CONCEPTUAL AWARENESS OF ESL STUDENTS AT A COLLEGE: AN ASSESSMENT

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Dedicated to my daughter Jennifer Viljoen

ABSTRACT

The aims of this study are to determine the role that concepts play in the learning process and whether first-year disadvantaged English Second Language (ESL) college students are familiar with central subject-specific concepts. The basic assertion is that effective and meaningful learning can only occur if the students can relate the content of a text to existing background knowledge (schemata) and if the language of the text is understood.

The study has revealed that a pre-existing knowledge base of concepts gives students a means of measuring new concepts. The development of concepts is affected by personal life experiences, cultural traditions, the student's mother tongue, the context in which the word appears and by vocabulary knowledge.

Contextual and personal factors that give an indication of the students' background have also been determined, because no student can be separated from his or her background.

An empirical study has been undertaken during which the students have written a test that consists of 52 subject-specific concepts. The students' conceptual comprehension ability has been tested in three subjects, namely Communication, Computer Practice and Entrepreneurship. The findings of the empirical study have shown that the conceptual awareness of disadvantaged ESL students at Rustenburg College regarding the subject fields tested is inadequate. The concepts are often interpreted in a general sense, rather than within the context of a specific subject. Students also seem to experience difficulty with the more abstract concepts.

Practical guidelines and strategies are proposed to improve the students' conceptual awareness. These strategies include cross-curriculum teaching, rule-example and example-rule strategies, concept mapping, inquiry-based instruction, authentic learning and strategies based on constructivism. Factors that influence the choice of learning strategies are also considered. These include students' needs, time allocation, student

characteristics, focus of instruction and the type of learning task that the student is confronted with.

Key words: concepts, conceptual comprehension, cognition, schemata, learning, language, tertiary education, college, disadvantaged/ESL students.

OPSOMMING

Die doelstellings van hierdie studie is om die rol wat konsepte in die leerproses speel, te bepaal en om vas te stel of voorheen benadeelde Engels Tweede Taal Kollege studente in hulle eerste jaar met sentrale konsepte in bepaalde vakgebiede bekend en vertroud is. Die basiese aanname wat gemaak word, is dat effektiewe en betekenisvolle leer slegs kan plaasvind indien die student die inhoud van 'n teks kan verbind met bestaande agtergrondkennis (skemata) en indien die taal waarin die teks geskryf is, verstaan word.

Die studie het bevind dat 'n bestaande kennisbasis van konsepte aan die student 'n manier verskaf waarop hy nuwe konsepte kan meet. Die ontwikkeling van konsepte word deur persoonlike lewenservaring, kulturele tradisies, die student se moedertaal, die konteks waarin die konsep voorkom en deur woordeskat beïnvloed.

Omdat geen student onafhanklik van sy agtergrond kan funksioneer nie, is persoonlike en kontekstuele faktore wat 'n algemene indruk van die studente se agtergrond skep ook bepaal.

'n Empiriese studie waartydens die studente 'n toets afgelê het wat uit 52 vakverwante konsepte bestaan, is gedoen. Die studente se kontekstuele begrip is in drie vakke, naamlik Kommunikasie, Rekenaarpraktyk en Entrepreneurskap, getoets. Die empiriese studie het bevind dat die konseptuele bewustheid van voorheen benadeelde Engels Tweede Taal studente aan Rustenburg Kollege rakende die betrokke vakgebiede onvoldoende is. Dit wou voorkom asof die studente probleme ondervind het om begrippe binne die konteks van 'n bepaalde vak te interpreteer. Studente het ook probleme met die meer abstrakte konsepte ondervind.

Praktiese riglyne en strategieë wat geïmplementeer kan word om die studente se konseptuele begrip te verbeter, is voorgestel. Hierdie strategieë sluit kruis-kurrikulêre onderrig, reël-voorbeeld en voorbeeld-reël strategieë, konseptuele uitleg, navraaggebaseerde onderrig, outentieke leer en strategieë wat op konstruktiwisme

gegrond is in. Faktore wat die keuse van leerstrategieë beïnvloed, is ook in aanmerking geneem. Dit sluit in: die studente se behoeftes, tydsduur, studente se karaktereienskappe, die fokus van die onderrig en die tipe leertaak waarmee die student gekonfronteer word.

Kernwoorde: konsepte, konseptuele begrip, kognisie, skemata, leer, taal, tersiêre onderrig, kollege, voorheen benadeelde/Engels Tweede Taal studente.

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INTRODUCTION AND PROBLEM STATEMENT

1.1 INTRODUCTION

South Africa is a unique country because of its cultural diversity and multilingual society. This scenario is a challenging one, especially from an educational perspective. An option offered by the Department of Education and Training is an attempt to develop Black languages as media of instruction, but naturally such efforts are part of a long-term investment towards a true culture of multilingualism in South Africa. At present, the value of English as medium of instruction at educational institutions, more specifically tertiary institutions, cannot be ignored or underestimated, even though it is the second (sometimes even third or fourth) language of approximately 95% of all Black students enrolling for tertiary study (Butler, 1998: 21).

Kilfoil (1999: 52) maintains that in South Africa it is possible that Black students studying through the medium of English have no underlying concepts for scientific, commercial or technological phenomena, or that they have no words in their native language, even though the concepts might exist.

It is against this background that the problem to be investigated in this study must be seen.

1.2 PROBLEM STATEMENT

During the past few years the role of colleges has become increasingly important in the provision of access to tertiary study for potential students from all different cultural groups in South Africa. Tuition at a college is often less expensive than

studies at a technikon or university, the duration of the courses is shorter and the entry requirements are not as strict as those for university or technikon study.

A college is an institution that offers professional courses related to the corporate world on tertiary level. One such college is Rustenburg College. The tertiary courses offered at this institution range from Introductory to N6 level in both Business Studies and Engineering. A standardised placement test is written by all potential students who wish to enrol at the college for the first time. Students are placed on either the N4 or the Introductory N4 level, depending on their test results. The Introductory N4 level is a bridging course, and students who score below 60% for the placement test are placed in it. No student is refused admission.

Approximately 90% of the students use Setswana as First Language, ± 4% use isiXhosa, ± 5% use South Sotho and ± 1% use Afrikaans as First Language.

The textbooks used by the students are in English and the medium of instruction in the classroom is also English. The latter is the second language of approximately 95% of the students.

First-year students are faced with an academic environment in which they should possess fairly advanced cognitive skills (Strydom, 1997). In order to cope successfully with the various subjects, they need to be skilled in basic comprehension skills. Vygotsky (1967: 56-60) has argued convincingly that knowledge cannot be acquired without language. Word meaning forms the basis of all study, because it unites thought and speech into verbal thought. This involves knowledge of concepts: students are expected to understand certain basic concepts, which in turn are used in the clarification of more advanced or difficult concepts (Clarke, Scarino & Brownell, 1994: 18).

The use of concepts to form propositions is basic to human thought and communication, and is closely related to language acquisition. Concepts are the abstract meanings that words and other linguistic items represent (Lambani, 2001: 23). Whitehead (1990) states that concepts are flexible ranges of options that help learners to impose some order and pattern on the complexity and diversity of raw experience. Swart (1988) points out that learners acquire concepts by observation and by definition, and it is the experience that learners obtain within their learning contexts that enables them to understand concepts more clearly.

When confronted with a text containing new information, new experiences and words are matched to and integrated with prior experience or conceptual knowledge, which is already named and familiar to the student. If the student manages to reconcile new concepts with existing schemes, conceptual comprehension takes place (Whitehead, 1990: 73). Farley and Elmore (1992: 1) point out that any text refers to explicit or existing knowledge, i.e. conceptual knowledge already familiar to him, and to implicit information supplied by the text itself (e.g. vocabulary, diction, context) to comprehend the message intended by the text.

The reader's background knowledge of the language, the world, text types and the subject matter is crucial to comprehension or construction of meaning. According to Ruddell (1994), these various knowledge elements interact with one another to build meaning. Nagy and Herman (1987) write, "Knowledge does not consist simply of an unstructured set of individual facts, but rather of organized, interrelated structures of schemata". Schemata refer to organized representations of background events. These are high-order processes of comprehension and they usually demand a lot of attention and energy. If readers have to slow down and pay attention to word recognition by employing the strategy of phonemic decoding, they find it difficult to understand the meaning of the sentence or the paragraph in which the new or unfamiliar word may occur. Consequently, the process of constructing meaning is disrupted (Day & Bamford, 1998: 15).

Comprehension can only be achieved if word recognition is automatic and accurate. It is clear that reading and conceptual comprehension are closely interrelated, as comprehension of the text depends upon the student's ability to interrelate appropriately required knowledge with the information suggested in the text. If students manage to comprehend what they read, they can integrate it into their existing framework of knowledge. Should they fail to integrate existing conceptual knowledge with new information supplied in the text, learning cannot take place (Day and Bamford, 1998: 15).

Approximately 80 – 90% of all students enrolled at Rustenburg College are previously disadvantaged English Second Language (ESL) speakers. The researcher's experience with these students over the years has shown that they often fail to grasp basic language concepts and instructions used in the textbooks (cf. Saunders, 1991). The lack of conceptual knowledge is thus one of the major problems that these students face (cf. Kilfoil, 1999; Lambani, 2001).

Various external factors or variables may contribute to the problems that they experience with conceptual comprehension. These include the socio-economic background of students and a disadvantaged educational environment. Lambani (2001: 54) points out that socio-economic background (including factors such as lack of access to reading materials and electronic media) may have an influence on students' ability to cope with concepts in subjects. Grobler (1991: 4) points out that "the way in which our students were taught and their experiences of languages in general affect their ability to deal with the level of work at tertiary institutions."

At present there is no data on college students' knowledge of concepts in their subjects in South Africa. The problem to be investigated can be summarised by means of the following questions:

- What is the role that concepts play in the learning process?

- Are first-year students familiar with (i.e. can they define and explain) the central concepts in the prescribed academic texts of their subjects?

- What environmental factors may influence the students' conceptual awareness?

1.3 AIMS OF THE STUDY

The aims of the study are to establish:

- The role of concepts in learning.

- Whether students are able to define and explain the central concepts of their English academic texts.

- The environmental factors that may influence the previously disadvantaged ESL student's conceptual awareness.

- The implications of the findings for teaching of concepts at the college.

1.4 METHOD OF RESEARCH

The first part of the study consisted of an extensive and detailed survey of literature regarding cognition and learning, the role of concepts in learning and external factors that could play a role in conceptual awareness.

The second part of the research entailed an empirical study based on a one shot cross-sectional survey. The researcher wanted to determine how well the subjects understood central concepts from three different subject fields

The subjects who participated in the study were a group of 73 Introductory students at Rustenburg College who all came from a disadvantaged background and who spoke English as a second language. The data was collected by using a test in which students had to use each concept in a sentence of their own and then define the concept in their own words. The test also comprised a list of general questions focusing on the students' background and previous learning experiences. The collected data was analysed and quantified in terms of percentages. The findings were discussed and strategies for improving conceptual awareness were suggested.

1.5 OUTLINE OF STUDY

The chapter division for the rest of the study is as follows:

- Chapter two discusses the link between learning and language.
- Chapter three outlines the importance of concepts in learning.
- Chapter four focuses on some factors that may influence conceptual awareness.
- In chapter five the method of research is outlined.
- Chapter six focuses on the presentation and interpretation of the results.
- Chapter seven discusses several strategies that may be applied to improve conceptual awareness.
- Chapter eight is the conclusion and contains recommendations for further research.

CHAPTER TWO

THE LINK BETWEEN LEARNING AND LANGUAGE

2.1 INTRODUCTION

The influence of cognitive and conceptual development on language development has been studied extensively by many researchers in the past. It may seem to be a logical, straightforward link, but it is one of the most problematic and intriguing issues in present-day cognitive science. Pederson and Nuyts (1999: 1) explain the cognition, concept and language process as follows:

> Since people are able to speak and understand a language, or languages, they must have an internal 'representation of linguistic knowledge' allowing them to perform this behaviour. People acquire, store and transmit – through language but also through other forms of behaviour – information about the world, information they can obviously also use in planning, in reasoning, in problem-solving and in performing many different types of (intentional) actions in a fairly systematic and relatively well-adjusted way in many different environments. Accordingly, they must have an internal 'representation of knowledge about the world', i.e. 'conceptual knowledge" (whereby the notion of the 'world' includes not only the physical world – 'external reality' – but also the social and the psychological world).

Studying at a college to obtain a diploma does not only entail learning facts or being trained to do a specific job. It also involves developing the skills of comprehension, as well as critical understanding in a particular field. Comprehension of texts in an academic environment is a prerequisite for academic success. At tertiary level a student is also expected to develop critical

thinking skills and to be open to new ideas. The use of advanced academic concepts and formal language usage are also essential and the novice tertiary student (whose cognitive and linguistic skills may not be sufficiently developed), can become discouraged over a period of time.

Kokong (1991: 5) states that there is general agreement among educationists that learning activities involving language are crucial factors in a student's education. Attention will now be given more specifically to the role that language plays in learning, as this is a major factor that influences the failure or success of students (Kokong, 1991: 5).

2.2 THE LINK BETWEEN LANGUAGE AND LEARNING

Language plays a central role in any educational institution. In a tertiary teaching environment, students deal with language most of the day. They are either involved in oral activities with lecturers and friends, or they are engaged with the language written in their textbooks. According to Stubbs (1983: 17), teaching and learning comprise linguistic activities such as listening, thinking, explaining, paraphrasing and summarizing. The teaching of concepts cannot be separated from the teaching of learning strategies, such as using subject-related terminology correctly or how to comprehend the textbook of a specific subject. Together with language, the teaching of concepts and learning strategies influence learning outcomes and the transfer of what has been learned.

Students who do not have sufficient command of the language of instruction in the classroom and in textbooks, are likely to resort to literal reproduction of the words in a textbook or an instruction. They fail to comprehend the greatest part of the information or text and to make sensible connections between pieces of information, because their language skills are inadequate. Consequently, they find it easier to resort to rote learning and regurgitation of facts. According to Schmeck (1988: 97), this surface or one-dimensional approach to learning leads to

non-perception of the total structure of information, and disconnected bits and pieces that are memorized through repetition.

However, the opposite is also true. If a student is able to control the language of instruction efficiently, he will have more success comprehending the real meaning of the text. Schmeck (1988: 64) calls this the deep approach and states that it includes perception of the information structure, as well as the hierarchical components of the learning material that is studied. This implies that the students whose language proficiency is good, will be able to make sensible connections between bits of information. Such a student will be able to identify the most important facts in the text and distinguish them from those facts that are less important.

A number of researchers, such as Goldman (1976: 123), Vrey (1979: 104) and Morgan et al. (1986: 76) have shown that a child's sentence construction ability improves with age. Goldman (1976: 123) also maintains 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 tertiary students are exposed to more complex sentences, and this places more demands on their language comprehension and learning ability.

Klauer (1988) schematized a model of the prerequisites of learning and comprehension. The model shows that to improve comprehension in order to achieve successful learning, the factors that influence the learning and comprehension processes must first be in place. The model is presented as follows:

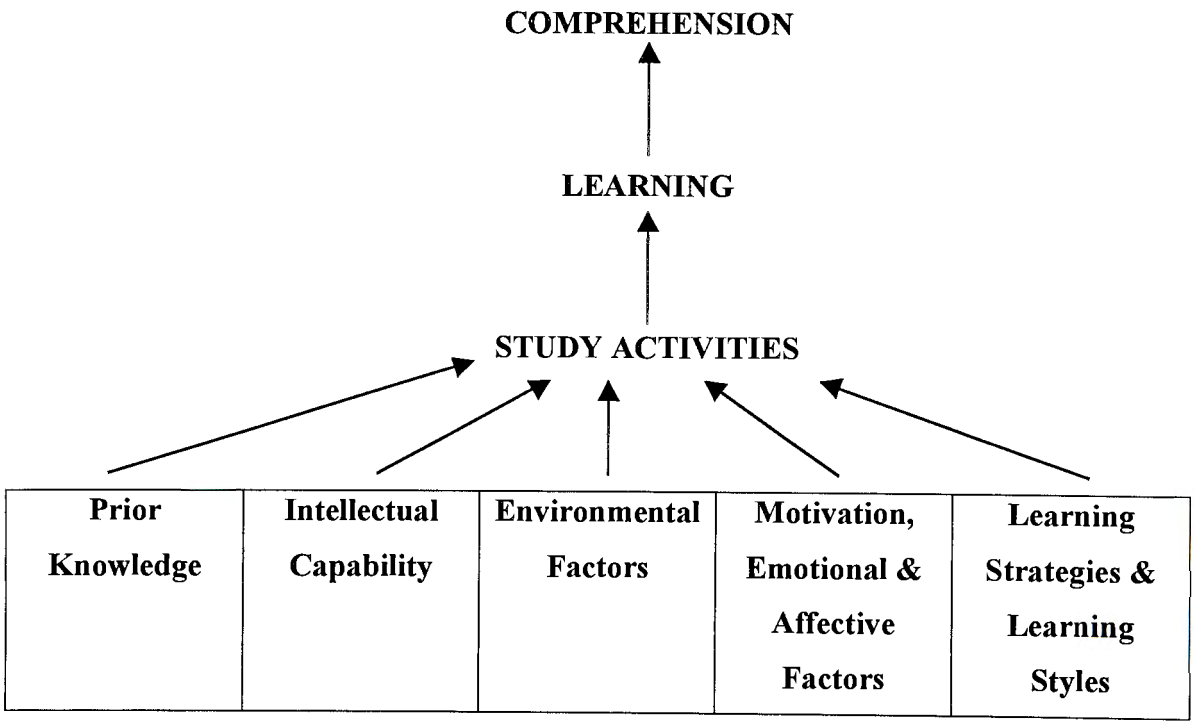

Figure 2.1 Factors influencing learning and comprehension (Klauer, 1988)

According to this model, learning, which ultimately leads to comprehension, is conceived to be dependent on study activities, which in turn are dependent on the following five factors: prior knowledge, intellectual capability, environmental factors, motivation and learning strategies and styles. These five factors are not independent of each other, and they are mostly external. However, their effects are internal, for it is the student's personal comprehension ability that is ultimately affected by these factors.

Cognitive abilities such as language ability and reading ability will fall under the category Intellectual Capability. These abilities develop quite slowly over the years, but once developed, they enable the individual to deal with his social and physical world more effectively.

For all students, academic success is largely measured by the extent to which they become proficient in cognitive skills, reading skills and conceptual awareness.

According to Reyes (1984), the student depends largely on his or her own comprehension of informational material as the principal source of knowledge. McLaughlin (1994: 59) maintains that the successful learner must have automated language skills, visual and auditory memory, the ability to associate and integrate intra- and intermodal stimuli, and the ability to abstract and generalize patterned or rule-generated information. These are all cognitive skills that are maintained, executed and stored in language. Failing to comprehend a given concept, text, question or written assignment will ultimately impede a student's performance.

As cognition forms such an important part of successful learning, it is necessary to elaborate more on this.

2.3 COGNITION AND LEARNING

According to Richards et al. (1992: 59), cognition refers to the various mental processes used in thinking, remembering, perceiving, recognising, classifying and the like.

The term *cognitive* can also be described as the processing of information from the environment that is received through the senses (Kokong, 1991: 8). 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. It also involves the ability to question the validity of what is read, being able to distinguish between fact, opinion and speculation. All these activities are interrelated.

According to Kokong (1991: 8), the major source of information on new ideas on learning in recent years related to information processing, storage and retrieval, or the learning process. Learning refers to relatively permanent changes in behaviour as a result of experience (Kokong, 1991: 8). Cognitive learning is,

therefore, a change in the way information is processed and stored as a result of experience. New associations are formed; these changes are stored in the memory for future use and the student is actively involved in this process.

Learning involves the cognitive organization of information in the mind (Kokong, 1991: 20). Well-developed cognitive skills will ensure that the learning process can take place successfully. The student is actively involved in the process of learning, for the brain has to process the information it is confronted with before that information can be stored and used effectively. During the learning process, the mind is not merely a void, filled with facts. It is rather a coherent view of the world, made up of schemata, i.e. the individual's concepts, beliefs and experiences organised into structures in the long-term memory that are used in making sense of things and actions.

When a student reads a text and encounters a concept, he will relate it to his own schemata, possibly modifying it as well to fit it into his original schemata to try and make sense of the concept. It follows that students who do not apply schemata appropriately will have trouble learning the new concept (Kokong, 1991: 21). Schemata for different subjects differ, but the student will be able to learn better in a subject if he has acquired the schemata appropriate for that subject (cf. 2.6.1).

Forrest-Pressley and Waller (1984: 66) state that important cognitive aspects of language can be measured by vocabulary, the ability to identify concepts used in a text and the ability to use grammatical rules to make appropriate sentences.

Kokong (1991: 11) states that students who have more prior knowledge and content-relevant high-order conceptual structures should be more adept at learning content than less knowledgeable students, because learning comprises both conceptual knowledge and cognitive processes. A student who has developed critical thinking skills will be more in control of the learning process,

accepting some assertions, while rejecting or modifying others. This student becomes an independent thinker and learner in an academic context. Lambani (2001: 39) states that cognitive changes do not result from the accretion of information, but result from processes involved in conceptual reorganization. Learning with understanding is more likely to promote transfer of knowledge than simply memorizing information from a text or lesson.

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. A student who fails to go beyond individual words and sentences and who cannot deal with the stream of incoming concepts and information and put them all together does not comprehend. Each student has his or her own individual preferred way of perception, organization and retention. These abilities develop differently in each individual, but once developed, they will enable a student to deal with his or her social and physical world more effectively. If these abilities are correctly and positively exploited during the student's secondary education, they will facilitate retrieval of information at tertiary level and then comprehension and learning can be improved.

Two major models that recur in current literature regarding cognition and learning are those of Piaget and Vygotsky.

2.3.1 Piaget's genetic epistemology

Piaget distinguishes two principal aspects regarding cognition:

- The formal viewpoint which deals with the configuration of the state of things to know, e.g. perceptions, mental images.
- The dynamic or developmental aspect which deals with transformations.

Piaget argues that the study of the development of thought shows that the dynamic aspect is at the same time more difficult to attain and more important, because only transformations make us understand the state of things (Piaget, 1946: 271).

Piaget also maintains that logic is not inborn in children, but it develops towards a process of mental equilibration or balance. This is an active internal process of self-regulation in which there is an organizing and co-ordinating of one's own intellectual development (Hamachek, 1975: 101,141; Russel, 1978: 92 – 95). At first the child is totally egocentric, lives in the here-and-now and has no way of cognising the thoughts of others in relation to himself. He is unable to decenter, i.e. to abstract spatially or temporally from his present perspective and see events from another point of view (Piaget, 1946: 271).

As the child is exposed to meanings given to concepts within his environment, reciprocity through other people develops (Lambani, 2001: 27). The child arrives at his first complete dynamic structures (grouping together objects recognized as similar, ordering activities, understanding asymmetrical relations, classifying and ordering numbers) at the age of about 7 – 8 years. However, these structures still remain concrete and are applicable only at the time of handling them. It is only at the age of 11 – 12 years that the child's dynamic structures are fully formed (Piaget, 1946: 272).

According to Hector (1981: 45), Piaget considers thought to be a basic function on which language depends. Thought originates in internalised action. The latter functions as a representation and this is how the symbolic function of language develops. Piaget acknowledges the influence of growth on what learners know and learn. As the learner interacts with things and people in his environment, his intellect grows. Encoding and decoding processes depend on the code used by the learner. This code changes with cognitive development (Lambani, 2001: 39).

However, Piaget seems to under-emphasize the cultural transmission of knowledge (Lambani, 2001: 28). He seems to view psychological structures, such as operations, intelligence, memory etc. as independent of the individual's relations to the cultural environment, other people and social practices. Piaget views language as an addition to the cognitive process of learning. He proposes that cognitive development proceeds on its own, generally followed by linguistic development, or finding reflection in the learner's language.

Cultural experience is an inevitable part of the child's context of mental imagery and plays a part in the child's formation of concepts as he grows. If new concepts are introduced to the student and he/she fails to link them to his existing cultural experience, a connection between existing and new knowledge may never take place. Cultural experience as an influencing factor regarding conceptual knowledge is discussed in Chapter 4 (cf. 4.3.3).

2.3.2 Vygotsky's theory of cognition

Vygotsky describes two phases in the development of knowledge. First, automatic unconscious acquisition takes place. This is then followed by gradual increases in active conscious control over that knowledge (Brown, 1985: 453). The latter phase refers to cognitive aspects of performance.

Vygotsky views cognition as an intertwined, simultaneous acquisition of language and concepts. He maintains that language is a psychological tool for culturally developed ways of behaving towards objects (Meadows, 1993: 244). Each word is already a generalization in itself, because it does not refer to only one object but to a class or group of objects. Generalization is a verbal act of thought and reflects reality differently from sensation and perception. According to Vygotsky (1967: 38), real communication requires meaning. Meaning is an act of thought and an inseparable part of words. Therefore, it belongs to the realm of thought (Vygotsky, 1967: 38). Word meaning forms the basis of all study because word

meaning unites thought and speech into verbal thought. Generalization represents an advanced stage in the development of word meanings. Vygotsky claims that the higher forms of intercourse are possible only because man's thought reflects conceptualized actuality. That is why certain thoughts cannot be communicated to children, even though they may be familiar with the necessary words. The adequately generalized concept that alone ensures full understanding may still be lacking (Vygotsky, 1962: 57).

There seems to be a close relationship between the growth of the child's thinking ability and his social development. As the child matures, the pictures and concepts that he already has in his mind are as much part of language as attaching the correct words to the concepts. If the concept does not exist in thought or is not matured, the young learner may hear and even become familiar with the new words, but these will have little meaning for him. Through learning, the child matches concepts and words.

Vygotsky's main argument can be summarized as follows: concepts and language acquisition are inseparable and high level cognitive functioning is possible only by integrating them.

Of the four general skills that need to be mastered to become proficient in a second language, namely speaking, listening, reading and writing, reading is crucial for a student entering into a second language academic environment. Reading is often the primary means by which academic knowledge is transmitted. It is also a useful secondary source for information that might be missed in a class discussion or lecture, as students can read up on a specific subject or topic if they do not understand or miss important points about that specific topic. For many foreign students whose command of spoken English is quite tenuous, reading is the skill that they most often depend on to help them get through a program of study (Huckin & Bloch, 1993: 153 – 154).

Because reading forms such a crucial part of the learning process at tertiary level, its importance in the reading comprehension process will now be briefly discussed.

2.4 THE IMPORTANCE OF READING IN THE COMPREHENSION PROCESS

Reading is an activity that contributes much to the development of learners' conceptual awareness. Reading and being read to at an early age develops literacy, enhances vocabulary and linguistic skills, instructs the learner about the world close at hand and far away, and encourages creativity and imagination (Hermes, 1995: 6-7). Books also provide learners with language and conceptual acquisition opportunities.

Reading involves many cognitive activities such as evaluating, reasoning, thinking, imagining and decoding. If these cognitive skills are not sufficiently developed, one can assume that the reading comprehension process will be impeded, as information is not incorporated into the student's body of knowledge. The importance of good reading comprehension skills at tertiary level cannot be stressed enough, because they provide the student with access to a great quantity of further experience and language.

Two theories that attempt to explain the importance of reading and cognition in the comprehension process, namely the "bottom-up" and "top-down" theories, will now be discussed. These two theories do no propose that it is necessary for students to know all the vocabulary and grammar items used in a text to comprehend it. Yet, they imply that a lack of knowledge of the meaning of too many words in a text may obscure comprehension and the learning process can be impeded.

2.4.1 The top-down theory of Bartlett

Bartlett's "top-down" theory, also referred to as conceptually-driven information processing, states that when students are reading a text they make use of prior knowledge to make predictions about the information they find in the text. Students fit the text into the cultural, syntactic, linguistic and historical framework that they already possess. This suggests that different expectations and assumptions influence their interpretation of the text (Weaver et al., 1995: 197).

If the student has a basic understanding of the vocabulary of the text, predictions about the content of the text are developed. If the text confirms their expectations, students will ultimately store the information for future use. If not, they will return to the text and re-read it more carefully.

Other researchers who support the "top-down" theory are Mandler and Johnson (1977) and Bower, Black and Turner (1979) (Weaver et al., 1995: 198).

2.4.2 The bottom-up theory of Van Dijk and Kintsch

In 1983, Van Dijk and Kintsch proposed the bottom-up theory as an alternative to schema-based models of discourse comprehension. They state that the reader constructs meaning from the text, starting at the smallest units – from letters to words and from words to sentences. Incoming information is organised hierarchically. According to Van Dijk and Kintsch (1983: 200), this approach assumes that comprehension occurs in cycles, one sentence at a time in order to accommodate the limited capacity of working memory. During each cycle, processing proceeds as follows:

1. The sentence is parsed into individual propositions
2. The propositions from each clause are mapped into a single state or event
3. The relationships among the states and events are encoded

4. If a completely interconnected network of states and events cannot be constructed, the long-term memory is searched for information from earlier in the discourse that preserves the coherence of the representation.
5. A single state or event is selected for reprocessing during the next cycle.
6. Everything, except the selected state or event, is purged from the working memory.

Selecting the state or event that remains active at the conclusion of each cycle is a strategic process that varies from one genre of discourse to another.

Researchers such as Carrell, Devine and Eskey (1988) argue that both the top-down and the bottom-up processes occur either alternately or simultaneously. Students who are good readers make use of both these processes when reading and comprehending, depending on the situation, task and the text itself (Winberg, 1999: 168).

When reading a text, some students may soon realise if they do not comprehend certain concepts that are used. This realisation will let them monitor and evaluate their knowledge by integrating background knowledge or schemata into the text. In this way they can confirm whether the assumptions and deductions they are making from the text are correct or not. This is a conscious process, for the students are aware of the cognitive skills they are applying to try and take control of the comprehension process. This regulation of the thinking process is known as metacognition. Because of its implications for conceptual comprehension, metacognition will now be discussed.

2.5 METACOGNITION

Hugo (1993: 58) defines metacognition as the cognitive activities which are present when a person thinks about his thinking and which regulate this thinking. It differs from cognition in that the person is aware of and has control over his

thinking processes. She also points out that metacognition requires conscious monitoring and controlling of the cognitive processes to plan for the appropriate use of these processes to meet the demands of a situation.

Metacognition is concerned with the process of thinking or the awareness of knowledge about and control and regulation of cognition. This means that the student is aware of himself in terms of cognitive performance; for example, he realises that he is competent in English or that he is a good reader. This implies that the student is aware of how cognitive strategies are regulated and that he can consciously manipulate his cognitive strategies by planning, monitoring, checking and thinking about his linguistic skills. Kokong (1991: 29) states that students in matric should be able to manipulate their cognitive strategies in such a way that what is learned in one subject, for example English, can be applied to another subject, such as History. Thus, metacognition will influence the learning process and academic achievement in the classroom.

Forrest-Pressley et al. (1984: 65 – 66) maintain that metacognitive aspects of language involve the ability to use language skills and to know that there are different ways to express oneself, and that there are rules that make language "sound right". These metacognitive skills are as important as cognitive aspects of language (such as semantics and the use of grammatical rules) as far as decoding of meaning is concerned.

Sternberg (1987) states that metacognition requires a set of processes to be executed. These processes are called metacomponents and include planning of strategy, monitoring and evaluation. These should not be seen as separate processes, as they very often develop or occur simultaneously. In a reading task, for example, a student should be able to plan his reading (e.g. adjust the rate of his reading), use reading strategies (e.g. scanning, selective reading, periodical assessment), monitor his comprehension while reading (e.g. be aware of which parts are not understood, question himself on it and integrate prior knowledge),

and evaluate the section that he or she has already read (e.g. confirm whether assumptions made were correct).

Brown (1987) suggests that metacognitive growth can be facilitated by the use of socialization practices and instructional strategies that encourage students to plan and evaluate their progress and to revise their efforts if unsuccessful.

2.6 THE ROLE OF BACKGROUND KNOWLEDGE

The *Cambridge International Dictionary of English* (1995: 87) defines knowledge as the understanding of, or information about, a subject which has been obtained by experience or study, and which is either in a person's mind or possessed by people generally. Whitehead (1990: 63) proposes that knowledge can be seen like a store of successful encounters with the environment, if based on Piaget's view. Machiels-Bongaertz et al. (1995: 409) maintain that knowledge is what the learner already knows of a certain topic and this determines to a great extent the way in which new information is encoded and retrieved from the memory, that, in turn, serves as a store-house for knowledge. Good students take advantage of such background knowledge in processing the text and in creating an expectation about the kind of vocabulary that will occur. Sometimes the operative background knowledge will not be general knowledge of the world, but specific knowledge of the language or subject matter.

Kokong (1991: 11) maintains that if a student has studied a specific field of study (e.g. biology, science, economics, music etc.) over a certain period, he or she apparently has the experience to label events, actions and principles of that domain correctly. Students who have background knowledge and more content-relevant, high-order conceptual structures should be more adept at learning content than less knowledgeable students. As Kilfoil (1999: 52) puts it: "Basically, it is the topic, the subject matter, that provides the context, not the cues available in the written text". Written cues in the text can contribute to the

understanding of the words, but if the learner has no understanding of the topic, learning is likely to be confined to mere possible recognition of words. Then it is the topic or subject matter that provides the context for the given text and not clues such as the title, endings and introductions. Word knowledge accrues with domain knowledge.

Research conducted by Peterson (1993) indicates that background knowledge contributes primarily to comprehension and not to decoding. The latter refers to the act of converting a message into plain language, not necessarily understanding the message once it has been converted.

Pre-existing knowledge, concepts, beliefs or ideas (schemata) about a subject matter provide a student with a foundation or basis for comparison. Studies by Carrell, Devine and Eskey (1988) verify that students understand more of a text when they understand the content. However, this does not imply that students can only understand what they know. Along with basic information about concepts and language, students need only a reasonable context and some knowledge of the topic to begin to learn (Winberg, 1999: 168). Students can learn to encode appropriately by relating what they are reading in a text with the background knowledge they have already built up previously.

Lambani (2001: 25) states that it seems clear that concepts (simplified as pictures or representations) come into the learner's consciousness not only through experience but also by being named, explained, enriched and expanded by language. The richer and more complex the existing conceptual schemata (a configuration of interrelated features that define a concept), the more easily they are integrated with new and unfamiliar concepts. The opposite is, however, also true: the poorer and more deprived the existing conceptual schemata are, the slower and more retarded the development of new concepts will be (cf. 2.6.1).

As already mentioned, background knowledge can be referred to as schemata. Rumelhart and Ortony (1977: 100) state that schemata may be thought of as "interacting knowledge structures" and the "building blocks of cognition" stored in the hierarchies in long-term memory. They also state that schemata are recognition devices, which carry out a process of evaluation of their relevance to fit the data being processed. Rumelhart (1980: 47) confirms that skilled readers will have a greater number of more completely developed word schemata.

At this point it is necessary to take a closer look at the schema theory which is based on the role played by background knowledge in learning.

2.6.1 Schema theory

Du Plooy (1995: 29) states that knowledge is stored in the memory in schema structures or schemata, which are organised representations of background experience. Garner (1987: 3) defines a schema as an abstract knowledge structure derived from repeated experiences with objects and events. Students can, therefore, understand a text if they are able to find schemata which offer a coherent account of the various aspects of the text. If they fail to find such schemata, the text becomes incomprehensible and incoherent to them. Thus, schema structures not only facilitate both reading and conceptual comprehension but they also provide an interpretative framework for students to use when they read.

If one has to summarise the main points of schema theory, three aspects can be highlighted:

- Texts only provide directions for students on how to retrieve or construct meaning from their own, previously acquired knowledge.

- Comprehending a text is an interactive process between the text and the student's background knowledge.

- The process of text interpretation is guided by the principle that every input is mapped against some existing schemata. The input information must correspond with every aspect of the schemata involved for comprehension to take place. The result of this process is the two modes of information processing namely, bottom-up and top-down processing (cf. 2.4.1 & 2.4.2,).

Carrell (1983) draws a distinction between formal schemata (background knowledge of the formal rhetorical organizational structure of the text) and content schemata (background knowledge of the content area of the text). The latter may sometimes fail to exist for a reader, because schemata are culture-specific. Johnson (1981) and Carrell (1981) have both shown that implicit cultural content knowledge presupposed by a text and a reader's own cultural background knowledge of content interact to make texts whose content is based on one's own culture easier to read and understand than syntactically and rhetorically equivalent texts based on a less familiar, distant culture. Thus the conclusion can be drawn that the absence of content and formal schemata appropriate to a particular text can result in processing difficulties with that text.

It is obvious that background knowledge or schemata interact with conceptual abilities and the cognitive strategies to make learning possible. In the process of trying to understand a sentence, students seem to try to relate the sentence to something familiar. A number of related concepts come to the fore, which are not literally mentioned in the text. Students are then forced to revise their interpretations in such a way that the concepts are made compatible with the information provided in the text to eventually make the entire text coherent and comprehensible.

According to Garner (1987: 7), much of the recent work on vocabulary knowledge is also related to the schema theory. Anderson and Freebody (1979) suggest that vocabulary knowledge is such a strong correlate of linguistic ability, because vocabulary tests tap schematic knowledge, which is so essential to comprehension processes.

Because schemata are so strongly linked to the student's ability to decode and linguistically interpret a text, the study will now focus more specifically on linguistic and decoding ability to establish to what extent these abilities influence the learning process.

2.7 LINGUISTIC AND DECODING ABILITY

Language is a complex phenomenon which consists of interrelated aspects that all play a role in the learning process. Students of a second or foreign language are faced with a difficult task, whether they want to acquire native-like mastery of the language in all aspects, or merely want to learn to read language material in their field of study. They must cope with the complex and abstract system of rules and forms that constitute every human language (Mirhassani & Toosi, 2000: 1). Fluency in a language can only be achieved once the individual gains control over the different components of the language. Comprehension is one of those components. In order to comprehend, one should be familiar with the word formation of the language. Word formation knowledge is a systematic means of increasing vocabulary, which consequently affects comprehension ability.

However, it is one thing to be fluent in a language in communicative situations, but quite different when dealing with the more abstract, formal contextually reduced language of texts, tests, lectures or discussions in any vocational field of study. Decoding now becomes more important. Decoding requires the association of a vocabulary word with its printed configuration, or the association of sounds with letters most often representing those sounds. Letters or letter configurations

should be recognized as the same or different for decoding to take place (Kokong, 1991: 45).

One would expect to find a continual progression in reading and conceptual comprehension skills in English Second Language readers as they become more familiar with the language. The less the student has to concentrate on decoding language, the more attention can be paid to the overall meaning of a phrase or sentence. McLaughlin (1994: 60) reports that research has indicated that good readers use predictive skills based on their knowledge of the syntax and semantics of a language to comprehend a text. The opposite should also be true, namely that poorer readers who cannot yet manage basic predictive language skills have difficulty in extracting meaning from a text. The more advanced reader would probably read by focusing only on essential aspects of the text, whereas the less skilled reader will pay equal attention to each word while reading.

This argument is echoed by Thompson, Tunmer and Nicholson (1993: 140) who state that it is the combination of language prediction skills (syntactic awareness) and emerging phonological recording skills that provides the basis for acquiring basic reading skills.

Previously disadvantaged ESL students at tertiary level may experience difficulty with decoding of English words, because English is often not written phonetically. If decoding is a problem, they are incapable of moving on to the next more advanced step of the learning process, namely comprehension.

The Centre for Research on Education, Diversity and Excellence (CREDE) is a national research and development centre operated under a co-operative agreement between the University of California, Santa Cruz, and the Office of Educational Research and Improvement (OERI) of the U. S. Department of Education (USED) (CREDE, 1997). They have been doing extensive research on the educational excellence of students from all major linguistic, cultural and

ethnic groups from preschool to higher education. CREDE's research focuses mainly on students whose English language proficiency is limited and who, because of this, are at risk of educational failure. This factor, as well as the fact that their research includes students from diverse cultural and social backgrounds, makes their research relevant to this study. Because of the emphasis they place on learning and language, their findings will be briefly discussed.

2.8 GENERIC PRINCIPLES FOR LOW ENGLISH PROFICIENCY STUDENTS

CREDE (1997) conducts research on innovative programmes of school reform for a variety of at-risk children. They have developed a set of five generic principles that provide the basis for their research. Their mission is to assist the population of diverse students, including those at risk of educational failure, to achieve a high standard of education. The five principles are as follows:

- Facilitating learning through joint productive activity among teachers and students
- Developing students' competence in the language and literacy of instruction throughout all instructional activities
- Contextualizing teaching and curriculum in the experiences and skills of home and community
- Challenging students toward cognitive complexity
- Engaging students in dialogue, especially the instructional conversation.

These principles will now be discussed briefly because of their relevance to this study.

2.8.1 Principle 1 – Facilitated learning through joint productive activity among teachers and students

Tharp and Gallimore (1988) and Rogoff (1991) state that learning takes place best through joint productive activity, i.e. when experts and novices work together for a common product or goal, and during the activity have opportunities to converse about it. CREDE (1997) states that in the natural or informal settings of family, community and workplace, shared ways of understanding the world are created through the development of language systems and world meanings during joint activity. Young children and mature adults alike develop their competencies in the context of such activity. The constant connection of schooled concepts and everyday concepts is basic to the process by which mature schooled thinkers understand the world. If the teacher shares in the same experiences as the students, a common context of experience within the school environment is created. This is especially important if the teacher and students are not of the same cultural, social and economic background. CREDE (1997) suggests that content area instruction be integrated into bilingual and sheltered programmes for students with limited proficiency in English and be used as a means of providing a context for language production in English.

2.8.2 Principle 2 – Develop students' competence in the language and literacy of instruction throughout all instructional activities

CREDE (1997) maintains that language proficiency in speaking, reading and writing is the road to high academic achievement. No matter what the language of instruction in the classroom is, the first goal of teaching and learning is language development in the language of instruction. Collier (1995) points out that a strong link exists between language development, academic achievement and cognitive growth. Because of this link, CREDE argues that language development should be a metagoal for the entire school day. Language and literacy development should be focused through meaningful use and purposive

conversation between teacher and students. Language and literacy development should also apply to the specialized language genres required for the study of science, mathematics, history, art and literature, because the ability to achieve across the curriculum is dependent on the mastery of the language of instruction.

2.8.3 Principle 3 – Contextualize teaching and curriculum in the experiences and skills of home and community

Research consistently recommends contextualized instruction, because it utilizes students' funds of knowledge and skills as a sound foundation for new knowledge. CREDE (1997) suggests that contextualization should be addressed on three levels, namely at the levels of instruction, curriculum and policy. This approach fosters pride and confidence, as well as greater academic achievement.

2.8.4 Principle 4 – Challenge students towards cognitive complexity

CREDE (1997) stresses that students who have limited English proficiency need instruction that is cognitively challenging, i.e. instruction that requires thinking and analysis, not only rote, repetitive, detail-level drills. Working with a cognitively challenging curriculum requires the careful levelling of tasks so that students are stretched to reach within their zones of proximal development. The correct balance must be maintained by the teachers so as to avoid overwhelming challenges that are discouraging to students.

2.8.5 Principle 5 – Engage students in dialogue, especially instructional conversation

CREDE (1997) suggests that instructional conversation is the means by which teachers and students relate formal, schooled knowledge to the student's individual community and family knowledge. Basic thinking skills, such as the ability to form, express and exchange ideas in speech and writing, are also

developed most effectively through dialogue. If teachers construct lessons from common understandings of their and their students' experience and ideas, they make teaching a warm, interpersonal and collaborative activity.

These principles are intentionally generic and in all likelihood there will be situations and individuals for whom they should be modified. Yet, they form a sound basis for effective teaching and learning, also in South Africa due to the fact that they spring from research on at-risk children, i.e. those whose English language proficiency is limited and who come from economically disadvantaged areas. Achieving success for all students in a rigorous curriculum of study, demands integrated attention to teachers and students, as well as content and standards, i.e. to all components of the classroom core.

2.9 CONCLUSION

A basic assertion is that effective and meaningful learning can only occur if the text that is read is comprehended by the student. Reading at tertiary level is the one skill that is often used to interpret the world, studies and the educational environment as such and, therefore, students need to be taught reading strategies to extract content meaningfully. Closely related to this is the possession of well-developed cognitive skills, because the student who is able to actively process information and apply this information after critical evaluation is often successful in tertiary studies.

Possessing background knowledge about a subject matter will provide a student with a basis for comparing new knowledge in a text to what he or she already knows. However, owing to disadvantaged socio-economic and educational circumstances many disadvantaged ESL students do not have this advantage and the learning process is impaired.

It has also been pointed out in this chapter that students need to have adequate language skills in English if they wish to continue their studies at tertiary level through English as instruction medium. If their language skills are rudimentary the reading process itself is restricted and vocabulary is not extended. It is often with the abstract, formal contextually reduced language usage of academic texts that the disadvantaged ESL student struggles. These students are often not familiar with English word formation knowledge and although they can express themselves in a communicative situation, it is often not the case in formal academic situations. Decoding has to take place first before comprehension does and if students cannot decode English words, it is impossible to move on to comprehension.

Because conceptual knowledge as a basis for reading with comprehension forms an integral part of successful tertiary studies, chapter three will focus more specifically on conceptual awareness, concept formation and deciding factors that contribute positively to conceptual comprehension.

CHAPTER 3

THE IMPORTANCE OF CONCEPTS IN LEARNING

3.1 INTRODUCTION

Vocabulary acquisition takes place over a period of time. Since primary school the student is constantly and systematically exposed to new word meanings in various fields of study. However, exposure to new word meanings must be multiple and there should be links between the new words and what the student already knows before vocabulary acquisition can be regarded as effective.

Knowledge about words forms a semantic web of relationships, with links to other words, to the specific domain or field of study and possibly to wider schemata. Knowing a word's meaning implies knowing the concept that underlies the word (Kilfoil, 1999: 52).

During the comprehension process the student samples, predicts, confirms and ultimately integrates text. If the student manages to fit the total meaning of the passage into a network of information organised in ways meaningful to his or her society, comprehension has occurred. This is only possible if the student was able to find a configuration of schemata (prior knowledge or pre-existing ideas, beliefs and concepts) which offers a coherent account of the various aspects of the text. Possessing accurate schemata related to the material being read, leads to more effective comprehension of the text (Du Plooy, 1995: 29).

When studying at tertiary level, students are faced with language on a fairly advanced level and with a stream of incoming concepts and information. Inadequate conceptual knowledge or lack of prior conceptual knowledge will obstruct the comprehension process. The reason is simple: there is no pre-

existing knowledge data base to link the new information to, therefore, the student fails to put together the text within a personal framework of knowledge. He or she is left with loads of incomprehensible word meanings to deal with. Because this new information is meaningless, the student cannot retain it in a form suitable for constructive thinking. Many students try to deal with this problem by learning pages from the textbook by heart and presenting them in the same form during examinations and tests, totally disregarding the different nuances of different examination questions, especially those requiring insight.

This chapter first focuses on a definition of concepts and the various steps in the process of concept formation, namely word recognition and decoding. This clarifies how concepts are formed in the minds of students. Secondly, the emphasis shifts to three factors that play an important role in conceptual awareness namely, vocabulary knowledge, context and the role of the mother tongue (L1) in concept formation.

3.2 DEFINITION OF CONCEPTS

For the purpose of this study it is necessary to clarify what a concept is. A concept stands for a class of objects and not a specific entity, for example, the concept of *communication* requires an individual to see beyond the picture of two people talking to each other. He or she must know the attributes of *communication* and be able to apply these correctly to pictures of people who write, speak on the telephone, think and use gestures, for these situations also qualify as *communication*.

Concepts are elusive since they cannot always be completely known, for example, compare merely knowing the game of tennis by being able to distinguish it from all other ball games to knowing it from first-hand experience to knowing the history of the game. Getting to know a concept in its entirety implies that

concepts should not only be learnt, but they should continually be refined and extended.

Whitehead (1990: 73) defines concepts as flexible ranges of options that help learners to impose some order and pattern on the complexity and diversity of raw experience. He maintains that a concept may start its slow growth from a picture book label, a simple toy or even the experience of being held up to look out of a window by an adult. Swart (1988: 268) echoes this view when stating that the most fundamental meaning of the term *concept* is exhibited in individual behaviour. He maintains that the individual responds to a class of observable objects or object qualities such as those implied by words. These are, for example, colour, shape, size, heaviness etc. or by common objects such as *cat, dog, house, table* etc. According to him, learners acquire concepts by observation and by definition. Therefore, the experience (received within their learning contexts by means of observation and interaction with more experienced learners in their learning contexts) that learners have helps them to understand the issues more clearly. Richards et al. (1992: 74) define a concept as the general idea or meaning that is associated with a word or symbol in a person's mind. All of these definitions seem to stress that concepts are abstract meanings associated with a word or other linguistic item.

Linguists believe that all languages can express the same concepts, although some languages may have fewer words for some concepts than are found in other languages, or they may distinguish between concepts differently (Lambani, 2001: 23). The problem that disadvantaged (especially Black) students at colleges in South Africa face is that they often either have no knowledge of underlying concepts for scientific, commercial or technological phenomena or lack a word or equivalent in their mother tongue, although the concept may exist. Thus, they are faced with the dual problem of concept development and labelling of concepts.

Much school learning is based on second-hand experience conveyed through language, and in the case of this study, English as a second language. The students in this study have all switched from mother tongue instruction to English medium instruction in Grade 5. Although they have been exposed to English as a medium of instruction over a lengthy period, their conceptual comprehension may still be rudimentary if they have failed to develop the ability to remember, perceive, recognise and classify (not only in their mother tongue but also in English).

3.3 CONCEPT FORMATION

Concept formation is an essential part of learning, for it enables the reader to classify a complex world economically, and thus organise it into more easily manageable categories (Rude & Oehlkers, 1984: 230). Lambani (2001: 23) states that the forming of concepts is closely related to language acquisition, and the use of concepts for form propositions is basic to human thought and communication. Language, therefore, is used as a vehicle through which information is disseminated.

Stories told to children in the lower grades very seldom contain concepts that are beyond their comprehension. It is when exposed to expository material encountered in the text books of social studies and science that these students, who seemed to breeze through the primary grades, may find it difficult to read with understanding. The role of the teacher now becomes more significant, because he or she must teach students about concept formation. Rude et al. (1984: 231) suggest the following three steps when teaching concept formation to students:

- Determine the student's experience with the concept.
  The teacher should identify important concepts in a particular selection of the textbook and determine which ones are prerequisites for comprehension.

- Examine the student's experience with the concept.

  The teacher should determine how well students already understand these concepts as students' backgrounds may differ and not all students will need the same instruction. Students should be helped to examine their experiences with concepts through observation and language. Swart (1988: 27) stresses the role of the teacher in this regard when stating that the conceptual framework of the learner should be built up throughout his life through spontaneous experiences and experiences planned by the teacher.

- Connect the new information to previously existing concepts.

  New concepts should be related to those already known by the student to build on the experience. Students can be asked to list the attributes of the concept.

Concept formation is particularly crucial in dealing with subject matter material and must often be taught before reading the text. If the student has gone through the three basic steps outlined above, conceptual comprehension is more likely to occur.

Brown (1987: 48) claims that conceptual development is a process of progressively moving from states of mental disequilibrium to equilibrium. He adds that periods of disequilibrium mark virtually all cognitive development through ages fourteen and fifteen. This is when formal operations (as noted by Piaget) are finally firmly organised and equilibrium is reached. More importantly, he points out that language interacts with cognition to achieve equilibrium or balance.

Whitehead (1990: 73) states that the development of concepts is affected by personal life experiences, cultural traditions and the subtle process by which any new information, new experiences and new words are matched to and integrated with the already experienced, named and known. When new concepts are reconciled with existing schemes, conceptual capture takes place.

More attention will now be paid to the recognition of words and decoding as part of the process of concept formation.

3.3.1 Word recognition and decoding - the process of concept formation

The first obvious component of conceptual comprehension is the recognition of words. The printed words that the student encounters must be associated with familiar concepts stored in the long-term memory before they will be recognised. These concepts will also include knowledge of how the words must be pronounced. According to Perfetti (1982), Rahman and Bisanz (1986) and Pearson (1984), these recognition processes involve access to mental representations of words, i.e., schemata, and, therefore, this general component of the conceptual comprehension is referred to as lexical access (Kokong, 1991: 45). If the recognition process has been successful, the student will be able to employ strategies that activate his storage by retrieving the concepts from his memory and by using them in appropriate situations. This is known as the production stage. Thus the students will understand or comprehend the concepts used in a given text. Because these concepts are understood, they are stored and committed to memory.

From the above mentioned statements it is clear that conceptual comprehension relies on both recognition and production. Carter and McCarthy (1988: 62) refer to researchers such as Asher (1969) and Postovsky (1974) who believe that comprehension should precede production in language teaching. They believe that students must first be taught to understand what unfamiliar words mean before these words can be retrieved from memory and be used later on in an appropriate situation.

Researchers such as Just and Carpenter (1980) found that a considerable amount of the variance in reading rate and how long learners look at individual words is accounted for by variables that influence simple word recognition tasks such as

word length and word frequency (Balota, Flores d'Arcais & Rayner, 1990: 2). The underlying grammatical structure of a text also influences the ease or difficulty of understanding it. Recent research clearly points out that syntax (sentence construction) specifically plays a very important role in the comprehension process and that word order plays a central role in syntactic parsing (classifying parts of speech in a sentence).

Researchers basically propose two general types of mechanisms to explain how word recognition works, namely phonological coding and direct access. A brief discussion of each follows.

3.3.1.1 Phonological coding

This hypothesis holds that word recognition is accomplished by converting the graphemic representation of a word (which is coding of its sequence of letters) into a phonological representation (which is coding of a corresponding string of phonemes based on the word sequence of letters). The latter is then used to gain access to the meaning of the word as represented in the appropriate entry in the mental lexicon, which in turn, has already been organised by phonological codes through the process of language acquisition (Thompson et al., 1993: 6).

In English, this way of recognising words can be problematic when faced with words which sound the same but look different, e.g. *night* vs. *knight* and words that are spelt the same but can be pronounced differently, depending on the context in which it is used, e.g. *read*. According to Juel, Griffith and Gough (1986), this difficulty can be solved if the student's cipher knowledge (knowledge of letter-sound correspondence rules) is supplemented by specific lexical knowledge which can only be gained through experience with print (Thompson et al., 1993: 6).

3.3.1.2 Direct access

This hypothesis proposes that word recognition is accomplished by mapping the graphic representation of the word directly into its representation in the mental lexicon. This view can be applied to non-alphabetic orthographies such as Kanji in the logographic system within Japanese, as it explains how sense is made of a word without using phonemes or letter sounds (Thompson et al., 1993: 7).

If looked at in a simple way, word recognition is the general term for accessing the mental lexicon based on graphic information, while decoding refers to word recognition accomplished through phonological coding. However, neither word recognition itself, nor decoding in itself is sufficient for successful conceptual comprehension. Word recognition (a lower level process) must be fast and automatic so that not too much effort goes into it lest the resources needed for comprehension (a higher level process) are used up in the process (Oakhill & Yuill, 1991: 71). The skilled learner must be good at both decoding and comprehension, because decoding in the absence of comprehension will not result in learning. Learning can only take place in the presence of word recognition, decoding and comprehension.

3.4 FACTORS THAT INFLUENCE CONCEPTUAL AWARENESS

Vocabulary obtained from multiple exposure to the printed word provides the student with a data base for interpreting the text. Furthermore, one must never underestimate the influence of the student's mother tongue (L1), as concept formation and awareness in the second language are often dependent on and supported by the development of the student's first language. Last, but not least, the context in which a word appears in a text helps the student to approximate its meaning. These factors will now be discussed in an attempt to point out to what extent each one of them influences conceptual awareness.

3.4.1 Vocabulary knowledge

Vocabulary terms can be defined as those terms or words that students know the underlying concept for in their first language, but for which they lack a word in their second language, namely English (Rude et al., 1984: 228). Young children may know a concept, but be unfamiliar with the appropriate vocabulary terms.

Nagy and Herman (1987: 25) argue that even a single encounter with a word in context could help move it a little bit higher on the scale of knowledge. There has been some disagreement about precisely how many encounters with a word would be sufficient to ensure its acquisition, but many researchers put it somewhere between six and twelve (cf. Jenkins & Dixon, 1983).

Brown (1985: 265) states that the variety of contexts in which a word appears, as well as its saliency or importance plays a significant role in vocabulary acquisition. She also maintains that instructional focus is one way of stressing the importance or saliency of a specific word or concept. Instructional focus takes place if a teacher explicitly teaches a word or concept or gives exercises in class where students have to use the word.

It is also common knowledge that students learn new words through multiple exposure and experience. Hatch, Flashner and Hunt (1986) point out that experience may cause learners to recognize that they do not possess a particular piece of linguistic information (e.g. a concept) that they need in order to communicate. Learners recognize a gap in their knowledge. In future experience learners may encounter the same piece of linguistic information or concept they needed before. Because this gap was recognized before, the linguistic information now being encountered is regarded as salient or important and it has a greater potential for being acquired.

Kilfoil (1999: 52) maintains that the focus should be on developing students' vocabulary systematically, extending the meanings of words they already know in natural English, focusing attention on the academic layer of language, highlighting words that have different meanings in different contexts and teaching subject specific terminology.

According to Carter et al. (1988: 12), the more words are analysed or enriched by imagistic (precise, concrete images) or other associations, the more likely new vocabulary is to be retained. They also state that the more opportunities found for formal transfer between the foreign or second language and the mother tongue words, the better the chances for retention.

Various techniques for teaching vocabulary exist. Students need not look words up in a dictionary constantly, but they can also be taught to understand word meanings by comparing and contrasting words with other words. Familiar synonyms and antonyms can be used for comparison purposes. In literate societies reading becomes an important source for learning new words. Vocabulary instruction should ultimately bring students to understand new concepts.

Nagy (1989: 21) suggests a few methods of teaching new concepts to students through vocabulary instruction. These are:

- Start with instruction or a discussion of the meaning of the word without mentioning the word itself.

- Consider examples and non-examples and discuss why the new word applies or does not apply in each case.

- Ask students to generate examples and non-examples which will connect the word with familiar concepts and experiences and bring to light possible misunderstandings.

Increasing vocabulary knowledge is a basic part of the process of education, both as a means and as an end. Lack of adequate vocabulary knowledge restricts conceptual comprehension, ultimately restricting the learning process. Advances in vocabulary knowledge will create an ever-increasing pool of concepts and words that a student must master to be literate and employable.

Word meanings can also be made clear in relation to other words used with them in a sentence or paragraph. In this way a student can extend his vocabulary knowledge. The role of context in conceptual awareness will now be discussed more extensively.

3.4.2 Context

"Learning vocabulary through context must be a major way of increasing vocabulary knowledge" (Carter et al., 1988: 109). Context refers to the portions of discourse that immediately precede and follow and are connected within a text, i.e. the meaning of words as they become clear in relation to other words used with them in a sentence or paragraph. This type of incidental vocabulary acquisition can be very valuable because a student encounters new words in meaningful contexts and repeatedly in different contexts.

Sternberg (1987: 92) points out that multiple occurrences of an unknown concept increase the number of available cues and can increase the usefulness of individual cues if learners integrate information obtained from cues surrounding the multiple occurrences of the word. Guessing the meaning of words from context is one of the most frequently used ways to discover the meaning of new words. Cues can be provided by the title or topic which provides an outline of

what the student is about to read. Further cues can be provided by other words in the text, grammatical structure and punctuation. If the concept is judged to be necessary for understanding the surrounding material in which it is embedded, the learner's incentive for figuring out the word's meaning is increased (Sternberg, 1987: 93). Students must, however, be well equipped and skilled in decoding or inferencing before new concepts and words will be ultimately retained by relying on contextual clues.

Learning new words and making sense of a text by guessing word meanings from context can be done by looking for certain clues. Only two such clues, namely the title and introductions and endings, will be discussed briefly to clarify the role that they play in context.

3.4.2.1 The title of a text

The title or heading of a text can aid comprehension by providing a context or framework within which to interpret events and actions mentioned in the text. In this regard Cornoldi and Oakhill (1996: 182) mention that research by Dooling and Mullet (1973) has proved that adults' comprehension and memory of obscure texts are improved by the presence of a title. The informative type of title provides a framework in which to interpret the text. This aids a less skilled learner as he or she is often not skilled at selecting and organizing ideas to make sense of a text.

3.4.2.2 Introductions and endings

Introductions and endings are also helpful clues. Cornoldi et al. (1996: 184) mention that comprehension could be impaired by not knowing how to interpret introductory information as a context setter. Knowing how to interpret introductions helps the reader to relate different issues or episodes into structures.

Additionally, endings are often used as a summary device to reiterate the main idea, wrapping things up. Obviously, the more skilled learner will have a more stable and explicit awareness and understanding of these clues and will, therefore, be more likely to use and to be guided by introductions and endings when studying a text.

However, it is important that the learning content must be relevant to the learner. It has to be presented in such a way that students recognize it cognitively and functionally as of interest to them. If the content is irrelevant to them and it is provided via a language (in this case English) in which they lack proficiency, learning is not likely to take place (Lambani, 2001: 42).

3.4.3 The role of the mother tongue (L1) in conceptual awareness and concept formation

Language is an integral part of the cognitive development of the child. Knowledge of sounds enables children to form words, while knowledge of semantics and syntax contribute to their comprehension of texts. Although concept formation can be regarded as a cognitive-neurological matter, it is intertwined with the language which is allocated to the concept as a symbol (De Witt, Lessing & Dicker, 1998: 119). By acquiring language skills and attaching meaning to concepts, the child enters the world of the symbol with sound and meaning.

According to De Witt et al., (1998: 119) language can also be seen as an aid in the processing of the higher-order thinking processes such as memory, discrimination and reasoning. People speak and think by means of concepts. To use a language meaningfully requires adequate concept formation as a basis for communication (De Witt, et al., 1998: 119). It is also generally believed that learning a second language is dependent on and supported by the development of the student's first language. Various factors such as socio-economic conditions, life experiences

and individual differences influence the rate at which a second language is mastered. Piaget (1946), however, postulates that children's language development is determined by their existing knowledge of the world. This knowledge is acquired by cognitive development (De Witt, et al., 1998: 119). Thus, mastering a language depends on accumulated knowledge and active input to acquire more knowledge. It is, therefore, clear from this argument that cognition and cognitive skills play a direct role in the mastering of a second language.

De Witt et al. (1998:120) believe that the connection between mother tongue and cognitive development differs from that of the second language as the second language student has already formed concepts or thinking structures in the mother tongue. As far as concepts are concerned, the student sometimes has to make changes in the concepts that have been formed and accommodate new meanings in the second language.

The structures and vocabulary of a student's first language are laid down over an extensive period. First, at basic level from oral input and later on at subordinate and super-ordinate levels, thus increasing both the quantity and quality of words known (Kilfoil, 1991: 47).

In South Africa the situation for most disadvantaged students is a unique one. Learners change from L1 medium of instruction to English (L2) as a medium of instruction in Grade 5. Statistics have shown a high drop-out rate after Grade 5 (De Villiers, 1997: 223). Basic reading skills in the first language are often not yet properly established at this early stage and students are confronted with English as a second language with its own structures and vocabulary.

According to Goldman and Trueba (1994: 35), additive bilingualism is also associated with the ability to transfer skills and information across languages and also with possible enhancement of cognitive skills. Other research studies,

involving a number of populations around the world, have found evidence suggesting that proficient knowledge of two language systems enhances cognitive flexibility and metalinguistic skills (Lambert, 1977; Cummins, 1978; De Avila & Duncan, 1981; Hakuta & Diaz, 1985). Cummins (1981) has suggested that cognitive benefits of bilingualism can emerge only after individuals acquire sufficient proficiency in any one language to permit cognitively demanding language use. Once such a level of proficiency has been attained, bilinguals are allegedly capable of transferring learned information with facility across languages – a skill that can be extremely useful when one receives tertiary tuition through the medium of second language instruction.

Kilfoil (1991: 47), however, mentions that in scientific and technological fields there is no recourse to bilingual semantic memory, as the mother tongue has not been developed for these purposes. This is true of many Black languages spoken in South Africa.

Another point worth mentioning in this regard is McLaughlin's (1994) observation that the automated skills in the first language facilitate the development of corresponding second language skills when the scripts of the two languages are the same or quite similar in their visual and orthographic (spelling) characteristics. However, when comparing the two main languages concerned in this study, namely Setswana and English, they show very little resemblance as far as their visual and orthographic characteristics are concerned.

There are specific ways in which teachers can use a student's first language to facilitate instruction, create understanding and build rapport. Guthrie and Guthrie (1991) point out that the mere use of the first language in class is not the issue; it is how the bilingual teacher uses the student's language that is important. Once again, a problem arises in South Africa. Most college lecturers teaching Black ESL students are not at all familiar with Setswana as the student's first language. It is only the lecturer whose mother tongue is also Setswana or the one who can

speak Setswana, even if it is not his mother tongue, who can facilitate instruction for students in this way. Then there is still the problem of Setswana not being developed sufficiently for scientific or technological purposes. For tertiary studies, the student still has to comprehend and represent his work in English to obtain a qualification.

It seems clear that concepts and knowledge already acquired in the child's mother tongue have a specific influence on the acquisition of a second language, as second language learners tend to accommodate new information in their existing frame of reference in the mother tongue. Therefore, well-established concepts in the mother tongue form a sound basis for the acquisition of new information in the second language, as parallels can be drawn between the first and second language.

3.5 CONCLUSION

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 (Kokong, 1991: 19). For a student to be able to attain this ability he or she must acquire and perfect a complex set of processing skills that allows for rapid processing of incoming material and extraction of meaning, namely, word recognition and decoding skills.

A pre-existing knowledge base of schema and vocabulary gives students a means of measuring new incoming words. If they can link the new words to a personal frame of reference, the new information will not be lost, but be stored. The context in which a word appears also helps the student to guess its meaning so that it can be stored meaningfully for future use. Prior knowledge and concepts stored within the student's existing frame of reference tend to be in the student's first language or mother tongue. If new concepts are learnt in the second

language and they are to be stored, they will probably be compared to the existing ones in the mother tongue first.

It is clear that learning a second language involves many factors that should be satisfied before learners become fully proficient. Conceptual acquisition seems to be inseparable from language proficiency, as the latter also assists learners in developing difficult cognitive processes. Learners can only match what they learn in classrooms to what they already know, i.e. learning content should link with the familiar environment of the learner (Lambani, 2001: 58).

Chapter four will focus on external factors that may influence conceptual awareness.

CHAPTER 4

FACTORS THAT MAY INFLUENCE CONCEPTUAL AWARENESS

4.1 INTRODUCTION

Students come from a specific culture, family, socio-economic and educational background. Factors such as age, intellectual ability, language proficiency, motivation and attitude towards their studies all play a part in the student's ability to cope successfully with tertiary studies.

For the purposes of this study, this chapter will focus on personal and contextual factors that may influence the previously disadvantaged ESL student's level of conceptual comprehension at tertiary level. For the purposes of this study the personal factors that are discussed include socio-linguistic factors, namely language proficiency and background knowledge. Cultural orientation, age and motivation are also discussed. The contextual factors that will be discussed include socio-economic background (including exposure to electronic media), educational background, exposure to English reading material and the role of English as medium of instruction in secondary school classrooms.

Although there are many variables that influence conceptual awareness only a few factors have been selected in order to obtain a general impression of the participating students' background.

Day et al. (1998: 2-3) state that South Africa compares unfavourably with several other middle-income countries regarding adult illiteracy. Race, gender and geographical location within the country all play their part regarding these issues. Lambani (2001: 30) states that students from poor socio-economic backgrounds and cultures other than the dominant one in schools struggle to acquire concepts because they do not possess adequate conceptual knowledge. At tertiary

institutions in South Africa, the learning material is predominantly based on Western concepts. A brief profile of the previously disadvantaged Black ESL student will now be given. The current profile is aimed at putting the previously disadvantaged ESL student's standard of secondary education into perspective, as the aim of this study is not to show direct correlations, but merely to point out factors that may play a role in the students' interpretation of the concepts that were tested.

4.2 A PROFILE OF THE DISADVANTAGED ESL STUDENT

Edmunds (1987: 25) states that very often the secondary education of Black students in rural areas is associated with socio-economic deprivation, inadequate school facilities, severely underqualified teachers insecure of their English and cultural differences which make it difficult for disadvantaged ESL students to absorb an essentially Western-based system of education. A significant proportion of these problems can be traced back to poverty and to the inequality and separatist provision of South African education in the past.

Most disadvantaged children are taught in their mother tongue until the end of their fourth year of school. In Grade 5 they switch to English as medium of instruction. As a result of their own poor English proficiency, many teachers resort to audio-lingual practices, rather than communicative classroom practices (Brown, 1987: 49; De Villiers, 1997: 232 – 233; NAP, 1999: 215). Consequently, pupils have few opportunities to use the target language for problem-solving activities or in open-ended tasks, as the unstructured nature of such interaction challenges the proficiency of the teacher. Students are usually not encouraged to enquire critically about matters and as a result they use memorized knowledge in a passive manner (Butler, 1998: 27).

In South Africa, subtractive bilingualism, high levels of illiteracy in rural communities, under-qualified teachers lacking proficiency in English and a lack

of funding have produced what Kilfoil (1999: 47) refers to as "semilinguals", incapable of functioning effectively at tertiary level.

The Human Sciences Research Council (HSRC) reports in a series of nine provincial publications (HSRC, 1998) on the condition of primary and secondary education in South Africa. The School Register of Needs Survey, an HSRC research project conducted at 32 000 schools countrywide, revealed that the standard and conditions of education in at least eight of the nine provinces are less than favourable.

Factors that contribute to these findings are:

- high learner : educator ratios (even as high as 50:1 in certain districts in Kwazulu Natal);
- classroom shortages;
- a lack of resources such as media equipment, media collections, general equipment, learner desks and chairs;
- poor supply or a total lack of specialized facilities such as libraries and laboratories;
- an inadequate supply of textbooks and stationery;
- poor supply or a total lack of telecommunication facilities, electricity, running water and sanitation facilities.

Data on certain socio-economic variables such as the availability of electricity and running water in the house, water-borne sewerage and a separate bedroom for the learner, proved that, on average, the North West Province was worst off compared to the rest of the country. The percentage of over-age learners (i.e. three or more years older than the average for the grade, with the average for Grade 1 being seven years) ranged between 17% (Kwazulu Natal) and 33% (Free State). In North West more than 26% of learners in the secondary grades were over-aged.

From the above it is clear that the physical infrastructure needed to support learning and teaching in South Africa is still far from favourable. Although there has been an improvement since the publication of these reports (especially regarding electricity supply, running water and sanitation) the educational background of the previously disadvantaged ESL student still leaves much to be desired.

The study will now focus on personal factors which may influence the disadvantaged ESL student's level of conceptual comprehension.

4.3 PERSONAL FACTORS

As already pointed out in Chapter 2, cognition cannot be separated from conceptual comprehension, because a student's cognitive skills have a direct influence on his or her ability to comprehend.

Van der Westhuizen (1986: 64) maintains that various factors influence learners' achievement in English, of which intelligence, previous achievement, aptitude and reading ability are the most important.

Littlewood (1984: 64) stresses the importance of individual cognitive styles, i.e. the learner's distinctive way of dealing with perceptual and intellectual activities. He adds that some learners prefer inductive methods of learning, whereas others prefer deductive methods. This implies that some learners will be more rule- and structure-bound in their approach to learning, while others may be more creative and more willing to experiment with the application of certain language aspects.

According to Kokong (1991: 10), student characteristics are divided into two main classes, namely, cognitive behaviour and affective characteristics. Cognitive behaviour entails experience and ability which imply the extent to which the student has already learned the basic prerequisites for the learning

process to be undertaken. Affective 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. Kokong (1991: 11) also states that age-related changes in student cognition, across the period ranging from early childhood through adolescence and college years, proceed along a number of dimensions. These dimensions include self-awareness, metacognitive proficiency, memory and thought processes and effective cognitive capacity. During this period students additionally acquire increasingly sophisticated learning strategies, deployment skills and knowledge of the range of their utility.

The more students are exposed to a specific learning demand or goal and the more they have made use of a particular learning strategy to master the goal, the better their chances of mastering that specific learning goal or demand. This emphasizes that the learning process involves the integration of new information with a pre-existing information base. However, if a student's language proficiency is poor or limited, the learning process is also hampered (Landman, 1985: 57). The potential tertiary student's English language proficiency must be adequate as English is the medium of instruction at most tertiary institutions in South Africa today.

Language proficiency and background knowledge, as the two main socio-linguistic factors that may play a role in conceptual comprehension, will now be discussed.

4.3.1 Socio-linguistic factors: Language proficiency

Rice (1990: 1) maintains that a direct relation between cognition and language exists, i.e. the development of language skills and comprehension is an intertwined process. He adds that opportunities must be created for the student to practise and develop his linguistic skills. In this regard, De Villiers (1991: 39)

states that the child must first be exposed to the target language and be able to comprehend it before he can be expected to experiment with it.

Compared to first language acquisition, second language acquisition often lacks strong motivation within the learner due to the fact that pressure from the social environment to acquire a second language is not as strong. The learner can already interact with his parents and other people in his first language (De Villiers, 1991: 32). Therefore, one can say that a second language will only be learned if the learner can actually use it in his social environment. If a student is positive towards English as a second language he or she will be much more inclined to master it. English is widely perceived as instrumental in preparing learners to meet the demands of an increasingly international job market (cf. Nwaila, 1992: 6; Van Dyk, 1993: 187; Klein, 1994: 27). The better the student's perception and handling of the language, the stronger the feeling of having control over word recognition and the better the chances for generating knowledge from the text.

In South Africa, English is an important medium of instruction in tertiary study. Landman (1985: 57) points out that lack of English proficiency at tertiary level will hamper the student's joining the labour market. Widdowson (1978: 74) emphasizes the importance of recognizing the meaning of the learning content for immediate needs, because this will ultimately motivate a student to acquire the second language.

4.3.2 Socio-linguistic factors: background knowledge

All potential tertiary students who enrol at a tertiary institution already possess background knowledge which include general knowledge of the world and specific knowledge about subject matters and language. It is the latter that enables students to label concepts of a specific subject field correctly because the information is stored in the long-term memory until the student has to recall it to

relate it to new concepts (Kokong, 1991: 11). Kilfoil (1999: 52) maintains that the more knowledgeable a student is with words, i.e. language and vocabulary, the more his conceptual knowledge on a subject matter will increase. This means that language proficiency and background knowledge are interdependent and cannot be separated.

Background knowledge basically acts as a recognition device that helps to facilitate conceptual comprehension. Thus, students' level of subject-specific background knowledge influences their comprehension of concepts in that subject. If they fail to relate new concepts successfully to their existing background knowledge, their conceptual comprehension is impeded.

4.3.3 Cultural experience

According to Mclean and Goldstein (1988), it is virtually impossible to predict which concepts an individual will be able to comprehend unless we know something about that person's background knowledge and cultural experiences. People tend to exhibit different performances in different contexts, since interest, motivation, intention and the like all play a role.

McLaughlin (1994: 66) points out that discourse comprehension involves the construction of mental models synthesized from text information and general knowledge by the reader. To the degree that a segment of discourse makes contact with the reader's schema-based general knowledge, the information can be used to construct a mental model that is much richer than the information in the text. However, real-world knowledge that is assumed to provide the basis for generic schemata differs from culture to culture. Children whose cultural experience differs from the mainstream culture assumed in school reading material may make schema-driven inferences not justified by the text. In other words, reading texts are interpreted from a certain cultural perspective and

problems may occur if the reader's culture is different from the culture underlying the text.

Background knowledge is very often culture-specific and culture-specific values may be significant to conceptual comprehension if the values expressed in the text differ from those held by the student. A familiar cultural schema can be very powerful indeed if the student wishes to have a complete understanding of the meaning of the language that is used in the text (Du Plooy, 1995: 20).

4.3.4 Age

According to Kennedy (1970), the older a student, the more experience he has been subjected to regarding certain cognitive factors such as cognitive maturity, longer attention span and a longer short-term memory. Older learners are also more prone to use complex and sophisticated strategies to process information they are subjected to (Du Plooy, 1995: 19).

Faerch et al. (1984) are of the opinion that the younger the student, the easier and better he acquires a foreign language. According to them, other factors that also play a significant role in this regard are the intensity of learning, the total time spent on learning the language, the development of linguistic skills in the mother tongue, intellectual ability and motivation. Wilkins (1974: 51) emphasizes the importance of determining what students know before determining what information they should be exposed to, because students, although of a similar age, may not all be on the same level of proficiency.

It seems that age in itself is not a determining factor of conceptual comprehension, but that it forms part of an integrated network of various cognitive, linguistic and social factors.

4.3.5 Motivation

According to Skehan (1990: 281), motivation refers to the choices that learners make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert to reach those goals. If a student is positive about the text and motivated to get something from it, he or she will be much more actively involved in the text and will probably use a variety of strategies which leads to optimal learning. Gardner and Lambert (1972: 56) found that language proficiency gives a clear indication of learners' achievement in the target language, but they also acknowledge the importance of motivation.

Achievement also motivates students to perform better and to show more interest in their tasks. A positive attitude has a far-reaching effect on a student's performance and should be fostered by an attitude of acceptance by both lecturer and parents. Younger learners seldom seem to resist learning a second language, but they need to believe that they can be successful in learning English and learning through the medium of English (De Villiers, 1997: 22).

There seems to be a lot of truth in Edge's (1993: 15) statement that the key to learning is motivation. Cornoldi et al. (1996: 302) furthermore state that if a student experiences the task or the learning process as meaningful, he or she will be able to cope with it in a motivated, autonomous way. Motivation can also be applied extrinsically to students' choice of tertiary course. If students believe that the course they choose will provide job opportunities or job satisfaction, chances are that they will be motivated to study harder and make a success of their studies. This aspect is considered in chapter six where students had to indicate what motivated them to choose a specific course. Motivation is not only a means to achieve a goal, namely to generate knowledge, but it is also a goal in itself.

4.4 CONTEXTUAL FACTORS

Whereas the personal factors discussed above form an intrinsic part of the individual student himself, contextual factors can be related to the student's educational, socio-economic and cultural circumstances and experience. Specific contextual experiences or types of literacy instruction may be required for the development of metalinguistic ability. Basic decoding skills, phonological awareness and general reading and spelling skills fail to be developed properly if students are not stimulated through multiple exposure.

Seen against this background it is not impossible that Black ESL South African students who come from a disadvantaged educational background with inadequately-trained teachers will be at a disadvantage when enrolling for tertiary study (cf. 4.2). This is particularly true of students who come from rural areas. The role that geographical location may have on the previously disadvantaged student's conceptual awareness will now be discussed.

4.4.1 Socio-economic background

The students who participated in this study come mainly from rural areas and they attended schools in rural areas. Exposure to adequate facilities such as libraries, Internet, television and English reading material is often limited compared to that of their urban counterparts (Elley, 1992: 63).

According to Scott-Jones (1984), the nature of the physical setting in which the family lives may have an influence on the student's cognitive development and school achievement as a child. For example the classroom context, the teaching and learning aids that the teacher and pupils use to make learning effective, instructional materials and teacher-pupil relationships also have an influence on the comprehension skills of the child.

Urban students also enjoy an educational advantage above their rural counterparts. Schools in cities usually have better resources and better qualified teachers, and more amenities are often available to the students. The effect of these advantages is reflected in higher achievement levels for urban children, especially at secondary school level (Elley, 1992: 63). Students who come from an urban environment equipped with all these advantages will perform better at tertiary level and they will be more proficient students in general.

In South Africa Black education has been continuously under the spotlight since the 1994 elections. Much has been done since then to improve Black education. The implementation of the Constitutional Law (108/1996) on 04/02/1997 together with the South African Schools Act (84/1996) has changed education in South Africa drastically because of the emphasis that is placed on human rights, democracy and equality (Viljoen, 1999: 30). Two major implications are that education may no longer discriminate against race and that the focus on the upliftment of the education of previously disadvantaged groups has become a priority (Bray, 1998: 81).

The study will now focus more specifically on each of the following environmental factors: educational background, medium of instruction at secondary level, and exposure to reading facilities. All of these factors may play a role in the conceptual awareness and comprehension ability of previously disadvantaged ESL students in South Africa.

4.4.2 Educational background

A number of important educational initiatives have surfaced since the 1970's which, though relatively small and insignificant at first, gained momentum and helped to bring the country to the brink of a major restructuring of its educational system. A major step was the rejection of Afrikaans as a medium of instruction in traditionally Black schools in favour of English in 1976. The acquisition of

English skills was perceived as an important factor on the path to educational, economic and even political liberation (Carlson, 1992: 9).

The Molteno Project was launched by the Institute for the Study of English in Africa (ISEA) at Rhodes University in 1970 to investigate and to evaluate the teaching of English in Black Primary Schools. According to the Molteno Project report issued in 1974, Black children failed to acquire even rudimentary competence in functional English. Primary school teachers' English incompetence was identified as a major contributory cause of failure. The findings of this report concluded that the absence of a firm foundation of reading skills in the mother tongue lies at the heart of the problem of failure to learn concepts in English (Carlson, 1992: 10).

This report was issued in 1974. However, today disadvantaged ESL students who enrol for tertiary studies come from a much improved educational system compared to that of the 1970's, but the language problem has not yet been sufficiently solved.

Students who enrol at Rustenburg College are mostly disadvantaged ESL students who come from schools in rural areas. These students are mostly taught by teachers whose second language is English and whose English proficiency is not up to standard (cf. 4.2). Because of this, students are not encouraged to enquire about concepts in the target language. Adamson (1993) states that the ability to analyse and judge academic material critically becomes the most difficult task for many disadvantaged ESL students, because of this shortcoming in their educational upbringing.

4.4.3 English as medium of instruction in secondary school classrooms

Guthrie et al. (1991: 205) state that in an instructional context teachers are responsible for orchestrating their interactions with students. Teachers determine

the rules for questioning and answering, rules for turn-taking, the types of questions asked and which behaviour is allowed. According to Young (1991: 10), a teacher must constantly vary learning behaviour that builds understanding of concepts. Ways to develop behaviour that demonstrate understanding and ways a learner can apply that knowledge with ever-increasing complexity need to be planned for consciously. In order to do this planning, teachers must know what level of proficiency is required from their learners (Lambani, 2001: 55). Afolayan (1984: 15) and Miller (1989: 56) both assert that understanding cannot be directly acquired from experience only; it must involve knowledge construction on the part of the learner. This construction of knowledge, based on more than just the information provided in a task or a situation, usually requires help from the teacher. It is clear that teachers need to be educated about the role of language in learning.

Amuzu (1992: 132) states that a poor command of the language of instruction obstructs clear comprehension of concepts on the part of the students. He also adds that, because of this barrier, teachers find it easier to resort to the mother tongue when explaining or teaching certain concepts. This in itself can become a laborious task since in certain subjects like Mathematics, Science and even Commerce, many of the English concepts do not exist in the mother tongue (Kilfoil, 1999: 52). Thus, for students who are (in the first instance) unfamiliar with the concept, this strategy only leads to complication and misinterpretation.

Amuzu (1992: 130-131) points out that investigations into Black schools in the former Bophuthatswana revealed that candidates who entered the Colleges of Education to train for teaching were, in general, people who failed to get matriculation exemption to enrol at a university. They were often people with low grades in matriculation examinations. In addition, quite a number of them were not genuinely interested in teaching as a profession – it was basically a last resort. In this regard, Amuzu (1992: 133 – 134) states that insufficient motivation and inadequate training on the part of the teacher can be considered as serious

handicaps in a teaching career because the learning process of the students is impeded. Because of inadequate motivation and training and poor language proficiency on the part of the teacher, students' language proficiency can neither be improved, nor can their conceptual acquisition be developed.

The conclusion that can be drawn in this regard is that if students' experience regarding conceptual and language learning is deficient, then the entire learning process is obstructed and consequently they struggle to cope with the demands of tertiary study. This conclusion is echoed by Grobler (1991: 29), who states that the way in which our students have been taught and their experiences of language in general affect their ability to deal with the level of work at tertiary level.

4.4.4 Exposure to English reading material

Reading encourages personal development and value clarification. It expands interests, abilities and vocabularies. To enjoy these advantages offered by reading optimally, a child has to be exposed to books at a young age. This includes regular visits to a library. According to Saunders (1991: 14), the average English First Language student begins to read fluently and for pleasure at about the age of 9 ½ to 10 years, provided that he or she is given the right environment (a good school with a well-equipped library and competent teachers). He adds that it is from this point onwards that education can really begin.

Exposure to English reading material is important as far as Second Language Acquisition is concerned. Most students from a disadvantaged background use English as a second language.

In South Africa most rural areas and townships do not have libraries at all (cf. Saunders, 1991: 14; HSRC, 1998). School libraries in these areas are often non-existent or very poorly equipped. Not being able to read English fluently because of insufficient facilities is a huge obstruction for matriculated students in a

country where English is accepted as medium of instruction. The result is that students' language proficiency, reading skills and conceptual awareness are inadequate and consequently they fall back on desperate expedients, namely, regurgitation of what they hear in lectures, the "mugging up" of summaries and learning passages by heart (Saunders, 1991: 14).

Reading is a habit that must be formed as early as possible in a child's education to produce a student who is truly qualified to enrol at a tertiary institution. Saunders (1991: 14) sums it up as follows: "Reading is the thing. There is no time (in education) too precious to spend on its mastery".

4.5 CONCLUSION

This chapter has discussed external factors which may play a role regarding the disadvantaged ESL student's ability to comprehend concepts and to cope successfully with tertiary study.

All these factors form part of the background from which the previously disadvantaged student comes. The student cannot be separated from his background and, therefore, it is of paramount importance that lecturers are sensitive to differences in the linguistic, economic, social, intellectual and cultural background of their students, and that they see them as individuals with differing personal needs, learning objectives and learning styles. According to Kostelnik (1993: 73 – 77), the teacher has to view learners within the contexts of their families, culture, communities, past experience and current circumstances to create age appropriate, as well as individually appropriate, learning environments. Barnard (1997: 79 – 84) also states that teachers should be especially aware of learners' knowledge and ideas when teaching learners from deprived backgrounds.

The remaining chapters of this dissertation will be devoted to the empirical study. In chapter five the method of research will be explained.

CHAPTER 5

METHOD OF RESEARCH

5.1 INTRODUCTION

As mentioned in the introductory chapter, the aim of the study is to investigate students' knowledge of concepts and then to propose practical strategies which can be implemented in the Introductory Communication course at a College to improve the conceptual knowledge and awareness of previously disadvantaged ESL students. This chapter describes the method of research.

5.2 EMPIRICAL STUDY

5.2.1 Design of study

The empirical study consists of a one shot cross-sectional survey.

5.2.2 Subjects

The subjects for this study are 73 students who have enrolled for the Introductory N4 level course at Rustenburg College. They all come from previously disadvantaged backgrounds and speak English as a second language.

Of these students, 12% are males and 78% are females. The average age of the participants is 20 years. It must be pointed out that 38.35% of these students come from secondary schools in the rural areas surrounding Rustenburg. 65.75% of them have passed English Second Language at Higher Grade level, and 9.58% have passed it at Standard Grade level in Grade 12. 54.79% of these students matriculated in November 2001.

5.2.3 Instrumentation

A test which tests the subjects' conceptual knowledge in three subject fields has been designed (cf. Appendix A). The test comprises five sections. Sections A and E focus on the subjects' background. Sections B and C test their conceptual knowledge, while section D focuses on their previous experience with the concepts. Each of the sections mentioned above is outlined in more detail in 5.2.4.

To meet the research objective, the researcher has compiled a list of 53 concepts from three subjects taken by all Introductory students: twelve concepts come from the subject Introductory Communication, twenty one concepts are taken from Introductory Computer Practice, and twenty concepts come from Introductory Entrepreneurship. The concepts have been selected by means of an analysis of the prescribed texts of each subject, and the most frequently used concepts have been selected. The centrality of each concept has been validated by the lecturer teaching the specific subject.

The concepts for the three respective subjects have been categorized under the headings *Introductory Communication, Introductory Computer Practice* and *Introductory Entrepreneurship*. The concepts are:

Introductory Communication:
Communication, time management, constructive activities, concise, emphasize, strategy, memorandum, notice, minutes, conference, verbal, values.

Introductory Computer Practice:
Edit, insert, format, view, file, toolbar, icon, delete, italics, database, mouse, stiffy, virus, hardware, software, spreadsheet, word processing, advantage, disadvantage, input device, e-mail.

Introductory Entrepreneurship

Entrepreneur, economy, cash flow, capital, interest, corporation, infrastructure, VAT, retailer, brand, balance sheet, budget, insurance, security, cheque, traveller's cheque, shoplifting, invoice, statement, insolvent.

5.2.4 Test design

In Section A the subjects are required to answer questions on relevant background details. It focuses on certain socio-economic, socio-cultural and socio-linguistic factors. The students have to supply the following information:

- Their age
- Geographical location, i.e. do they live in a rural, semi-urban or urban area
- The year in which they have matriculated
- The mark they have obtained for English in Grade 12
- The subjects they have passed in Grade 12 and the levels on which these have been passed
- Which subjects have been taught to them through the medium of English
- Which course they are enrolled for at the College
- Their cultural orientation and mother tongue
- To which other languages they are exposed in the area where they live
- Previous attendance of tertiary institutions

In Section B the subjects first have to make a sentence of their own with each concept so that its meaning becomes clear. This is referred to as Test 1 (T1) in the study. The same concepts are then given in Section C, but in a different order. The students now have to explain or define each concept using their own words. This section is referred to as Test 2 (T2) in the study. No dictionaries are allowed.

Section D consists of a list of general questions, focusing on the students' previous experience and familiarity with the selected list of concepts. They have

to indicate which of the concepts asked in Test 1 and Test 2 they have never encountered before enrolling at the college. They also have to indicate which of these concepts exist in their mother tongue. Finally they have to indicate if there are any other concepts in the three subjects apart from those asked in Tests 1 and 2, with which they are unfamiliar.

Section E also focuses on background details. The students have to indicate whether they have electricity at home, whether they have access to English reading materials and to electronic media such as television, radio and the Internet. They also have to indicate to what extent they are exposed to spoken English by saying to which groups of people they speak only English. Finally they have to tick off the most important reason for choosing to study a specific course at the College.

5.2.5 Procedure

The test has been administered during official class time under the supervision of the researcher.

5.2.6 Analysis

Only percentages and averages have been used as a means to analyse the test results. The tests have been marked by three markers. The tests have first been marked by the researcher in terms of the correctness of each concept. This has been done on a separate mark sheet (Appendix B).

For validation purposes, the tests have also been marked by two experienced lecturers according to memorandums which have been supplied by the lecturer teaching the actual subject. One marker has marked the first 36 tests and the other marked the remaining 37 tests. The markers have been briefed beforehand on the marking procedure and requirements in order to avoid discrepancies. The

markers have been told that the main concern is to see whether the subjects understand the essence of the concept within the context of the subject.

The marking of Test 1 allows for more subjective marking, as the subjects have to make their own sentences with the concepts. Thus markers rely more on their own interpretation of whether the meaning of a concept is made clear enough in the sentence. T2 requires more specific factual formulation of the concepts from the students. The results have been marked and interpreted as follows:

The various concepts are tested twice. In Section B (Test 1) the subjects have to use each concept in a sentence of their own so that its meaning is made clear. In Section C (Test 2) they have to define each concept in their own words, without the help of a dictionary. The final results based on the results of both Test 1 and Test 2 are tabulated, indicating whether a concept is fully understood, partly understood or not understood at all.

For each concept the following interpretation procedure has been used:

- A concept is only interpreted as being *FULLY UNDERSTOOD* if the student has it right in both T1 and T2.
- If the student has it correct in either T1 or T2, the concept is interpreted as being *PARTLY UNDERSTOOD.*
- If the student has it wrong in both tests, it is interpreted as *NOT UNDERSTOOD.*

5.2.7 The marking procedure

The results of the markers have been compared for both Test 1 and Test 2 and the result for each concept has been calculated as follows:

- If marker one indicates that the student has fully understood the concept and marker two also indicates that the concept is fully understood the result for that particular concept is presented as *FULLY UNDERSTOOD*.

- If marker one indicates that the student has partly understood the concept and marker two indicates that the concept is fully understood (or vice versa) the result for that particular concept is presented as *PARTLY UNDERSTOOD*.

- If marker one indicates that the student has partly understood the concept and marker two also indicates that the concept is partly understood the result for that particular concept is presented as *PARTLY UNDERSTOOD*.

- If both markers indicate that the concept has not been understood, the result for that particular concept is presented as *NOT UNDERSTOOD*.

- If the two markers do not agree on whether the concept has been understood by the student or not, the result for that particular concept is regarded as *INVALID*. These results are presented under the column *DISAGREE*.

- If a student fails to answer the concept twice in the survey, the result is indicated as *NOT ANSWERED*.

These combined results for both Section B and C have been tabulated separately for each of the three subjects.

After this initial analysis the results of the two types of tests have been compared. Students' ability to make a meaningful sentence with a concept (T1) has been compared to their ability to define a concept in their own words (T2). This comparison has been done for each individual subject. Totals have been obtained and calculated in terms of percentages and then compared in table format.

The results for Section D (Test 3) have been tabulated separately for each of the three subjects and presented as totals and as percentages. Finally, some of the background factors requested have been analysed to obtain an impression of the subjects' background. These factors are analysed to put the participating students' background into perspective. The factors are not discussed in detail as it is not the intention of this study to draw direct correlations between the students' background and their conceptual knowledge.

5.3 CONCLUSION

This chapter describes the steps followed in the study to report whether the students are familiar with some of the most important concepts in their fields of study.

In chapter six the test results are discussed in detail.