reading ability, will be discussed, after which reading, its components, strategies and styles will also be discussed to gain some background knowledge of reading ability. Special attention will be given to metacognition and the monitoring of reading during the learning process.

3.2 HUMAN ABILITIES

3.2.1 Definitions and description of the concept ability

Information on human abilities has grown rapidly in recent decades, and many cognitive and psychomotor abilities have been identified. Ability is typified as "all the psychological conditions needed to perform an activity" (Encyclopedia of psychology, 4 : 267). Ability is therefore operationally defined by the activity with which it is associated. The term ability also refers to "the power and the skills, especially of the mind" (Longman dictionary of contemporary English, 1986 : 2). Specific to the reading process, ability refers to the power of the mind to derive meaning from the printed words and the skillful application of the derived meaning.

Ability is the key term used in psychometric and information processing

approaches to the study of intelligence. Ability refers to an attribute, such as intelligence on which an individual displays relatively stable differences. The ability concept is also used for the explanation of the existence of relatively enduring individual differences such as the power to memorize (Lewin and Allen, 1976 : 33; Sternberg, 1985 : 8-19). The first notion relates to the legitimacy with which the reading task can be said to be an index of a particular ability, and the latter to the assumed causes for individual differences in reading processes. Teachers can use information about abilities to improve learning and, ultimately, also the achievement of pupils in general at schools. Abilities could also be misused by teachers by suppressing pupils' abilities, hence the need for clarification on abilities and their uses in this investigation.

Some abilities are inherited and inborn, while others are environmentally determined. Simplistically put, inherited abilities, like intelligence, are determined during the time of conception, while environmentally determined abilities, like reading, are determined by the environment of the individual. Abilities develop quite slowly over the years, but once developed, enable the individual to deal with his social and physical world effectively (Klausmeier and Goodwin, 1971 : 57).

Most abilities are cognitive or psychomotor, while some abilities involve elements of both. Word comprehension is a cognitive ability, while eye movement is a psychomotor ability. Therefore reading is both a cognitive and a psychomotor ability. A young child, for example, learns English words and their meanings and then is able to understand what others say. The child has acquired a cognitive ability which means that he understands certain content like English words. When the child reads, his eyes have to move in a particular pattern over the page; that is, the eye movement has to be developed.

In recent years marked advances have been made in identifying and classifying human abilities (see par. 3.2.4). As individuals differ not only genetically, but also environmentally, not all pupils have the same abilities. Teachers can use their knowledge about abilities to organize instructions for individual pupils during their learning

processes by showing them individual reading strategies and styles (Klausmeier and Goodwin, 1971 : 58).

3.2.2 Views on abilities

The identification of abilities by scientific methods is a complex process that appeals to many psychologists. Teachers use and, unfortunately and unintentionally may even misuse information about abilities. The nurturing of abilities is one of the main objectives of education and takes many years to accomplish. A considerable part of the difficulty of arriving at a meaningful cross-linkage between learning processes and abilities may be based upon the fact that dissimilar criteria are being applied to learning tasks on the one hand and cognitive abilities on the other hand (Lewin and Allen, 1976 : 33).

The psychometric approach, like that used by Spearman, sought to understand abilities largely in terms of factors, or mental structures, believed to be responsible for individual differences in observed performances on the intelligence tests and in academic and other kinds of work (Thomas & Rohwer, 1988 : 30). Information processing psychologists were dissatisfied with the emphasis on structure in the psychometric approach. Information processing psychology seeks to study the mind, in general, and intelligence, in particular, in terms of mental representations and processes that underlie observable behaviour. The most essential aspects of the ability concept, such as the number of abilities and their psychological interpretation, cannot be explained within the psychometric framework only (Sternberg, 1985 : 2). In this study the observable behaviour would be the achievement of matric pupils and the strategies used to obtain that achievement.

The methods that have emerged from information processing research are quite different from many of the methods that have emerged from the psychometric study of abilities. For example, psychometricians have started their investigations of human abilities with the study of differences among people, but information processing psychologists have started their investigations with the study of how people perform on tasks; only then have they sought to look at individual differences in task performance. Whereas psychometricians might be content to

identify "a factor (structure) of human reasoning, information processing psychologists would seek to identify the processes which underlie human reasoning" (Sternberg, 1985 : 2).

There are also some similarities between the psychometric and information processing studies of human abilities. Both psychometricians and information processing psychologists have investigated what it is that gives rise to observable individual differences in task performance. Both types of psychologists have attempted to construct theories of just what the basic human abilities are, and how they are manifested in task performance. Both views on abilities are therefore valuable for use in investigations of factors influencing academic performance (Sternberg, 1985 : 2). In this chapter reading ability will be considered from the psychometric and information processing points of view to find its relation to the achievement of matric pupils in English, Biology and History.

3.2.3 Attributes of abilities

In a comprehensive review of research on human abilities, Fleishman and Barlette (in Klausmeier and Goodwin, 1971 : 59) identified five important attributes of human abilities, namely:

- * Abilities are the products of maturation and learning. Much practice and learning are required, for example, to speak English well and apply its principles well in other subjects, for example, Biology. The stage of development of the individual limits what he can learn. Thus, abilities develop at different rates from birth through adolescence. Verbal comprehension, for example, develops more rapidly in early childhood than arithmetic reasoning.
- * Abilities developed during the formative years persist into adulthood. For example, manual dexterity is quite stable from year to year; it is resistant both to improvement and degeneration in adulthood.
- * The present abilities of the individual affect the rate at which

he learns new tasks. Thus, the present reading ability of a pupil in English as a second language may affect what he learns in English and Biology and therefore affects his achievement in other subjects at the matric level.

- * One ability may be transferred to the learning of a greater variety of specific tasks than other. That is, abilities may vary from specific to general and the more general the ability the greater its transfer is. If a child, for example, has a high reading ability in English, this reading ability in English may be transferred easily to other content subjects which are done through English as a medium of instruction at matric level.

- * Abilities are more fundamental than skills. The term skill refer to the level of proficiency on a unitary task or a configuration of tasks. Driving, swimming, flying an airoplane, or playing chess, are all skills required at varying levels of proficiency.

An ability, or configuration of abilities, such as speaking English fluently, is a mediator that accounts for consistencies among separate performances. Thus the ability to speak English fluently or well underlies the many separate encounters and experiences one has with others who speak English. In this sense, the ability mediates or helps the individual to interpret the ideas and actions of others and also helps him to take action based on what they say (Klausmeier and Goodwin, 1971 : 59-60).

3.2.4 Types of abilities

- * General intellectual ability. When we talk about intelligence, we imply that there is one principal kind of cognitive ability. It sounds wrong to speak of 'intelligences' in the plural. Admittedly we can talk of different 'kinds of intelligence', but we still tend to imply one over-riding capacity which can manifest itself in different forms, rather than separate, non-overlapping skills. The idea of one dominating intellectual trait is very widely accepted (Sternberg, 1985 : 3-5).

Different people are likely to agree fairly unanimously on who the bright people in their school, work group or social circle are. There are, however, wide variations in lay people's definitions of intelligence. Psychologists, too, differ from one another in their definitions of the concept "intellectual ability". To illustrate these differences in the definitions of the concept "intellectual abilities" mention will be made of a few theories of intelligence from two different groups of theorists (Morgan et al, 1986 : 524-534 and Butcher, 1977 : 44-47). One group consists of the theorists who have studied the organization of mental ability. Their primary interest is in identifying the factor or factors which constitute intelligence for example the G-factor (use of general factor affecting all mental operations) theory by Charles Spearman, multifactor theory by L.L. Thurstone and J.P. Guilford, and the hierarchical theory of Vernon. The theories that have emerged from these efforts are called factor theories. Intelligence from this point of view consists of factors or structures of the mind.

The second group of theories has focused not only on the component part of the intellect but on the processes involved in intellectual activity, such as the processes involved in solving problems or planning how to remember something. Piaget's, Bruner's and Robert Sternberg's theories for example, distinguish between information processing "components" and "metacomponents". Components are the steps through which one progresses to solve a problem; metacomponents consist of the kind of knowledge one has about how to solve a problem (Morgan et al, 1986 : 528; Sternberg, 1985 : 3-5). The results of their efforts have been a group of process oriented theories of intelligence, learning and reading.

* Verbal ability. There is a psychological dimension of ability associated with the comprehension of language. Verbal ability is characterised by being able to express oneself in words, either orally or graphically and it involves comprehension (Sternberg, 1985 : 54). Comprehension is a complex process, composed of many subprocesses (see chapter 2). These range from automatic,

involuntary acts of lexical identifications to the planned strategies people use to extract meaning from lengthy texts. They combine to produce "verbal intelligence" (Sternberg, 1985 : 55). Verbal intelligence is the power to extract meaning from written and spoken words. A person's vocabulary size is one of the best indicators of other aspects of verbal ability. General verbal intelligence is also correlated with ease in the use of words. Skilled readers and listeners recognize common words automatically as compared to unskilled and second language readers, because their vocabulary may be better than the weaker readers (Sternberg, 1985 : 55).

* Second language ability. This refers to the abilities required by children and adults to learn a second language in some relatively formal situation, usually, a course of training in the second language at school. Around the world, most children have little difficulty learning to speak and understand whatever language happens to be their mother tongue, because they have acquired it since birth. Up to about age six or seven, they also have little difficulty learning a second or even a third language if that language is used in their immediate environment, such as their home or their playground. In the case of Black children, English is learnt at school and it is not used in their immediate environment, hence this affects their academic achievement negatively. In these formal learning situations, pupils appear to differ in ability for second language learning. A few fortunate individuals learn a second language quite easily and rapidly, but most pupils seem to have much difficulty, and take a long time to acquire anything like native language proficiency. There appear to be some people who have so little aptitude for second language learning that they never approach real success even if they are highly motivated and give serious efforts to learning (Sternberg, 1985 : 53-88; Kagan and Lang, 1978 : 411-418).

* Reading ability is an ability to decode and understand written symbols (see par. 3.3.1). There are different ways in which people vary in reading ability. Among high school and college

students, a reader of high reading ability may be one who reads silently at a high rate with comprehension while a reader of low ability may be one who reads slowly with less comprehension. We would also expect the high ability reader to achieve "critical" understanding of the text, to gauge the author's persuasive purpose and to understand extensions or applications of the text. A high ability reader is expected to read with comprehension as well, but the emphasis would be on word decoding (Perfetti, 1982 : 3; Sternberg, 1985 : 68). At high school level, comprehension increasingly becomes the main criterion for reading ability. It is expected that pupils with a high reading ability should be able to decode and understand text easily in order to achieve good results. The problem is that in Black schools some pupils might not have this high reading ability in English as a second language. In this investigation one wants to see if there is any relationship between this reading ability in English as a second language and the achievement in English and other subjects at matric level by the teaching of some reading strategies (see par. 3.8).

- * Problem solving ability is a complex cognitive skill that is a characteristic of intelligent human activities (Seifert, 1983 : 32). From childhood onward, problems presented by the world are actively solved. Acquired information is arranged into structures of knowledge about the objects, events, people, and the self that are stored in the memory system (see par. 2.2.2). These structures of knowledge comprise bodies of understanding, mental models, convictions, and beliefs that influence how experiences are interrelated, and how problems are solved in school, in jobs, and at play. (Klauer, 1988 : 117-140, Sternberg, 1985 : 227; Seifert, 1983 : 32).

3.3 READING

The first grader, stumbling aloud through "run, sport, run" and the matric pupil, silently studying this sentence, are both said to be reading. Clearly, there are long years of experience and skill separating the two performances. There is a different purpose in each

case as well; the first grader is practising reading itself, whereas the matric pupil is putting reading to use in getting information, that is, in his learning process. Common to the two processes or actions, however, is this: Both readers are translating written symbols into that form of language from which they have already derived meaning (Mosenthal, 1985 : 119). The matric pupil may accomplish this information with greater sophistication and swiftness, and may so practise integration of that information; but the translation or decoding process stands at the core of reading. Klausmeier and Goodwin (1971 : 252) believe that this decoding process must be learned in early school years and later shaped to a variety of purposes such as learning other subject matter, skimming news paper headlines, looking up names in the telephone directory, amusing oneself with a murder story, or reviewing a recent research report in one's field.

3.3.1 What is reading?

In this investigation reading will be observed from an educational perspective as well as from a learning point of view. Mosenthal (1985 : 110) found the following interpretations of the reading phenomenon:

- * reading leads to the ability to answer a teacher's questions about what is written in the text.
- * reading is the pupils' ability to decode, using knowledge of phonics.
- * reading leads to the ability to revise hypotheses and make use of prior knowledge.
- * reading leads to the ability to do well on standard tests.
- * reading can be done critically to monitor one's own comprehension.
- * reading depends upon the pupil's visual acuity, his visual skills and efficiency, and his visual peripheral motor development.

Reading is thus something more than can be defined by a single definition. There is a variety of definitions reflecting different perspectives. The description of reading in this study should be able to reflect reading from the educational and learning points of view.

Learning to read can be defined as learning to translate from written symbols, that is, the written system, or orthography of the language, into that form of language from which the pupil already derives meaning, most often, the spoken language (Klausmeier and Goodwin, 1971 : 252). Reading is thus the process by which information is acquired from a written text. Because writing is a code language, all the skills that a person has for understanding a spoken language can be used to understand text. There is one additional requirement for reading, namely, decoding. Whereas language is auditory, reading is visual; "it is translation from seeing to hearing" (Edu, 1973 : 229). In this investigation reading will be defined as the pupil's ability to decode words, using his knowledge of phonics and monitoring his own comprehension (Mosenthal, 1985 : 110).

3.4 THE DEVELOPMENT OF READING RESEARCH

The history of reading research serves as background knowledge for the study of reading ability in English as a second language. The history of research on reading is for the most part the history of cognitive psychology, starting with Wundt's laboratory in Leipzig in the late 1870's, and continues to the present day. According to Pearson (1984 : 8) the most controversial issue on reading concerned the nature of perception during reading, especially the question whether perception occurred while the eyes were moving. Cattell's studies (Pearson, 1984 : 10) established that the field of distinct vision and the perceptual span were different entities, the latter depending upon the subject's ability to group stimuli into larger units.

A major controversy centered on the cues for word perception. Edman and Dodge - as early as 1898 (Pearson, 1984 : 10) - demonstrated that words could be read at a distance at which their constituent letters could not be identified, that is, words as a whole are identified even when component letters cannot be identified. In general, German psychologists support the view that word recognition was mediated by letters and letter grouping, while American psychologists argued for the total form. The present research on reading puts more emphasis on the flow of information from the printed page until it is stored in the mind, that is, information processing (Pearson, 1984 : 10).

3.4.1 The psychology of reading

Research related to reading, from a psychological point of view, has a long history; it began a hundred years ago with James McKeen Cattell, who undertook pioneering work in the field of the psychology of reading when he went to study with Wilhelm Wundt in Germany in 1880. He began investigating how people read by studying "how words and letters are recognized by adults" (Travers, 1982 : 362). He must have realized that reading is more than a matter of mere letter and word recognition and that it involves complex processes of comprehending ideas. Cattell first showed that two letters could be read almost as quickly as one. Then in a latter series of studies, he showed that the reader could grasp at a glance three or four words that form a sentence. He interpreted those findings as demonstrating that a person could grasp only a certain amount of information at one time. In the modern psychological terms we would say that the perceptual system (short term memory) has a limited capacity for information (Pearson, 1984 : 11).

In the 20th century the standardized achievement testing techniques were developed and these gave research workers the opportunity to explore the conditions that lead to the efficient learning of reading. The first point to make is that learning to read is highly dependent upon aspects of language development (Travers, 1982 : 363). One could readily understand that a child who is guessing a word, which he cannot read, is likely to make a better guess once he has a good vocabulary from which a guess can be drawn. A pupil who is fluent in English as a second language obviously has an important advantage in learning to read. A pupil who is fluent in English as a second language has also mastered a set of rules that prescribe how a sentence can be constructed. Such a set of implicit rules also indicates what can and what cannot appear on the printed page (Travers, 1982 : 363).

3.4.2 Directions in the sociolinguistic study of reading

In the last decade, a new conceptualization of reading has emerged, which is based on the recent theory of sociolinguistics and the ethnography of communication. From this perspective, Pearson (1984 : 395) views reading not only as a "social and linguistic process" but

also as a means of communication. As a social process, reading is used to establish, structure, and maintain social relationships between and among people. As a linguistic process, reading is used to communicate intentions and meanings, but also between people involved in reading events. According to Au and Mason (Pearson, 1984 : 396) there are two directions in the study of the sociolinguistic nature of reading, namely, cognitive activity and linguistic processes. In the first direction, reading is viewed as a cognitive activity embedded in social and linguistic contexts. The social and linguistic contexts influence the nature of the cognitive process involved in reading, for example, the child who lives in the society that practises witchcraft will always think of it when reading something on dry bones. This could well be true for the pupils in this study who are from a black society with its linguistic and social influences. In the second direction, the research have viewed reading itself as a social and linguistic process. Within this second direction researchers have been concerned with how reading and literacy in general, are part of the process of culture transmission and socialization (Bloome, 1981 : 16; Hymes, 1981 : 27; Pearson, 1984 : 399).

3.5 COMPONENTS OF READING

Edmund Burke Huay, who published the first comprehensive account on reading, could perceptively observe that a complete theory of reading involves a description of "very many of the most intricate workings of the human mind" (Perfetti, 1982 : 3). Reading is both simple and complex. It is, at the same time, both cognitively trivial and so difficult that failure at learning to read is common, because it is made up of several components (Kagan and Lang, 1978 : 400; Perfetti, 1982 : 3). In order to explain reading, the different aspects or components will be dealt with separately.

3.5.1 Word recognition

The first obvious component of reading is the recognition of words. For example, in the sentence, 'Marvin asked his brother to lend him five rands', 'Marvin', 'asked', ...etcetera, must be associated with familiar concepts represented in the long term memory.

These representations include names of persons - 'Marvin' - general concepts - 'ask', 'brother' - and referring devices, or anaphorah, 'his'. In each case, they also include information about how the word is pronounced. Since these recognition processes involve access to mental representations of words, that is, schemata, this general component is referred to as lexical access (Perfetti, 1982 : 4; Rahman and Bisanz, 1986 : 323; Pearson, 1984 : 259).

3.5.2 Decoding

The psycholinguistic definition of reading implies several kinds of information which the pupil might profitably bring to the first grade. Learning to decode the printed word requires either "the noting or association of a vocabulary word with its printed configuration" (Klausmeier and Goodwin, 1971 : 252), or association of sounds of English words with letters most often representing those sounds. Letter associations (called letter - sound correspondences) allow pupils to sound out new words and to discover matches with their oral language. Such learning greatly reduces the load of the working memory imposed by the whole-word decoding method. Either form of learning, however is dependent on skills such as eye movement, which the pupils must bring to the learning or reading task to acquire decoding in the process. Letters or letter configurations should be recognized as the same or different for decoding to take place. The spoken words that pupils should associate with the printed words are usually already available. The English language, however, contains letters or combinations of letters that stand for different sounds (for example, a, e, i, o, u, can have different sounds in different words). The pupil who learns to read English as a second language, consequently encounters problems that are not encountered by pupils learning to read some other languages which are written more phonetically (Kagan and Lang, 1978 : 411). The pupils in this investigation also have to learn to decode text in a different way than in their mother tongue, Setswana.

3.5.3 Comprehension

Another component of reading is comprehension which is a set of

interrelated processes (see par. 2). These intricate comprehension processes entail propositional encoding, propositional integration, and text modelling, which includes the process of constructing the overall meaning of a text. The local comprehension processes are those that allow comprehension of isolated sentences and sentence pairs. Text modelling processes use the outcome of local processes to build a larger representation of extended text. Reading comprehension deals with acquiring information from context and combining elements into a new whole. McNeil (1987 : 1) says that "it is a process of using one's existing knowledge to interpret and arrive at one's own construction of what the text means". The existing knowledge is the schemata by which the reader's concepts, beliefs, and experiences are used in making sense of things and actions. In reading, schemata are used to make sense of the text as the printed work evokes the reader's associated experiences and past and potential relationships (McNeil, 1987 : 5-6; Morgan et al, 1986 : 425-426; Pearson, 1984 : 269). Comprehension forms one of the important aspects of reading because pupils read to comprehend and link what they are reading to their existing knowledge.

3.5.4 Language

Language is the main component of reading because the central processes of reading are essentially mental operations on linguistic structures that begin with visual input. Although visual processes and linguistic processes have to be taken into account, the linguistic process may turn out to be especially important for reading ability because printed words form part of language (Pearson, 1984 : 396). The linguistic part of reading is emphasized for two reasons. The main reason is that reading includes both cognition and comprehension of words. Reading comprehension processes are essentially translations of visual objects into linguistic symbols. A second reason emphasises that a theory of reading ability should account for linguistic aspects of reading because differences in reading depend on its linguistic components (Perfetti, 1982 : 4). These two reasons make language an important component of reading.

3.6 FACTORS INFLUENCING READING

3.6.1 Biological factors

A number of authors have suggested that early cognitive development contributes to reading development (Williams and Silva, 1985 : 159). The intellectual characteristics of the parents, such as their intelligence and reading ability, are also related to the pupils' cognitive development and academic achievement.

Reading readiness of young children illustrates how maturation and experience co-operate to provide an optimum time period or a stage when pupils will be most receptive to reading instruction. A three-year-old child can perceive the differences among the letters of the alphabet and can understand symbols. Reading, however, involves more than discriminating distinctive aspects of the letter or thinking symbolically (Kagan and Lang, 1978 : 193). The pupils must also appreciate that the printed words stand for a sound that represents a familiar event or object in his world. This factor, representational meaning, which is the facet of reading readiness, will be manipulated in this study to increase reading ability. This aspect matures a little later, around four or five years of age. The pupils who are involved in this study are biologically mature.

3.6.2 Psychological factors

Psychological factors are demonstrated by the confidence and beliefs pupils have in their reading ability and this influence factors such as prior knowledge and familiarity of words. First, elementary as it may seem, pupils need to know what a word is. Adults can recognise the difficulty from their own experience of listening to an unfamiliar language. In uninterrupted sounds, it is difficult to tell where one word ends and the next one begins. To young children, their own language may seem like a continual river of sounds and the short momentary breaks that they hear do not correspond to the words themselves.

Consider the task of the pupil who already knows the names of all the letters of the alphabet. He must analyze and combine those letters into a sound he knows. Suppose the word is 'dog'. When he analyzes

the sound of each letter, he will come out with du-oh-gu, which is a three - syllable word bearing little relationship to the word 'dog' (Kagan and Lang, 1978 : 415). He can say du-oh-gu over and over again, and still fail to recognize the word on the page.

Learning to read individual words, not just identifying separate letters, is the most common problem for beginning readers, as well as for pupils at matric level who are studying English as a second language. Even if the pupil does not know how to spell a word, but is familiar with its sound and meaning, he will have an easier time blending the separate syllables and letters into correct sounds than if he has not heard the word before or does not know its meaning (Kagan and Lang, 1978 : 419). If a pupil hears the separate syllables of two-, three-, and four syllable words with a delay in between each syllable - like po-ta-to, he has no problem in recognizing the word, even if there is a seven seconds delay between the syllables. But this is true only when the word is familiar to the reader. If it is a word he does not know - either a nonsense word, such as 'ilgup' or a new word he has never heard, such as 'national' - he has great difficulty in recognizing the word these syllables form. Hence, a pupil's prior knowledge of words in any reading exercise is a critical factor.

3.6.3 Linguistic factors

Linguistic factors are concerned with written and spoken language. Kagan and Lang (1978 : 411) found that some psychologists have suggested that because the English language contains letters or combinations of letters that can stand for different sounds, the pupils who learn to read English encounter problems that are not encountered by pupils learning to read some other language for example, Setswana. Unquestionably, the English writing system is a challenge. Any language that pronounces 'caught' and 'fought' similarly, but spells them differently, should be expected to generate great problems.

The relationship between written and spoken language is most clear when the topic of spelling is considered. Simplicity in both reading and spelling depends on correspondence between the way sounds are written and the way they are pronounced (Edu, 1973 : 230). Ideally, anyone

able to pronounce a word and who is familiar with the sound associated with each letter would be able to spell it. English words are not always associated with their sounds and this may create problems for Black matriculants for whom English is a second language.

By the first grade a pupil is familiar with his mother tongue and the teacher assumes that he can transfer what he knows about the language to reading. However, the first and the major task unique to reading is that of learning how the written symbols relate to language. Realizing that the English language permits only some combinations of letter - sound sequences and prohibits many others, has stimulated much research on word identification (Edu, 1973 : 203). Compare, for example, the word 'glurck' and 'kculg'. Those who speak the language are prepared to identify the first but not the second as a possible English word, because the former, unlike the latter, is composed of letter-sound sequences that appear in English (Edu, 1973 : 235). In addition, the first word can be easily pronounced, but the second can be pronounced only with some difficulty, and no two people are likely to give the same pronunciation. Black pupils may have the same problem in reading English as a second language.

3.6.4 Metacognitive strategy training

The current explosion of research in second language reading has begun to focus on, among other things, readers' strategies as a relevant factor influencing reading.

Reading strategies are of interest for what they reveal about the way readers manage their interaction with the written text, and how these strategies are related to reading comprehension. Several empirical investigations have been conducted into reading strategies and their relationships to successful and unsuccessful second language reading (Hauptman, 1979, Devine, 1984; Hosenfeld, 1977; Sarig, 1978 in Carrell, Pharis, and Liberto, 1989 : 648). More recent studies have begun to focus on metacognition, literally, cognition of cognition (Jacobs and Paris, 1987 : 257-259; Kirby, 1984 : 90). These studies investigate metacognitive awareness or perceptions of strategies, strategy use, and reading comprehension (see par. 3.8.2).

Strategy research suggests that less competent learners are able to improve their reading through training in strategies evidenced by more successful learners. The same is true of reading strategies : less successful readers are able to improve their reading ability through training in metacognitive strategies used by more successful learners. (Kirby, 1984 : 91) Hence, in this investigation pupils were taught and trained in strategies with the aim of improving their reading ability in English as a second language that could lead to better achievement in English and other subjects learned and taught through the medium of English.

3.7 READING PROBLEMS

The central processes of reading are essentially mental operations on linguistic structures that begin with visual input (Perfetti, 1982 : 5). Although visual processes and linguistic processes have to be taken into account, the linguistic processes may turn out to be especially important for reading ability. The linguistic part of reading is emphasized for two reasons, that is recognition of words and comprehension. Comprehension processes are essentially manipulations of linguistic objects rather than visual ones. Word recognition processes are essentially translations of visual objects into linguistic symbols used in those manipulations (Perfetti, 1985 : 5).

3.7.1 Language, speech, and print

If we consider the child learning to read, there are two obvious obstacles deriving from differences between speech and print namely, the decoding obstacle and the decontextualization obstacle (Perfetti, 1982 : 7). The fact that print requires the learning of a code is fundamental, especially for the reading process. Pupils should be able to decode printed words into an understandable language. The second major obstacle, is that the reader has to learn to deal with the decontextualized nature of print. The pupil comes to school with a fairly rich knowledge of language and considerable experience of using it. This experience, however, has been in contextualized language, speech that occurs in a social context. He has seldom had to deal with meanings that are solely in sentences, as is the case with pupils

reading at school. Meaning has been a joint venture with context providing as much information concerning message interpretations as speech itself. More often, things referred to in a conversation are physically presented in the world but shared only mentally by the participants in the reading process.

In print, the meanings are less determined by the context and more dependent upon sentences. The written sentence, unlike the spoken sentence, carries the meaning intrinsically. Syntactic processes must be used and they may not be sufficient. Inferences which might be used for decoding will also be less available in print. In the course of syntactic processes and inferences, reading will become increasingly a generalized linguistic activity. The differences between the print and speech will be reduced. It is even likely that mastering speech leads to some changes in the way speech gets used and reduces reading problems (Perfetti, 1982 : 7). These types of reading problems can thus interfere with the way learning context is interpreted from text, and must thus be foreseen and eliminated by the teacher.

3.7.2 Identification of specific skills

One reason why research on learning skills and strategies has become so popular, is because large numbers of pupils at all levels of education have demonstrated severe deficiencies in their knowledge of identifying reading skills and in knowing how to use what they do know to their advantage (Phye and Andre, 1986 : 246-265). Brown and Campione (1977 : 64) have found, for example, that pupils with marginal academic skills are deficient in such elementary cognitive skills as planning, implementing, and monitoring the success of rote recall strategies.

In initial reading, the two most important tasks are sight-word recognition, and decoding (Lewin and Allen, 1976 : 167). They form the basis for reading and for comprehension and, as such, are the objects of our search for prerequisite skills for solving reading problems. Sight-word recognition involves visual discrimination of letter strings, association and retention of labels for these strings, and the ability to retrieve and articulate the labels when shown the appropriate stimuli (Lewin and Allen, 1976 : 168). Association and

retention of letter strings form an important part of reading. Failure to identify and associate letter strings as a specific skill might lead to reading problems, for example, if we select sight - word recognition as one reading task, then certain prerequisite skills are immediately identifiable, including visual matching of letters, and the underlining of important words, which are causes of reading problems. We might extend this analysis to the lack of more specific skills that might result in reading problems including the inability to direct and focus the eyes, inability to distinguish between concepts of the same and different visual forms, and the inability to attend to visual patterns (Lewin and Allen, 1976 : 168). Underdevelopment of these ability skills contributes to the reading problems of the individual pupil (Lewin and Allen, 1976 : 168), and also influences his learning of subject matter from textbooks.

3.7.3 Final consonants, vowels, diphthongs, and double consonants

Pupils tend to make more errors on the final consonants of words than on initial consonants (Kagan and Lang, 1978 : 418). Printed vowels constitute a major problem, though vowels are easily detected when heard in speech. In addition, vowels change rules of pronunciation in a way that most pupils find capricious. The less stable the vowel, the more trouble we have with it during the reading process, for example, the short i sound, which almost always represents the letter i causes more confusion than for the short u sound, which can be represented by a variety of letters or combinations: o; oo; ou.

3.7.4 The reading process in content fields

The pupil's personal performance and knowledge in content areas can affect their reading performance in that content area. When one reads materials that are of no personal interest, one might end up with many problems in that material. Therefore the teachers should get the pupils to be interested in the materials they are reading in order to eliminate such problems (Lewin and Allen, 1976 : 168). The teacher's emphasis on a content area can affect the interest of pupils in that content area. The majority of pupils who perform best in a particular content area have teachers who emphasize content area to a great extent

in their classroom teaching practices. It is not the content of the material that affects the ability of any reader to construct meaning, rather, it is interest and background knowledge in that content and strategies and styles that influences comprehension of the content (Lewin and Allen, 1976 : 168).

3.8 READING STRATEGIES

Under the impact of renewed focus of the receptive skills, styles and strategies of learning and reading, second language specialists (Carrell, Pharis and Liberto, 1989 : 647-678; Wenden, 1989 : 573-597) are drawing on a wealth of reading theory and research. Barnett (1988 : 110) says that "reading is less a matter of extracting sound from print than of bringing meaning to print". To comprehend, for example, readers bring certain prior knowledge to a text and add to it, in support of or in contradiction, with the information and ideas gathered from reading. The interaction of this prior knowledge with the expectations of comprehension and the purpose of reading leads readers to anticipate a new content and determines which strategy and style could be used. A strategy is "a plan of a sequence of actions to attain a pre-established goal" (Klauer, 1988 : 355). A learning strategy, therefore, is a plan of a sequence of actions to attain a learning objective. A strategy is not a simple action but a complex ordered chain of actions. Learning styles, on the other hand, "are characteristic cognitive, affective, and psychological behaviours that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe, 1986 : 5). Some of the reading strategies are the same as learning strategies, because you learn a text by reading it.

Because learning is an internal process, we know that it has taken place only when we observe a change of learner behaviour of a more or less permanent nature resulting from what has been experienced. In this investigation strategies will be used to explain the reading process and how the pupils respond to the reading environment. In this study matric pupils will be taught reading strategies to attain good representation meaning, world meaning, and cognitive knowledge about reading with the aim of improving their reading ability. There are

learning goals like independent learning from text and representation meaning, which require reading strategies in order to attain the goals.

3.8.1 Metacognitive strategies in reading

Recently, the bulk of research (Stewart and Tei, 1983 : 36; Bondy, 1984 : 235; Jacobs and Paris, 1987 : 257-259; Phye and Andre, 1986 : 265), on how readers take steps to understand and learn from text has been conducted from the perspective of metacognition. Metacognition should be distinguished from cognition. Cognition refers to "the intellectual functioning of the mind and is characterised by remembering, comprehension, focusing, attention and processing of the information" (Babbs and Moe in Monteith, 1988 : 1). Metacognition generally refers to "one's knowledge of cognition, and how to regulate one's cognition" (Monteith, 1988 : 1). The differences between cognition and metacognition are differences in self awareness and control. Whereas cognitive processes involve conscious monitoring and regulation, metacognitive processes involve awareness of monitoring and regulation of cognitive processes (Steward and Tei, 1983 : 36; Bondy, 1984 : 236).

Metacognition in the context of reading is usually understood to consist of two types of cognition. First, one's knowledge of strategies for learning from text, and, second, the control readers have over their own actions while reading for different purposes (Kirby, 1984 : 90; Jacobs and Paris, 1987; Carrell and Pharis and Liberto, 1989 : 650). Metacognitive control, in which the reader consciously directs the reasoning process, is a particularly important aspect of strategic reading. Successful readers monitor, in most cases, their own reading and the state of their learning; they plan strategies, adjust efforts appropriately, and evaluate the success of their own ongoing effort to comprehend (De Bettencourt, 1987 : 26; Carrell et al, 1989 : 650).

Reading is an acquired skill. The reader learns to engage in certain activities to achieve the goals of reading. Reading, for example to study, may involve recognition and retention of the main points, rereading the important sections, making adjustments in reading rate, and self-testing to monitor the success of various strategies (Stewart

and Tei, 1983 : 37; Winograd and Niquette, 1989 : 7). Awareness and understanding of these strategies and the conscious control over their use are all metacognitive strategies. Many pupils may believe that they are applying these strategies while, in fact, they are not. The research on reading and metacognitive strategies has something to offer to our understanding of reading and instruction. The investigator taught the pupils some of these strategies in the programme which constitutes the independent variable in the empirical part of this research project.

3.8.1.1 Knowledge about cognition

Knowledge about cognition can be described as that segment of a pupil's stored information that has to do with people as cognitive creatures and with their diverse cognitive tasks, goals, actions, and experience (Wenden, 1989 : 574). It thus refers to the set of facts learners acquire about their own cognitive processes as they are applied and used to gain knowledge and acquire strategies in varied situations. Knowledge about cognition is concerned with a person's knowledge about his own cognitive resources and the comparability between the person as a learner and the learning situation. The ability to reflect on one's own cognitive processes and to be sure of one's own activities while reading and solving problems, is that develops later strategy and which has important implications for the pupil's effectiveness as an active, planful learner. If the pupil is aware of what is needed to perform effectively, then he can take steps to meet the demands of learning situations more adequately. If, however, the pupil is not sure of his own limitations as a learner or the complexity of the task at hand, then he can hardly be expected to take preventive actions in order to anticipate or recover from problems. There is a growing need for pupils at schools to be made aware of their cognitive knowledge (Wenden, 1989 : 574).

An integral part of being a fluent reader is knowledge about reading processes and reading strategies. Garner (1987 : 17-18) and Stewart and Tei (1983 : 37) agree on this part of reading.

Knowledge of reading strategies gives pupils control over their reading processes and strategies. The critical task of reading is locating and extracting meaning during the reading process. Fluent readers not only are highly proficient at constructing overall meaning, they are also adept at finding meaningful elements and their role in the author's message. Closely related to the ability to recognize major ideas is the capacity to summarize passages by selecting major points. The knowledge of the reading process serves as a strategy for the pupil to be able to summarize passages. Someone may know about a strategy, but not apply it. These findings support the hypothesis that readers differ in strategy and in ability to judge whether or not comprehension is proceeding satisfactorily. When readers identify superfluous portions of text, they show that they are reflecting upon their knowledge about reading as a strategy to comprehension and are able to make judgements on their reading process. Such activities are integral to metacognition (Stewart and Tei, 1983 : 8). What pupils know about the goals, tasks, and strategies of reading can influence how well they plan and monitor their own reading by eliciting representation meaning from text.

3.8.1.2 Regulation of cognition

This cluster of strategies consists of the self-regulatory mechanism used by an active learner during ongoing attempts to solve the problem. It entails planning one's next move, monitoring the effectiveness of any attempted action, and testing, revising, and evaluating one's strategies for learning. Effective reading requires an active monitoring of one's own cognitive activities. Failure to monitor can lead to serious reading problems which may result in poor achievement for pupils. To illustrate, metacognitive knowledge is indicated when a pupil notes that it is necessary to prepare differently for an essay than for a multiple choice test. When a pupil plans his approach to studying by writing the main ideas and supporting detail statements for each segment of text, monitors how effectively this approach is working and evaluates the outcomes of such a

strategy, the pupil is regulating cognition. It is not sufficient for teachers merely to instruct learners about strategies that enhance learning, the pupils must monitor and regulate their own use of these strategies (Palincsar, 1986 : 118).

3.8.2 The use of reading strategies to attain learning goals

Reading strategies are used to attain goals like independent learning from text, and representation meaning, world meaning and cognitive meaning.

3.8.2.1 Independent learning from text

There are likely to be at least two main types of pupils in any classroom. Some read purposefully even when meaning is unclear, and raise questions in order to clarify an assignment. They use reading flexibly as a tool for learning and pleasure (Garafalo, 1987 : 422). Others never re-read, have little or no awareness of an occasional lack of understanding when reading directions, and have not learned to use reading as a versatile tool for learning or pleasure. The disparity of performance that results from such a contrast in behaviour can be attributed to the pupils' differences in general learning ability, reading ability, background knowledge or experiences, world knowledge, world recognition strategies, vocabulary development, or basic motivation to succeed. This disparity can rather be attributed to a lack of using independent learning from the text. One uses reading and learning strategies in order to learn independently from text. The first mentioned type of pupils strategically regulate their reading process, and display knowledge or learning obtained independently from the text. The second type do not (Garafalo, 1987 : 422).

3.8.2.2 Representation meaning

Mosenthal (1988 : 15) describes representation meaning as "that meaning assigned to various types of linguistic, pictorial,

and/or mathematical symbols." In the reading field, it can refer to the dictionary meaning of words. We might argue that the only way to strategically read the passage for meaning would be to know what each word meant in terms of its dictionary definition. Representation meaning, however, is not limited to understanding individual words. It also involves understanding the meaning of combinations of linguistic symbols, such as words combined into sentences, sentences combined into paragraphs, and paragraphs combined into stories. Pupils in the experimental group were taught to understand meanings of the combinations of linguistic symbols while those in the control group were not. In order to see that someone read the comprehension passage for meaning, we may require that they understand the different words, phrases, and sentences and how these are combined to create an overall linguistic meaning, even a main linguistic idea.

3.9 SUMMARY

The aim of this chapter was to explain reading ability, and by taking the developmental history into account, to show how reading is related to learning. Reading involves the processing of information from the printed words until that information is stored. Reading is a process made up of different components, like word recognition, decoding, comprehension, and language. Reading can be influenced by factors from biological, psychological and linguistic perspectives. It has also been found that there are problems during the reading process inherent in language, speech, and print. Different strategies and styles can improve the reading ability of pupils and it is believed that improved reading ability will improve pupil's academic achievement. The literature study reviewed in this chapter supports the need to teach reading strategies to matric pupils in order to improve their reading ability in the language in which they are conducting their studies (English), so that they can then apply those strategies in the content subjects and improve their total achievement.

CHAPTER 4

4 METHOD OF INVESTIGATION

4.1 Introduction

The medium of instruction in Black High schools is English. It is believed that the teaching of some strategies to improve pupils' reading ability in the medium of English, will help to improve their achievement in the subject English and other subjects, like Biology and History. Therefore the aim of the investigation is to determine the relationship between reading ability and achievement in English as a second language and other content subjects at matric level.

4.2 Variables

By taking a sample, it can be accepted that the variables that influence academic achievement are controlled and that their influence on the experimental and control groups are the same. As it is the aim of this study to determine the relationship between reading ability and academic achievement, reading ability and academic achievement in various subjects are used as variables.

The dependent variables are academic achievement in English, History and Biology.

The independent variable is reading ability. Reading ability is operationalized by means of a programme involving reading strategies that claim to improve reading ability.

4.3 Research Hypotheses

4.3.1 Pupils who are exposed to a reading programme at matric level achieve better results in English as a second language than those who are not exposed to a reading programme at matric level.

4.3.2 Pupils who are exposed to a reading programme at matric level achieve better results in other subjects than those who are not exposed to a reading programme at matric level.

4.4 Population and sample

Matric pupils from three high schools were used in the investigation as a research population. There were only three high schools in the circuit of Education and the researcher wanted to involve all three high schools in order to be able to make valid deductions. A stratified sample was taken to get subjects whose academic achievement was equally distributed. The numbers of low ability pupils were 31 (at or below the 40th percentile), average ability pupils were 57 (at the 50th and 74th percentile), and high ability pupils were 20 (at or above 75th percentile). The total number of pupils partaking in the investigation was 108. The sample is illustrated in table 4.1.

	ABILITY	SCHOOL			TOTAL
		1	2	3	3
	HIGH	06	10	04	20
	AVERAGE	20	22	15	57
	LOW	10	12	09	31
TOTAL		36	44	28	108

Table 4.1 Summary of the sample

Table 4.1 represents a table of the summary of the selection according to schools and ability. It shows how pupils were selected according to their abilities in each school, for example, in the second school, ten pupils with high ability, twenty two with average ability and twelve with low ability were selected. The total number of pupils from school two was forty four.

The subjects were randomly given numbers, from one to a hundred and eight. They were then divided into two groups. Subjects with odd numbers belonged to group 1 (experimental group) and subjects with even numbers belonged to group 2 (the control group).

4.5 Experimental design

A true experimental design was used, as illustrated in table 4.2.

GROUP	PRE - TESTS			PROGRAMME	POST - TESTS		
E	Y1	Y2	Y3	X	Y1p	Y2p	Y3p
C	Y1	Y2	Y3	-	Y1p	Y2p	Y3p

Table 4.2. The experimental design

- E - experimental group
- C - control group
- X - manipulation by a reading programme
- - traditional reading method; no manipulation
- Y - pre-tests.
- Yp - post-tests.

Both groups were tested in English, Biology and History before the experiment and after the experiment to find out whether there were any difference in academic achievement between the experimental group and the control group.

4.6 Duration

The duration of the reading programme experiment was two weeks. Four hour-long sessions were given per day. Pupils had to come for a two-hour session in the morning and for another two-hour session just before lunch.

4.7 Procedure

During the briefing session the pupils were informed about the investigation, motivated to take part and encouraged to attend all the other sessions.

A reading programme was used with the experimental group during which the passages found in the appendix were taught, whilst the subjects in the control group were taught by the traditional method (pupils were

not made aware of reading strategies). The reading programme consisted of three reading passages based on English, Biology and History. The subjects in the experimental group went through these passages whilst they were shown some reading strategies (see par. 3.8). It was explained to the experimental group that the strategies taught to them would improve their reading ability in English and help them to achieve better results. An improved reading ability and the use of reading abilities in English could be transferred to other content subjects. The control group was asked to go through the passages using the traditional methods, that is, the reading methods taught to them by their teachers and which they had been using in the past. They were asked to read the passages, then answer the questions that follow. No reading strategies were taught or shown to them.

The end of May tests were used as pretests for both groups. Post-tests were given to both groups, after the teaching of the learning contents.

4.8 Material

Four expository passages of about 900 words each were taken from Ogundipe, 1972 and Tregidgo (1972 : 2-5) and Quek (1972 : 139-142). Each passage formed a self-contained text, in that it had a clear beginning and concluding section (see appendixes 4 and 5). The rationale for using self-contained texts is to teach pupils the strategies in one subject, English, then to transfer the strategies to the next subject (passage), Biology, and finally to transfer them to the third passage, History. The texts used were similar in the degree of difficulty but drawn from different subjects.

4.9 Measuring instruments

4.9.1 Pre-tests

The May-monthly-tests for the standard nines and tens, which were the last tests they wrote before the winter holidays, were used to get pupils' achievement before the experiment was conducted. It can be accepted that the tests are reliable and valid because they were normal tests used to assess the progress of pupils on a half-yearly basis.

The test results were moderated and compiled with the help of the experienced subject teachers.

4.9.2 Post-tests

The post-tests used were based on different paragraphs. The investigator consulted experienced subject teachers in constructing the post-tests, and they were also approved by the circuit education officers. It can be accepted that the tests have validity and reliability. They required the application of the strategies taught to the experimental group during the reading programme. The tests were the same for both the experimental and control group.

4.10 Statistical techniques

The S.A.S. - computer programmes were used to analyze the results.

Descriptive statistics like means and standard deviations were used and the data were presented with the help of tables and graphs.

The aim of the investigation is to determine whether a reading programme caused a difference in reading ability and hence a difference in achievement between the experimental and control group. t-Tests were used to determine if there were significant differences between the experimental and the control groups with respect to the achievement in the pre-tests and post-tests with regard to improvement in academic achievement. Correlations between the achievements in the pre-tests of the different subjects for the experimental and control groups and the corresponding improvements in academic achievement on post-tests of the different subjects for the experimental and control groups were calculated. It was done to determine the relationship between the initial achievements and the improvements in academic achievement of the experimental and control groups for the different subjects. In the next chapter (chapter 5) the investigator concentrates on the results as obtained in the investigation, using the outlined statistical techniques.